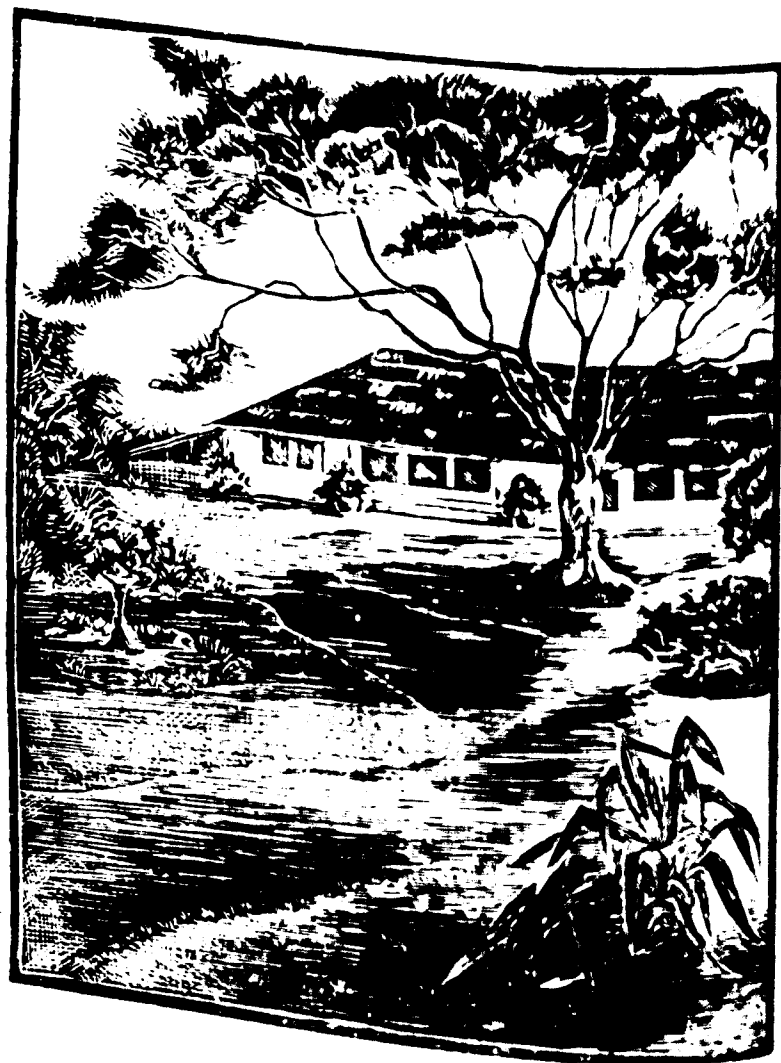




71
• N43
904

THE GARDEN
IN THE PLAINS



AGNES W. HARLER

THE
GARDEN IN THE
PLAINS



HUMPHREY MILFORD
OXFORD UNIVERSITY PRESS

OXFORD UNIVERSITY PRESS
AMEN HOUSE, LONDON, E.C.4
EDINBURGH GLASGOW MELBOURNE
NEW YORK TORONTO CAPETOWN
BOMBAY CALCUTTA MADRAS
HUMPHREY MILFORD
PUBLISHER TO THE
UNIVERSITY

TO
A. E. W. H.
AND
C. R. H.

Acc. no. 894
of 29.11.27

71
N 263



FIRST PUBLISHED, DECEMBER 1941
SECOND EDITION, APRIL 1943

PRINTED IN INDIA
AT THE DIOCESAN PRESS, MADRAS—1943. C9586

PREFACE



THIS book is intended for beginners, especially for those women in India who are anxious to make a hobby of their gardens. As a beginner it struck me that there was room for a book somewhere between the light and chatty manual and the serious standard work, with its massed information and complete lists of plants. The light and chatty books make delightful reading and are invaluable for stimulating enthusiasm, but they leave out so much that one wants to know, and many 'hows' and 'whys' go unanswered. On the other hand, the standard books contain full and valuable information. Much of it, however, proves indigestible to a beginner, and it is often difficult to sift one's elementary requirements from the mass of facts presented.

The Garden in the Plains is an attempt to strike an intermediate note. The lists of plants are by no means exhaustive and are selections only, but the subject-matter has been arranged under many headings and sub-headings, so that information can be easily found, or skipped, as desired.

The regrouping of plants by the systematic botanists has sometimes made it difficult for me to decide which of several Latin names I should use. I have compromised by putting what seem to be the more widely known names first, with the alternatives after them in brackets.

The standard works of Firminger, Macmillan and Percy Lancaster have been invariably used for reference, whilst the Curators and Assistants of Government Gardens in India, Burma and Peradeniya, Ceylon, have been ever ready to give information by letter or

[ix]

PREFACE

to devote hours of their time to showing me round their charges during my visits.

My thanks are due to Mrs J. Robinson for the frontispiece, and to Mr W. Hanby who supplied the information about levelling ground and preparing a tennis court. I would also like to thank the staff of the Oxford University Press for their assistance over technical and other matters connected with the preparation of this book for the press.

Munnar, 1941

A. W. H.

NOTE TO THE SECOND EDITION

I HAVE taken advantage of the early demand for a second edition to correct the few positive errors which have come to light. I would like to thank those critics who pointed them out and those readers who have so helpfully made suggestions for the inclusion of new matter. In addition to new sections on Hydroponics, Moonlight Gardens, Seaside Gardens and Terraces, minor changes have been made throughout the text and it is hoped that the index will be more useful than before.

Calcutta, 1943

A. W. H.

[x]

CONTENTS

PART I. THE GARDEN IN GENERAL

I THE GARDEN YOU FIND AND THE GARDEN YOU MAKE 3

TAKING OVER AN OLD GARDEN — LAYING OUT A NEW GARDEN — Essential features in a garden — Designing the garden — Starting work — Choosing and buying plants — CULTIVATION AND WATERING — GARDENING BOOKS — PLANTS FOR A MOONLIGHT GARDEN

II THE FORMAL GARDEN AND GARDEN ORNAMENTS 25

The general design — GARDEN ORNAMENTS — Paved paths — Home-made paving and brick paths — Steps — Bird baths — Sundials — Bird tables — Seats — Paved pools — Ornamental vases and tubs — Low walls — Terraces — Pergolas — Arches — Summer houses

PART II. GARDENING OPERATIONS

III SOIL AND MANURING 53

SOIL MANAGEMENT — Drainage — Conserving moisture — The food a plant needs — Soil deficiencies — BULK MANURES — Dung — Storing cattle or stable manure — Liquid manure — Compost — A gardener's compost pit — How much bulk manure to add — Green manure for the vegetable garden — ARTIFICIAL FERTILIZERS — Lime — Hydroponics

IV PLANT PROPAGATION 72

PROPAGATION BY SEED — Collecting and storing seed — Germination of seed — Sowing seeds — Nursery beds — Seed boxes — Care of seedlings — Transplanting — PROPAGATION BY CUTTINGS — How to prepare cuttings — How to plant — When to plant

[xi]

27 JUL 1943

CONTENTS

— PROPAGATION ALLIED TO CUTTINGS — 'Eyes' and leaves — Division of rootstock — PROPAGATION BY LAYERS — How layers are made — Gootee or mar-cottage — PROPAGATION BY GRAFTING — Whip, saddle and cleft grafting — Crown grafting — Inarching or upright stem layering — Budding	
V PRUNING	95
Why pruning is necessary — When to prune — How to prune — Types of pruning	
VI PESTS AND DISEASES	99
PREVENTIVE MEASURES — How to keep plants healthy — ANIMAL PESTS — INSECT PESTS — The life cycle of an insect — INSECTS AND INSECTICIDES — Bit-ing insects — Grubs — Crickets — Piercing and suck-ing insects — Borers — Ants — Small pests other than insects — Fumigants — FUNGI, FUNGUS DISEASES, ETC. — Fungus sprays and washes	
PART III. TREES, SHRUBS AND PERMANENT GARDEN FEATURES	
VII TREES	117
Planting trees — Care of trees — Flowering trees for the garden — Colourful jungle trees — Ornamental foliage trees — Medium to large densely shady trees — Large trees with lighter foliage — Very big trees — A selection of trees for avenues — Unusual trees — Beautifying waste land	
VIII SHRUBS AND SHRUBBERIES	135
Planting and transplanting — Shrubbery formation and group planting — Doctoring old shrubs — Pruning shrubs — Foliage shrubs — Flowering shrubs — (a) for the hot weather and rains — (b) for the cold weather — (c) that like semi-shade — (d) that thrive in poor soil — Other shrubbery plants for humid districts	
IX CLIMBERS AND CREEPERS	155
Supports for climbers — Care of climbers — Foliage climbers and creepers — Light flowering climbers for screens — Climbers for arches or pergolas —	
[xii]	

CONTENTS

Heavy climbers for trees or strong pergolas — Flowering climbers that like semi-shade — Climbers trained as shrubs — Climbers that flower in the cold weather — Annual climbers — A climber for odd corners — Bougainvilleas — Ways of growing bougainvilleas	
X PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS	172
PALMS — Tall palms — Small palms — Palms in pots — Palms and allied plants that like moisture — Cycas — ORNAMENTAL GRASSES — Bamboos — Tall grasses — Small grasses — A FEW SUCCULENT PLANTS — Tall succulents — Smaller succulents — Succu-lents for pot work	
XI GRASS AND LAWNS	182
Drainage — Levelling — Planting grass — Cutting new lawns — Pale or yellow lawns — Fertilizers for grass — Top dressing a lawn — Watering a lawn — Weeds — Worm casts — 'Fairy rings' — A grass tennis court — Measurements of some games lawns	
XII HEDGES	195
Barriers — Demarcation hedges — Wind breaks — Planting a hedge — Clipping hedges — Small edging plants	
XIII FERNERIES AND POT PLANTS	201
Propagation of ferns — Potting ferns and other fern-house plants — How to prepare pots or hang-ing baskets — Home-made hanging baskets — Watering ferns and pot plants — Types of ferneries — Situation and structure of a fern-house — PLANTS FOR A FERNERY	
XIV ROCKERIES	216
Making a rockery — Types of rockeries — Care of rockery plants — SUGGESTIONS FOR ROCKERY PLANTS	
XV WATER GARDENS AND MARSHY GROUND	224
Mosquitoes — Fish for a pond — The ideal water garden and a compromise — Formal treatment of a 'tank' — Landscape effects — Aquatic plants —	
[xiii]	

CONTENTS

Planting water lilies — A paved pool — Stocking a pool — Marshy ground — The seaside garden —
A LIST OF PLANTS

PART IV. FLOWERS

xvi	THE ANNUAL FLOWER GARDEN ..	245
	Flower borders and beds — Preparing flower beds — Sowing seed — Flowers out in beds — Cold weather annuals — Everlasting flowers — Hot weather annuals — Annuals for districts with no marked cold weather — Annuals suitable for pot work — A few perennials	
xvii	LILY BULBS AND TUBERS ..	271
	Bulbs, stem-tubers and root-tubers — Soil and propagation — Bulbs specially suited to pot work — Outdoor lilies — Storing bulbs and tubers — DAHLIAS	
xviii	ROSES ..	282
	THE CLASSIFICATION OF ROSES — What to cultivate on the plains — CULTIVATION, MANURING AND PLANTING — Soils and manures — Planting — Imported roses — Wintering — Watering — Disbudding — THE PRUNING OF ROSES — When to prune — How to prune — THE PROPAGATION OF ROSES — Cuttings — Layers — Budding — PESTS AND DISEASES — Insects — Fungus diseases — THE ROSE GARDEN — Its layout — Standard roses — 'Pegging down' — Hedges — Pot planting — A SHORT SELECTION OF ROSES	
xix	CHRYSANTHEMUMS ..	314
	PROPAGATION — Seed — Division — Cuttings — CHRYSANTHEMUMS IN POTS — Potting programme — Care of potted plants — DISBUDDING — Selecting buds for flowering — Stopping — DIFFERENT FORMS — Exhibition flowers — The Decorative class — Bedding plants — Cascade chrysanthemums — Notes on some varieties — PESTS AND DISEASES — Insects — Fungus diseases — Leaf distortion — A SELECTION OF CHRYSANTHEMUMS	

[xiv]

CONTENTS

xx	CANNAS ..	338
	Preparing the beds — Planting — Watering and after-treatment — Resting and re-planting — Cannas in pots — Diseases — Types of cannas — A SELECTION OF CANNAS	
xxi	ORCHIDS ..	343
	Where orchids grow — How orchids grow — Temperature, sun and shade — Propagation — Culture of epiphytic orchids — Terrestrial orchids — Watering orchids — A SELECTION OF ATTRACTIVE ORCHIDS	
PART V. VEGETABLES AND FRUITS		
xxii	VEGETABLES ..	353
	Choosing the site and preparing the beds — Rotation of crops — Seeds — Planting — Staking tall or climbing plants — Blanching — COOL SEASON VEGETABLES — Herbs — Mushrooms — COUNTRY VEGETABLES — Condiments	
xxiii	FRUITS ..	373
	Site and soil — Pruning — Manuring — Fruit failing to set — Pests and diseases — A SELECTION OF FRUITS — Low-growing fruits — Small trees and climbers — Medium to large trees	
PART VI. MISCELLANEOUS		
xxiv	FROM THE GARDEN TO YOUR TABLE ..	395
	RECIPES	
xxv	CUT FLOWERS FROM TREES, SHRUBS AND CREEPERS ..	405
	Flower arrangements and vases — How to keep flowers fresh — Flowers from trees, shrubs and creepers	
xxvi	BIRDS AND THE GARDEN ..	411
xxvii	GARDEN IMPLEMENTS ..	416
	A list for easy working — Special tools for special occasions — Items for the garden store shelf	
xxviii	A GARDENER'S CALENDAR ..	422
	INDEX ..	427

[xv]

*'Let no one think that real gardening is a
bucolic and meditative occupation. It is an
insatiable passion, like everything else to
which a man gives his heart.'*—KAREL CAPEK

PART ONE

THE GARDEN IN GENERAL



Chapter i

THE GARDEN YOU FIND
AND THE GARDEN YOU MAKE



‘All the sweet cups to which the bees resort,
With plots of grass, and leafier walks between.’

Leigh Hunt : *A Garden and Summer House*



TAKING OVER AN OLD GARDEN—LAYING OUT A NEW GARDEN—
Essential features in a garden—Designing the garden—Starting
work—Choosing and buying plants—CULTIVATION AND WATER-
ING—GARDENING BOOKS—PLANTS FOR A MOONLIGHT GARDEN

GARDENING in the plains of India has many advantages over gardening in Europe. It is true that borders of mixed flowers often refuse to bloom all together or to give the effect of a herbaceous border as planned, and many well-known favourites will not thrive in the plains. On the other hand, trees and shrubs grow quickly enough in most parts of India to give one a chance of playing with land in a way quite impossible in a colder climate where big plants grow slowly. Indian gardens are often spacious and provide a large canvas to work upon. The flowering trees, shrubs and creepers are so brilliant and varied that it is possible to experiment with broad colour effects and, what is more, to have a reasonable expectation of seeing the results of one's work. In districts where there is a marked cool season one can make the best of both worlds by growing masses of annuals, in contrast to the flaming tropical flowers of the hot months.

THE GARDEN IN THE PLAINS

This chapter deals with the adaptation of an old garden and with the laying out of a new compound on an empty site. For actual details regarding the methods of laying a lawn, for digging pits for trees, propagation, the choice of plants, and so on, it is necessary to refer to later chapters dealing with these subjects.

TAKING OVER AN OLD GARDEN

You will be lucky if you find yourself in a cool old bungalow with a well-established garden. Many old compounds have fine trees and intriguing leafy corners, but they have often grown haphazardly, and a new-comer may feel inclined to uproot the whole place and start all over again in an attempt to bring about some sort of design. Unless the garden is overcrowded, however, good trees and shrubs should never be sacrificed, for they are invaluable in providing a setting for any additions you may make in the way of new lawns, a pergola or a summer house. It may be necessary to do away with a few sickly or untidily rampant plants, but the best existing features should be left where they are to form a background for new schemes.

An instinct for light and air makes people want to cut down trees for some distance round a house, but unless there seems to be immediate danger from them, such as cankered branches, or general stuffiness, wait until the hot weather and see how they appear then. Some may burst into unexpected beauty with flowers, whilst others will provide welcome shade and protection.

If the house has been empty for some time and the garden neglected, it will seem a depressing place with its weedy paths and rank grass, bringing a thought of snakes. One of the first steps will be to dig a pit somewhere in the background and throw into it all

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

the weeds that are collected and any cut grass, as these will form the basis of compost and will provide manure for the garden eventually. (See the sections on Compost in the chapter 'Soil and Manuring'.) Once the grass has been cut, the edges of the lawn made neat and the paths weeded, the outlook will be more cheerful.

Many shrubs may appear grey and hidebound with few leaves or flowers, and these should be manured and doctored as described in the chapter 'Shrubs and Shrubberies'. All shrubs should be 'cleaned' by cutting out dead wood and twiggy growth, and those that can stand it judiciously pruned about January, with the exception of those that flower in the cold season which can be pruned when they have finished flowering. In the rains it may be possible to move some of the smaller shrubs to a better situation, but it is unwise to lift big, old plants for they seldom recover, or do so very slowly. Should there be an overcrowded shrubbery, it might be advisable to remove a few plants to give elbow-room to those that remain. Do not uproot any shrubs straight away, however, until the flowering season in the hot months shows which plants are the least attractive and can be spared most.

Climbers will probably need attention. Some can stand drastic pruning whilst others will only bear a gentle cutting of dead wood. Grass and weeds at the foot of a climber should be pulled up, and a heaped basket of rotted cattle manure forked into the soil in the early rains.

Before pruning shrubs or climbers try to identify them, and find out whether or no they can stand drastic cutting. This is particularly important with regard to delicate types that do not respond to the knife. The chapter on 'Pruning', and those on

THE GARDEN IN THE PLAINS

'Shrubs and Shrubberies' and 'Climbers and Creepers', will be of help in this connexion.

Leave the re-potting of ferns, and pot plants generally, until the early rains, when the plants should be divided and potted in fresh compost as described in the chapter 'Ferneries and Pot Plants'. At the same time any worn-out specimens of coleus, dracaena or iresine can be renewed by putting down cuttings.

Cannas may be improved straight away by forking their beds and turning in some cattle manure. Just before the rains the beds should be emptied, thoroughly well dug and manured, and the cannas re-planted with the first rain after dividing the clumps. On taking over an old garden it often pays to re-plant the cannas in new beds, for they will benefit greatly from the fresh soil. The old beds can be grassed over, or manured and used for annual flowers later. (See the chapter on 'Cannas'.)

Should the lawn look thin and yellow, a top dressing of soil, to which some nitrogenous manure has been added, will benefit it greatly, applied just before the first rains,¹ or late in August. If it is not practicable to top-dress with soil, weed the lawn thoroughly and water it once with a solution of sulphate of ammonia. The chapter on 'Grass and Lawns' gives details of suitable manures and the proportions to use.

If the rainfall of your district is heavy or the garden has been neglected for some years, flower and vegetable beds will benefit from a sprinkling of lime turned in about July, ahead of the manuring and planting seasons.

Metal supports for climbers will probably be better for a coat of green paint, a paved walk or stone garden ornament may need scraping and cleaning, and any rustic woodwork will most likely require renewing.

¹ See Chapter xxviii, 'A Gardener's Calendar'.

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

Many old gardens contain 'tanks', and if yours does not supply drinking water consider the idea of converting it into a water garden. There is a chapter on 'Water Gardens and Marshy Ground' that will prove helpful.

Any new building work, such as making a pergola or laying crazy paving, is best done in the dry season, while the making of new lawns or the moving of plants is better carried out in the early rains.

The garden of a 'bird of passage'

Bungalows rented by Government officials sometimes suffer from having new occupants every six months or so. The garden is perhaps neglected through lack of interest and is often depressingly dull. Such a compound possibly shows a lawn run to seed, a tattered hedge with gaps, one or two good trees and a few forlorn shrubs. If there happens to be a diligent *mali* or a caretaker left in charge while the bungalow is empty, he may line the paths with small white stones or bricks. He loves many little round flower beds edged with a dwarf red foliage plant and filled with degenerate marigolds or magenta cocks-combs.

The attitude of a 'bird of passage' is understandable in one way, but in another it seems absurd to suffer ugly surroundings even for a few months if they can be improved. Grass can be cut and weeded, the hedge cleaned and trimmed, and if the period of occupation coincides with the rainy season, cuttings can be put down to fill in the gaps. Shrubs may be doctored so that they look healthy again, canna beds dug and manured, and flowers sown in the beds near the house. It takes no great outlay of money and trouble to re-pot existing pot plants or to care for trees and shrubs.

THE GARDEN IN THE PLAINS

Apart from a general tidy up, it is as well to avoid adding many new features to the garden if you will only be living in the bungalow a short time. Instead, concentrate upon growing annual flowers really well. These give a quick return for trouble and expenditure, and are always spectacular if massed boldly. If the existing flower beds are small and the general effect spotty, grass them over and cut new ones on broader lines.

If you are interested enough to plant any new shrubs, choose hardy types that will thrive in comparatively poor soil, as it is unlikely that much care or manure will be given them after you leave. (See the chapter on 'Shrubs and Shrubberies'.)

LAYING OUT A NEW GARDEN

It is a comparatively simple matter to think out plans for a garden provided there is some grass already planted and a few trees, for existing features influence a new design and ideas assemble easily with the green setting before the eyes. On the other hand, a feeling of utter helplessness arises on first seeing the bare stretch of sun-baked earth that surrounds a brand new bungalow. It seems impossible that any plants will ever grow or that there will ever be any rest from the glare all round; but once again the comforting thought will come that in India there is a quick return for trouble and expenditure. So many gardens have 'just grow'd' indiscriminately that it is pleasant to know that you can make most of your gardening dreams materialize without having to adapt the previous work of other people.

The first thing to do is to draw a rough plan showing the outline and extent of the compound, an oblong representing the house and its position as regards aspect. You then have to decide exactly

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE
what you want to do and the extent you can afford to open up.

In towns, gardens are generally small and there is often no room for fruit or vegetables or even a big lawn, but there is usually space enough for flower beds, some grass, a few shrubs and perhaps a tennis court. Even if you only expect to be in the bungalow a short time, the following work should be put in hand.

Essential features in a garden

(1) *A drive and a few garden paths*

There must be a road to the garage and a turning place for the car. Sometimes the road encircles the bungalow, but although this is convenient it is also ugly because it necessitates a wide expanse of gravel under the windows. A car road can lead straight to a garage, provided there is enough space to back into for turning and the garage is near enough to the bungalow to avoid a long walk in the rainy season.

In a large garden there may be room for an avenue of trees lining the road to the garage. These should be planted far enough back from the sides of the road to avoid heavy drip from the leaves onto the running surface. The width of the average house drive is from 8 to 12 feet.

Paths are best cut fairly wide, say about 4 to 5 feet, so that two people can walk abreast comfortably. The material used as a surface varies with the locality, good gravel or a foundation of broken brick covered with brick dust or *soorkee* being popular.

In places where the ground is naturally hard and firm, paths can be founded upon ordinary soil, with a top dressing of fine gravel spread over the whole area, and the path watered and rolled. In districts

THE GARDEN IN THE PLAINS

where the earth is soft and silty, much used paths and motor roads have to be laid with a firm foundation to stand up to the monsoon.

To make a motor road or path founded on brick or gravel, the site must be defined with pegs and string and the area excavated to a depth of 2 or 3 inches. The excavation is filled to ground level with a hard core of heavy gravel or broken brick which is rammed down firmly. A layer of blinding composed of fine gravel or coarse brick dust is then pushed into the chinks in the hard core and the path rolled. Finally a surface dressing of the same material as the blinding is spread, well watered and rolled.

Paths should be a little higher in the centre than at the sides, for drainage purposes, but the rise must be so slight that it is barely perceptible. If the slope is too great the surface dressing is liable to be washed off the path in the rains.

Turf paths between banks of shrubs or flowers are most attractive, but walking upon them constantly wears them thin down the centre. For paved paths see the chapter on 'The Formal Garden and Garden Ornaments'.

(2) *A good hedge round the garden*

If hedges are to function as a protection for the property they must be thorny and impenetrable or, if thornless, protected outside by a wire fence. They need not be thorny if used for demarcation purposes, screening the vegetable garden, hiding a well, and so on.

It may be necessary to grow a windbelt, say a line of bamboos or some quick-growing trees, outside the compound, if the site is likely to be ravaged by strong winds. If you have no control over the land outside, choose a tall-growing hedge plant for the windy side of the garden.

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

(3) *A restful green lawn*

The position of a lawn is largely determined by the layout of the garden in relation to the bungalow, any existing trees, and so on. Usually the obvious place for it is in front of the veranda.

The effect of a lawn should be to give a wide expanse of green, unbroken by small flower beds, unnecessary paths or too many trees and shrubs.

(4) *Shrubs, trees and climbers*

Some hardy shrubs grow very quickly and you will probably get a return from these. If the garden is a small one it saves space to mass the shrubs in a shrubbery as a background, and so leave the lawn quite clear. Large and brilliant shrubs are best grouped in a corner of a big lawn where they can be seen to advantage against the setting of grass.

Trees you plant for posterity, but they will have to be planted some time or other and you might as well earn the credit. Do not cut down a tree till you have considered the matter long and carefully, for any tree is better than none in a bare new garden. Trees on the boundary of the compound will often serve as stands for rampant climbers, even if they are not particularly beautiful in themselves.

Light, spreading climbers grown on wire mesh supports form effective screens for hiding a potting shed, the vegetable garden, or any other odd place that requires screening. Other fairly light climbers are useful for covering arches or twining up pillars, whilst heavier types need a strong support such as a pergola.

(5) *A few flower beds or borders*

Flower beds and borders are easier to manage if they are concentrated together, preferably near the house or in the formal garden if there is one. An

THE GARDEN IN THE PLAINS

open, sunny situation away from trees is essential although shade from the house in the late afternoon does no harm.

(6) *A plot in which to grow vegetables and a few fruit trees*

The vegetable garden is best out of sight of the bungalow veranda and drawing-room windows, but at the same time it should be near enough to the house to be under supervision so that vegetables are not stolen. The same applies to an orchard.

If both fruit and vegetables are to be grown in the same plot, concentrate the vegetables in the centre with a broad path round the group of beds, and plant the fruit trees at a distance between the path and the boundary. The broad path is not a waste of space as it serves to protect the vegetables from shade and the root competition of the fully grown trees. Only small-growing fruit trees can be grown within a vegetable garden. Medium and large trees, such as the litchi, mango and the like, must be planted quite by themselves, and are therefore seldom grown by the ordinary householder. If there is enough space grow all fruit in a separate orchard.

There should be water available close to the vegetable garden.

(7) *Compost pits*

Every garden should have its compost pit to ensure a good supply of organic matter as manure. Some plants, cannas for instance, seem to prefer cattle manure, but compost is excellent for most plants and a good home-made supply will cut down the expenditure on manure. (See the sections on 'Compost' in the chapter 'Soil and Manuring'.)

It is advisable to dig at least two pits so that there will be mature compost at hand at the right seasons.

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

The pits should be at the back of the vegetable garden or near the potting shed.

Designing the garden

There are so many ways of laying out a garden that it is impossible to go into ultimate details when talking about garden design in a general way. Each plot must be laid out on its own merits, according to the site and the space available. The most we can do here is to discuss the broad lines along which to work.

Any trees, or peculiarities of the site in the way of a bank or sloping land, should be taken into account and the garden designed to make the most of these existing features.

Before starting work decide how many features can be included without overcrowding. Is there room for a tennis court as well as a big lawn? Have you enough space for a vegetable garden and a plot for fruit in addition? A well-designed garden has the available land fairly apportioned to each feature, and it is as well not to attempt too much in a small garden. It is a mistake to swallow up the lawn by cutting too many flower beds, or to expect fruit and vegetables to grow when jumbled up together in a cramped space.

When designing a garden there are two main objectives to keep in mind. The first is to create an effect of spaciousness with the illusion of far boundaries, and the second is to plan the garden so that all its features are not on view at a single glance. There is a tremendous fascination about the half-seen in a garden, the hint that there is something more to come just round the corner.

A well-kept sheet of grass helps to bring about a feeling of space more than any other feature, and

THE GARDEN IN THE PLAINS

there should be a restful green lawn even in the smallest garden. If possible avoid rectangular outlines except in a formal plot, for a dead square lawn gives an impression of confined limits. Flowing lines help to enlarge the outlook, and the curves of a shrubbery or a winding path can be most useful in defining the contours of a lawn without encroaching upon the grass.

The skilful placing of dark masses, such as trees, shrubberies, or groups of shrubs, is important in order to give long perspectives and open views. A long curving shrubbery, a shady tree in a corner, or groups of shrubs converging so that the lawn dwindles to a point, are all helpful devices in creating the illusion of distance. Wide, embracing curves are also useful in giving width to a narrow site. Large features such as big trees and massed shrubs are often more suitably placed towards the far end of the compound, so that the eye is led away from the house.

Massed colour effects and concentrated groups of flowering shrubs make for a feeling of spaciousness far more than do small flower beds and single shrubs dotted about all over the garden.

The arrangement of colour is a factor that makes for apparent spaciousness. For instance, a group of blue or mauve-blue flowering shrubs cleverly placed can give an effect of hazy blue distance. Shrubs with strongly coloured flowers in red, flame or orange are best massed together away from the house so as to provide a separate point of emphasis, while the softer intermediate shades can be nearer the bungalow. Both flowers and shrubs look more brilliant against a setting of green grass than they do next to a gravel path.

A winding path can be a very useful and pleasing feature in a garden scheme, but too many paths cut

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE
up the garden into small sections and produce a restless effect.

In large gardens it is interesting to plan contrasting atmospheres, to have a park-like stretch of grass and trees in contrast to a friendly little flower garden nearer to the house, one linked to the other by a pergola holding flowering climbers.

If the lawn is a big one it could hold some groups of brilliant flowering shrubs on a curve, or a few large beds of cannas. A spreading tree suitably placed will throw shadows across the grass and provide welcome shade. A boldly conceived shrubbery makes a good background to the lawn if it has enticing curves that lead one to find a recessed feature such as a shady seat, or a summer house partially veiled by the branches of a small flowering tree.

In small gardens it is not practicable to have strongly contrasting effects, but even so it is possible to produce a feeling of space and the unexpected. Keep the general design simple and avoid overcrowding. Instead of several trees plant one only, and grow all shrubs in a curving shrubbery as a background, with perhaps a climax of some large, spreading shrub at the tip of a pronounced bend. The main body of a small lawn should be kept clear of shrubs and flower beds, but a few beds of annual flowers look attractive surrounding a special feature, such as a sundial in a corner or at one end.

Should there be any cuttings or banks abutting on to the garden site, they can be planted with hardy ferns, creeping herbs or lilies, placed in pockets cut in the bank and filled with suitable soil. For a ferny bank, shade is essential. If the bank has a gentle slope and a sunny situation it can be turfed only, or have a few low-spreading shrubs rambling down the grass, *Allamanda schottii* or a bougainvillea being especially good for the purpose.

THE GARDEN IN THE PLAINS

An important point to consider is the view from the spare bedroom, as in many houses its window look towards the back premises. It is depressing for a visitor to have to gaze out on decaying cabbage stalks or upon servants hanging out washing, so plant a little lawn under the spare room windows with a bed of cannas or a flowering shrub or two.

A moonlight garden

In a climate warm enough for it to be pleasant to linger outdoors at night, a moonlight garden has great charm. Pale yellow or white flowers show up well at night, and since there is a theatrical quality about moonlight in the tropics, these flowers should be given a 'stagey' setting as possible. If there is a pond or tank in the garden, glistening white flowers grouped on its banks will add to the reflection of the moon. An alternative is to group the plants at the end of a stretch of grass where they can be seen easily. The whiteness should begin at ground level, with bedding plants, and meet the sky by way of climbers and tall flowering shrubs. Dark trees or foliage shrubs can provide a sombre background as a foil to the pale flowers.

The bed for the low plants should be quite informal and irregular in outline, holding flowers of different heights grouped as in a herbaceous border. Choose flowers that will not close at night, bushy types for the foreground, tall kinds at the back. The climbers will look more ethereal if they are attached to a wire mesh support or a single pergola placed behind the flower bed. Shrubs with white or yellow blooms can flank the bed and should be grouped so that they merge into the dark background. Blues, pinks and reds look dull at night, so the effect is more spectacular if only plants with white or yellow flowers are used, chosen to bloom together. A few scented plants should be grown in

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE
the background where the source of the fragrance is not apparent straight away.

The early hot weather is a season when there are many attractive plants in flower, and a list of those that look nice in moonlight will be found at the end of this chapter.

Starting work

Once the picture of the garden-to-be is clear in your mind, consult your plan of the compound and draw a sketch showing the exact position of paths, lawns, flower garden, vegetable plot and tennis court.

If you arrive at the beginning of the cold weather there is very little planting that can be done. You might make a few flower beds and sow quick-growing annuals to provide cut flowers, and perhaps prepare one or two beds for late English vegetables. Beyond these few beds the work in the dry weather is literally breaking the ground in preparation for the great planting season in the rains. Patience is needed during this ugly period of preparation when little or no actual planting is done, for a thorough foundation means a fine garden later on and that is worth all the dull groundwork.

At this stage in the garden you must budget for certain expenditure in the way of extra labour and manure.

Having fixed upon the layout that appeals to you most, you mark out on the ground with pegs and string such main features as the motor road, paths, trenches for hedges, and the outline of the lawn. The paths and motor road should be laid first, and when the surface is finished turn the labour force on to the site of the lawn and have the earth hoed up into clods to aerate and dry out before levelling. The trench for the hedge is the next item to tackle

THE GARDEN IN THE PLAINS

and it must be thoroughly dug and some cattle manure turned in. If there is to be a shrubbery, the site for this should be marked out and the ground hoed.

Before digging pits for trees, or for shrubs which are to be grouped upon grass, collect a few sticks or pegs and put a dab of whitewash on the top of each so that they can be seen easily. Place a tall peg on each spot where you propose to plant a tree, and short pegs to represent the shrubs, then stand back and try to visualize the full-grown plants to see if they will appear pleasantly spaced in relation to the rest of the garden. All pits should be prepared as described in the chapters on 'Trees' and 'Shrubs and Shrubberies'.

The beds for annual flowers receive attention next, for although you may be too late for winter blooming you will be in time for hot weather or rain flowers. If the flower beds are to be in a formal garden, decide upon the exact position of permanent features such as a bird bath, a garden seat, paved paths and so on, so that these can be tackled another year when time and money permit.

Pits for fruit trees and the vegetable plot must be dug and manured, and if the vegetable garden is to be screened by a hedge, the trench for this should be prepared.

If there is to be a tennis court, the site should be marked out north-east and south-west, or north and south, and well hoed prior to levelling later.

By the time all this work is finished the season will be approaching for laying down cuttings from your neighbour's garden and for ordering plants. Once the broad outlines have been etched in there will be a busy time of planting trees, shrubs and hedges, and levelling the ground for the lawns, soon to be planted with grass.

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

Before laying down cuttings, prepare well dug nursery beds for them, shaded by a light thatch covering raised a few feet from the ground, which can be removed when necessary. (See the section on 'Nursery beds' in the chapter 'Plant Propagation'.) By taking all possible care the risk of failure is minimized.

It is a good plan to consider what future additions you will make to the garden. At the moment there is more than enough to do, but next year there may be the time to build a fernery or a summer house, to make a rose garden or erect a pergola, and it is as well to know clearly in your mind where each feature will be.

Choosing and buying plants

Trees and shrubs are a great feature of tropical gardening, but from the wide choice available it is difficult to select those that are most suitable. The climate of your district must be considered, whether you want flowering trees or trees for shade, or have room enough for a few of both types, and whether you want to mass your shrubs in a shrubbery or grow them in groups on a corner of the lawn. All these details must be thought out before reckoning the approximate numbers of trees and shrubs that you will need. Before writing lists read the chapters on 'Trees' and 'Shrubs and Shrubberies' to get some idea of flowering periods, whether the plants are deciduous or evergreen, their height and the amount of room they will take up when full-grown, and whether they are quick growers or slow. A look round your district to see what succeeds well locally is a helpful guide to choosing plants.

When buying plants be sure and choose a reliable supplier, as ephemeral nurseries spring up which sometimes deal in inferior stock. All Government horticultural gardens are good, and there are many

THE GARDEN IN THE PLAINS

well-established firms which make a speciality of roses or some other line.

For people living within easy transport of Calcutta it is an excellent plan to become a member of the Agri-Horticultural Society of India. Both Class A and Class B memberships entitle one to buy some plants or seeds at reduced prices and to receive a certain number free—a great advantage if a new garden has to be stocked.

CULTIVATION AND WATERING

When pulling round a neglected garden or making a new one, a most important factor in success is the condition of the soil. For plants to thrive, the soil must be loose and open, not too wet nor too dry. Hints regarding correct cultivation and draining, and also on the conservation of water in the soil during dry periods, are given in the chapter on 'Soil and Manuring'.

In order to get the best out of your plants it is important to understand about watering. If water has penetrated deeply into the earth the soil will remain moist at a depth, even if the surface has dried in the hot sun. Roots of plants are all eager searchers after water and push down towards moisture, so that dryness near the surface does not seriously affect their supply. If the ground has only been watered lightly, penetration below the surface does not take place, the roots remain near the top, and in consequence root growth is shallow. In a drought, then, the ground surface dries and the shallow-rooting plant wilts.

It can be seen, therefore, that superficial watering is almost as bad as no watering, and that it is better to water well every second or third day than to give a light sprinkling daily. A well-drained bed is

THE GARDEN YOU FIND AND THE GARDEN YOU MAKE

important when practising thorough watering, and the surface of the ground should always be forked the morning after a soaking to form a mulch that conserves the moisture. It is a good plan to water half the garden daily so that each part gets one thorough watering every other day. The foregoing applies both to fully grown flowers and young trees or shrubs. Small seedlings just bedded out should, of course, have a daily watering.

In some very dry places where there is practically no rainfall, a daily supply of water may not be available. It is then the practice to carry deep watering to the limit, and the beds are literally flooded once a week. This is often the only feasible method of watering in such districts, but this rather drastic treatment has disadvantages inasmuch as the character of the soil may be changed and, in addition, the earth is apt to cake very hard in the beds. In such cases it is particularly important to fork the surface of all flower, vegetable and shrub beds the morning after flooding.

When flooding a bed it is advisable to take the nozzle off a hose so that the water is available in a steady stream. Lay the end of the hose on a small board or a brick placed on the bed, so that the water will spread evenly instead of boring a hole in the soil.

In order to ensure moisture for the roots of big plants in a permanent border, a number of short tile pipes, about 12 inches long, can be sunk in the earth end-up at regular intervals throughout the bed. Water can be poured through these pipes in a stream which will penetrate to the roots of the plants.

When watering lawns leave the sprinkler playing in one place until the soil is properly saturated, then move it gradually over the lawn so that the whole area is watered thoroughly in sections.

THE GARDEN IN THE PLAINS

and *Olea fragrans* (February and March mainly); the climber *Pergularia odoratissima* or cowslip creeper (hot months).

For the cold weather

Bedding

White or yellow *antirrhinum*; white candytuft (improved white spiral), white *gypsophyla*; white single hollyhock; white or yellow lupin; white *Pimpinella monoica* or lady's lace; white *Salvia globosa*; yellow sunflower; white *verbena*.

Climbers

White *Beaumontia grandiflora* (January to March); the white variety of *Concea tomentosa* (January and February); white *Porana paniculata* or bridal creeper, slightly fragrant (November and December only).

Shrubs

Yellow *Cassia alata* and *C. didymobotrya*; white *Clerodendron nutans*; white *Dombeya alba magnifica*; white *Hibiscus mutabilis*; white *Montanoa bipinnatifida*, with sprays of daisy-like flowers.

Scented plants for the background

Mathiola bicornis or night-scented stock; the semi-scandent shrub *Jasminum pubescens*.

Chapter ii

THE FORMAL GARDEN AND GARDEN ORNAMENTS

'The secret of all garden ornaments is this—they ought to look, somehow, as though they had grown there.'

Beverley Nichols: *Down the Garden Path*

The general design—GARDEN ORNAMENTS—Paved paths—Home-made paving and brick paths—Steps—Bird baths—Sundials—Bird tables—Seats—Paved pools—Ornamental vases and tubs—Low walls—Terraces—Pergolas—Arches—Summer houses

THE big lawn with its background of vivid shrubs and trees is essentially tropical and exotic throughout the long hot months, so that it is a change in the cold weather to turn to the ordered atmosphere of a small formal flower garden. Such a garden is a link between the house and the wilder parts of the compound; it is neat when the world outside the gates is untidy, and the very sight of a sundial surrounded by paving and annual flowers is mentally refreshing in contrast. By 'formal' one does not mean 'hard', for there are some gardens that are unsympathetic in their precise formality. A formal garden should always combine spontaneity with design.

Formal treatment is best for the very small compound where there is no room for a wide lawn or spreading trees. And if one expects to be in the same bungalow for several years, the expenditure on permanent garden ornaments is more than recovered in the pleasure to be got out of planning the garden.

[25]

THE GARDEN IN THE PLAINS

The general design

The formal garden should contain one special feature which gives meaning to the whole design. This might be a seat, a paved pool, a sundial or a bird bath ; or there could be two features, such as a sundial, second in importance to a seat. If the site is long and narrow the main feature is best at the far end as a climax to the general arrangement. A central position for the special feature gives an effect of extreme formality, but this is usually advisable on a circular plot of land, unless the feature happens to be a seat. Simple designs are the most effective in the long run, besides being cheap and easy to carry out.

A small sunk garden is attractive, especially if there is an ornamental stone or brick wall against the low bank, but such a low-lying area must be carefully drained.

Paved paths are decorative, but they should have a purpose and bear directly upon a paved pool, sundial or other special feature.

There must be unity of effect throughout a small formal garden. In large plots, brick and stone look most attractive in contrast, but restraint is needed when dealing with two different materials in a confined space. New bricks shouldering concrete are apt to remind one of the suburban villa in the making, and these materials need careful handling if they are to be used together. Brick alone is always charming and mellows surprisingly quickly.

The right place for roses would seem to be the formal garden, but although it is possible to get very fine blooms, rose bushes as such are not showy, and some beds of annual flowers will be needed in addition to give a gay effect.

A tall clipped hedge round a plot provides a background for the flowers and gives an element of secrecy

THE FORMAL GARDEN AND GARDEN ORNAMENTS

and surprise to the garden. It should only be planted, however, if there is space enough for the flower beds to be well away from its shade and root competition. The ordinary red-flowered hibiscus makes an excellent hedge for the purpose, as it is dark, clips well and grows thick rapidly.

The type of approach will depend upon the shape and situation of the garden. A low stone wall, say 2 to 2½ feet high, is often attractive across the near end of the garden so that you look over it at the flower beds beyond ; and if the site is slightly higher or lower than the rest of the compound, shallow semi-circular stone or brick steps look very attractive. An alternative to the wall is a low railing about 2 feet high, with the yellow *Allamanda schottii* trained to ramble along it and over an arch at the entrance in the centre. A pergola is always a possibility, either with single posts and a looping chain between them across the near end of the garden, or with double posts as a walk through which you approach it.

GARDEN ORNAMENTS

Paved paths

Paved paths are particularly effective in a formal garden. The material they are to be made of will depend upon what is available locally. In rocky places pieces of blasted stone with a flat surface uppermost will make adequate if somewhat lumpy paving ; but very often we have to rely upon concrete or brick.

Concrete is quite effective if carefully used, and sheets of it can be cut or moulded into sections representing flat, irregularly shaped paving stones. If the paving is to be dressed with small plants, chinks

THE GARDEN IN THE PLAINS

are left in the concrete in which to grow them. This type of paving may look somewhat hard and artificial, but such a path can be quite pleasing if it is laid in an attractive setting.

By far the easiest path to make consists of a single line of large flagstones or rectangular blocks of concrete. This type is rather formal and does not allow for curves, but it is very pleasant to look at and is less pretentious than artificial crazy-paving. An attractive arrangement of concrete blocks is to have two running the same width and a third a few inches wider, repeating this combination along the whole length of the path.

Large, irregular stones or blocks of paving placed 'stepping-stone' fashion across turf are ornamental, but such a path needs a lot of attention when quick-growing grass springs up round each stone.

Instead of concrete blocks or stones, bricks will make an attractive path if carefully laid.

The width of paved paths will vary according to the design of the garden, the type of paving and the space available; 3 to 4 feet are good measurements as a rule.

If the path is a long one and leads to an ornamental feature at the far end of the garden, such as a seat, it is as well to break the straight line by letting the path widen into a square, oblong or circular sheet of paving halfway down its length. A sundial, bird bath or small paved pool looks well, as a secondary feature, in the centre of this wider piece of paving. Or a narrow flower bed can be cut round it, planted with phlox or verbena which falls on to the stones. Should the plot be very narrow, it is effective to let a straight path widen out across the far end of the site to form a broad stage for the special feature.

THE FORMAL GARDEN AND GARDEN ORNAMENTS

A winding path between long flower borders fits well into some garden designs. This is best crazy-paved, as it is difficult to manage the curves with rectangular blocks of concrete or bricks.

A little moss on a path tones down artificiality, but in the rains all paved paths are apt to become green and slippery and will need frequent attention in the way of scraping and weeding.

Small plants on paths

Stones heat up strongly in the fierce Indian sun and cool rapidly on a cold night; consequently it is not easy to dress a path with small plants. Few temperate 'path' flowers are successful on the plains, but there are substitutes which can be grown in the cooler months in places where day and night temperatures do not contrast too strongly.

The moss verbena (*Verbena erinoides*) is a perennial which is tough enough to be walked on occasionally without injury, while *Sedum sarmentosum*, a stone-crop with yellow flowers, grows well in some places. Portulaca sometimes succeeds in a crevice filled with rich soil, but it will not stand being walked upon. The dwarf annual *Browalia elata* looks pretty against stone provided the plants are pinched back to induce spread, and the compact petunias or white alyssum are also attractive. All these plants need fairly big chinks left in the paving if they are to grow satisfactorily. Planting on paved paths should be done sparingly, and with irregular spacing to be effective.

Home-made paving and brick paths

If it is not possible to procure ready-moulded paving and an expert to lay it, the following methods of making it are fairly easy to carry out at home. Before starting work collect a few bricks or planks of wood and spread them out flat, close together, to

THE GARDEN IN THE PLAINS

make a temporary platform on which to mix the cement concrete.

A crazy-paved path laid direct on the earth

Many people lay paved paths direct on to the earth. This is all right provided the concrete is strongly made, the ground naturally firm, the site for the path well drained, and the rainfall light. It is not advisable, however, on soft soils or in districts with a moderate to heavy rainfall. In such places a firm foundation is very necessary, otherwise the paving will tilt or sink.

Excavate the site of the path to a depth of fully $2\frac{1}{2}$ inches, sprinkle a little sand lightly over the bottom, and ram the earth down very hard and quite level at the $2\frac{1}{2}$ -inch mark. Then have made some long, thin wooden reapers or battens to place along the ground at the edge of the path so that the paving will be straight at the sides. A sheet of concrete $2\frac{1}{2}$ inches deep and level with the ground is then laid over the excavated area to form the paving. The most natural looking crazy paving is made by marking the concrete into 'stones' with the end of a builder's trowel, and cutting it through before it has set hard. The cracks between the stones so formed should be 2 inches wide, and can be filled with soil eventually.

Some people prefer using moulds for the stones, the procedure being as follows. Prepare a number of wooden reapers $2\frac{1}{2}$ inches deep and 2 inches wide, cut in different lengths varying from 5 to 15 or 18 inches. Arrange these on their narrow sides on the floor of the excavation meeting each other in different combinations, to act as moulds for the crazy stones. Try to avoid too sharp angles, and make the stones a reasonable size, for if they are too small the paving gives a restless effect. Leave chinks to be filled with earth later if any plants are to be grown on the path.

THE FORMAL GARDEN AND GARDEN ORNAMENTS

It is as well to make enough reapers to lay not less than 6 feet of the path at a time.

Fill the moulds with concrete and finish with a thin layer of cement mortar. A slightly rough surface makes the paving look more natural. When the cement concrete sets the reapers can be removed and the cracks they have left be filled with earth, or with cement mortar tinted rather darker, or lighter, than the actual paving to emphasize the shapes of the stones. This cement filling saves weeding between the stones, but the general effect is artificial and hard.

A paved path with a broken brick foundation

In districts with a heavy rainfall it is advisable to have a firm brick core to the path. This is done as follows.

Excavate the site of the path to a depth of 3 inches. Ram the bottom of the excavation until it is firm, and then spread over it a $1\frac{1}{2}$ -inch layer of broken brick rubble mixed with dry earth. Roll this core until the surface is quite level and firm at the $1\frac{1}{2}$ -inch mark. The paving is laid on top of the rubble core, but in this case it need be $1\frac{1}{2}$ inches deep only.

If you want to grow plants on a path with a brick core, spaces in which to grow them must be left both in the concrete paving and through the layer of broken brick beneath. These holes are best arranged for before the brick core is spread over the site of the path, the method being as follows.

Wooden blocks or thick pegs, with pointed ends, of a size comparable with the size of the chinks for the plants, are driven into the ground at the bottom of the excavation at those points where the pockets of soil are to be. The pegs should be long enough for their tops to be 3 or 4 inches above ordinary ground level, so that they can be pulled out later.

THE GARDEN IN THE PLAINS

The brick core is then spread over the ground and round the pegs. While the paving is being laid on top shake the pegs slightly from time to time, so that they can be removed easily when the concrete has hardened. Fill the holes they have left with soil.

A path of rectangular concrete slabs

A concrete flagstone path can be made in the same way as the crazy-paved paths described above, with or without a broken brick core. The reapers for the moulds should be cut into lengths corresponding with the size of the flagstones. As an alternative the slabs can be moulded separately and laid on the path. Given exact dimensions and the number required, a good mason will make them.

The size of the flagstones will depend on the design and width of the path. As a suggestion, let every third slab be 22 inches long and 36 inches wide, and the two intervening slabs 22 inches long and 30 inches wide only. There are other combinations, of course, such as moulding smaller slabs herring-bone fashion, or in the 'basket' design (described in the section on 'Brick paths').

Concrete for general use

1 part cement	} mortar
2 parts sand	
water	

4 parts aggregate, graded $\frac{1}{4}$ to $\frac{3}{4}$ inch in size for fine work such as paving slabs, steps or ornaments, $\frac{3}{4}$ to 2 inches for walling or paved pools, and heavy ballast the size of a small orange for foundations.

Ballast or aggregate, as it is called, usually consists of shingle, crushed stone or broken brick. The aggregate for the concrete bowl of a paved pool should be of impermeable stone, not of a porous material like brick.

The aggregate should be wetted thoroughly, and the mortar mixed and added dry. Turn over the ingredients until the larger stones have been distributed evenly through-

THE FORMAL GARDEN AND GARDEN ORNAMENTS

out the mass. Then add water gradually until the mixture is wet but not sloppy. Spread the concrete where it is to lie and ram down firmly until it is level.

Concrete should be mixed a little at a time and used at once, as it begins to set about an hour after adding the water.

In place of stone or brick aggregate and mortar, a mixture of cinders and cement is sometimes used for paved paths, in the proportion of 4 parts cinders to 1 part cement, blended with water.

The surface of concrete work for ornamental purposes should be finished with a layer of cement and sand mortar, 1 part cement to 3 parts sand blended with water, and applied $\frac{1}{8}$ to $\frac{1}{5}$ of an inch thick.

Artificial colouring for cement work

Cement work in the garden may be coloured artificially. Many soft stone tints are procurable in the form of coloured powders to be mixed with the cement mortar. These are usually proprietary mixtures, but spent carbide is a simple compound that makes cement a good stone colour if added liberally to the mortar.

Brick paths

It is not always necessary to lay a hard core to a brick path, but the ground should be excavated deep enough to hold the bricks on a firm, level floor. In districts with a fairly heavy rainfall and soft soil, it is better to lay a hard core of broken brick to the path, or a bed of sand 2 inches deep. This will act as a firm foundation and drainage bed combined, similar to that described for paved paths.

Try to procure bricks of the size $9 \times 4\frac{1}{2} \times 3$ inches, if possible. Bricks can be laid in various designs. (1) Lay two bricks across the path one above the other, and next to them two along the path side by side, repeating this combination alternately every row to achieve a chequered or 'basket' effect. (2) Lay the bricks in lines across the path with the joins

THE GARDEN IN THE PLAINS

staggered in each row, and place a line of bricks along the path on each side as an edging. (3) Bricks laid herring bone fashion look well, but this pattern is more difficult to carry out and the edges are saw-like and have to be squared off. Paths of this type usually have a line of straight bricks on each side as edging.

Bricks should be laid so that their surfaces are level with the ground. The cracks between them are best filled with soil pushed in tightly, so that an individual brick can be reset if it sinks at all.

Steps

A compound laid on different levels is an ideal setting for a flight of ornamental steps, although such a garden is rarely seen on the plains. Even if the land has only a gentle slope, however, it is often possible to do a little levelling down and so provide an excuse for a few shallow steps.

Steps should fit naturally into the design of the garden. They are sometimes used to break the continuity of a long paved path, or they can be placed to bear directly on some feature, such as down to a formal sunk garden or up to a terrace. Materials can be of stone, concrete or brick. Straight-edged steps are the easiest to make, but semi-circular or three-fronted styles are more attractive in many cases. All steps should be built on a firm foundation.

Risers and treads

In making a step we have to consider the 'riser' or vertical face, and the 'tread' or horizontal face, and there must be a reasonable balance between these two parts. Generally speaking a low riser should go with a wide tread, the steps being shallow and easy, while a tall riser necessitates a narrower tread, making

THE FORMAL GARDEN AND GARDEN ORNAMENTS

a steep staircase. There are no hard and fast rules governing the measurements for risers and treads, although the slope of the bank to be climbed influences the steepness of a flight of steps. The following figures give an idea of the balance to be aimed at between a riser and the tread.

RISERS

5" high
5½" "
6" "
6½" "

TREADS

15" wide
14" "
13" "
12" "

A tread should not be narrower than 10 inches, else it is most uncomfortable to step on.

Nosing and overhang

With some steps the upper edges protrude or overhang, this being known as 'nosing'. With brick or stone steps overhang is not usually necessary for the sake of appearance, because the texture and colour of the materials themselves give interest. With concrete steps, however, a slight overhang throws a shadow which breaks the monotony of the rather dull surface.

Bird baths

A bird bath of the pedestal type is suitable for the formal garden. Materials can be of rough cut stone, cement concrete with a smooth finish or roughened like stone, or bricks used in a simple block-like design. It is possible to mix tile-red colouring with the cement mortar which gives it a terra-cotta shade.

The average height of a pedestal bird bath is 2 feet 6 inches, or 2 feet 9 inches, from ground level. The basin should not be deeper than 1¼ inches so that

THE GARDEN IN THE PLAINS

small birds can bathe. A concrete pedestal should be reinforced with a wire core.

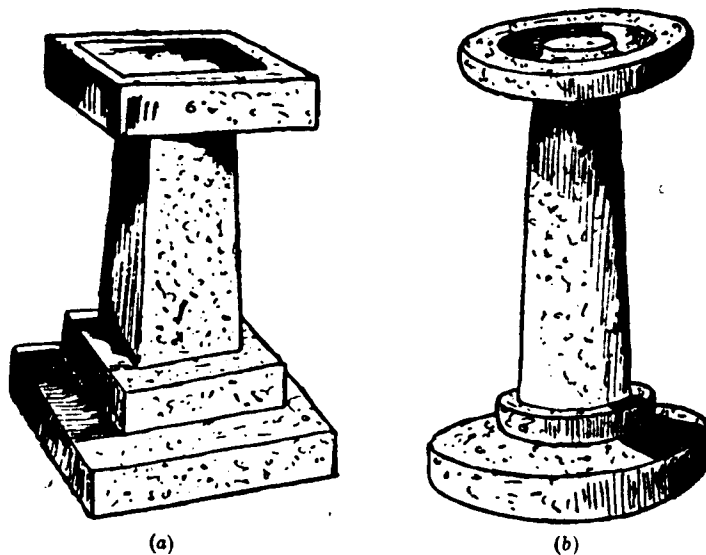


FIG. 1. BIRD BATHS

(a) Stone or concrete pedestal
Height, 33". Large base, 20" x 20"
Small base, 12½" x 12½"
Pedestal, 8" x 8" at the bottom

(b) Concrete pedestal
Approximately 33" high
Large base, 20" diameter,
top 16"

Sundials

The pedestal of a sundial can resemble that of a bird bath as regards height and form, but instead of the basin at the top there will be the dial and gnomon. All that has been said about materials in the section on bird baths will apply equally to the pedestal of a sundial.

The common sundial consists of a gnomon set on a specially prepared dial. The gnomon is a triangular piece of sheet metal cut with great accuracy so that the sloping side makes an angle with the base equal to the latitude of the place where the sundial

THE FORMAL GARDEN AND GARDEN ORNAMENTS
is to be used. Thus in North India the angle of the gnomon will be about 30 degrees, whilst in the South it will be 10 degrees.

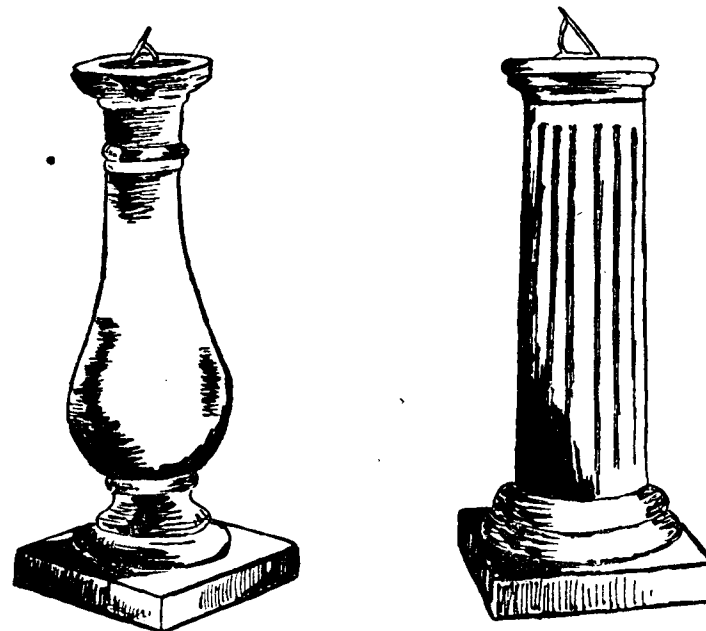


FIG. 2. SUNDIALS

Approximately 30" high

The broad part of the gnomon points true north, not necessarily magnetic north as shown by the compass. The moving shadow cast by the gnomon as the sun crosses the sky shows the time on the dial.

The making and placing of the gnomon, the dial arrangement and the fixing of the pillar support are all tasks requiring accuracy beyond the capacity of the average gardener, and the help of the friendly Survey Department will no doubt be needed unless the sundial is purely for ornament.

THE GARDEN IN THE PLAINS

Bird tables

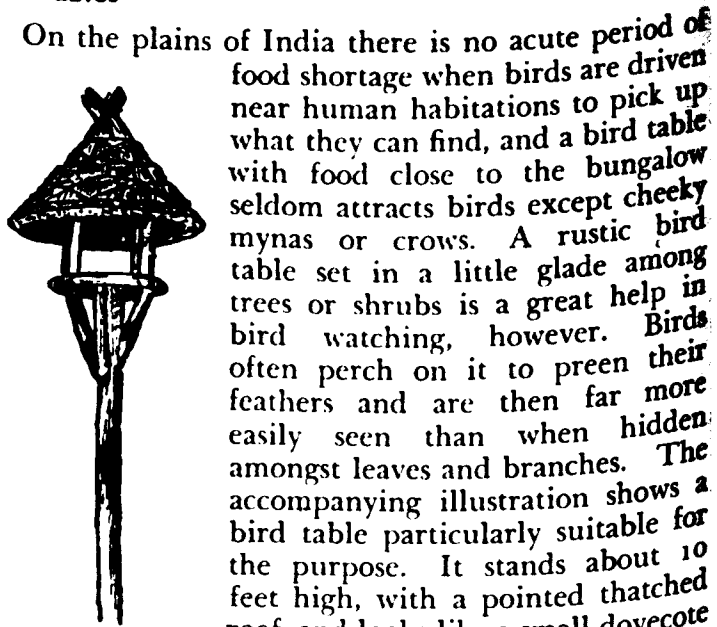


FIG. 3. A RUSTIC
BIRD TABLE

Table 10' above ground
level

On the plains of India there is no acute period of food shortage when birds are driven near human habitations to pick up what they can find, and a bird table with food close to the bungalow seldom attracts birds except cheeky mynas or crows. A rustic bird table set in a little glade among trees or shrubs is a great help in bird watching, however. Birds often perch on it to preen their feathers and are then far more easily seen than when hidden amongst leaves and branches. The accompanying illustration shows a bird table particularly suitable for the purpose. It stands about 10 feet high, with a pointed thatched roof, and looks like a small dovecote among the trees. The rustic materials of wood and thatch fit in well with garden surroundings, but seasoned hardwood should be chosen for the post and table. The underground parts must be tarred, and the smooth exposed surface rubbed with a wood preservative.

Seats

A seat as a special feature makes a fitting climax to a garden design. Even though there is another feature such as a sundial or bird bath, the eye is led inevitably towards a seat if it is suitably placed.

In India wooden seats are often not practicable. If there is a paved path the seat can match it in

THE FORMAL GARDEN AND GARDEN ORNAMENTS

material, and can be of stone, concrete or brick. A stone or brick seat should not be cumbersome or heavy, but it looks more important if it is architectural in character, with a dark background such as a tall clipped hedge. An attractive setting is given to the seat if it is recessed into a hedge, a straight seat in a square-ended recess, or a curved seat into a round recess. Further importance is added if a dark green tub is placed at each end of the seat to hold scarlet or orange bougainvilleas trained and clipped as standards.

The seat should be low enough to sit upon comfortably, say 18 inches or at the most 20 inches high. If the seat is entirely solid, there should be a slight overhang of the top so that heels can be put back with ease. A good top width is 20 inches, and 60 inches is the length for a straight seat.

Paving in front of a seat prevents wear and tear on grass, and is dry for the feet. The situation should be shady and the outlook attractive if the seat is meant for use as well as for ornament.

Paved pools

A paved pool may not be quite so beautiful, perhaps, as a natural pond, but it makes a very pleasing nucleus for the formal garden. It should be simple in outline, and any severity can be softened by skilful planting round the rim. (See the section on 'The paved pool' in the chapter 'Water Gardens and Marshy Ground'.)

Ornamental vases and tubs

Ornamental vases are very suitable for guarding the descent to a 'tank' treated formally, for a position in the formal garden, for placing at intervals along

THE GARDEN IN THE PLAINS

the edge of a terrace, or on a low wall. The illustration shows a large vase approximately 2 feet 3 inches high. Vases on pedestals are popular, but the proportions of the vase to the pedestal must be carefully thought out. A low brick pillar with a cavity at the top to hold earth makes a good substitute for a moulded vase.



FIG. 4. A MOULDED VASE

Tubs containing small flowering shrubs are decorative in the formal garden. They are best made of teak or some strong wood, strengthened with hoops of iron, and treated with waterproof varnish or painted green. In shape they can be round or square, with diameter or side measurements from 16 to 20 inches.

Low walls

Walls low enough to see over are useful for defining the limits of a formal garden.

A double-faced wall of loose stones

A pretty double wall is made with loose stones built up on either side of a core of earth, forming a flower bed in the centre along the top. Flowers look pretty in such a rocky setting, and small plants can often be persuaded to grow in chinks between the stones. Disadvantages of this type of wall are that it sometimes harbours snakes in the crevices, and the bed along the top is likely to stand empty all the hot months, for the stones warm up in the sun and radiate heat which scorches the plants. When full of flowers in the cool weather such a wall can be most attractive, however, and looks its best quite low, say from 18 inches to 2 feet high, or at the most 2½ feet.

The sides of a double-faced wall of loose stones

[40]

THE FORMAL GARDEN AND GARDEN ORNAMENTS

should never be quite straight, but must incline inwards, each face receding about 2 inches to every foot of height. The first step in building a wall is

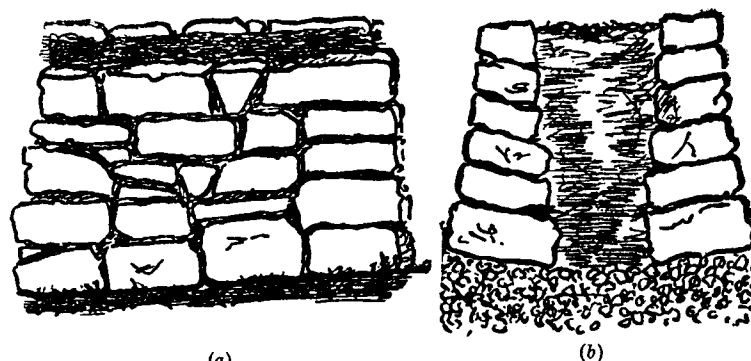


FIG. 5. DOUBLE WALL OF LOOSE STONES

(a) Front view

(b) Sectional view showing the earth core and rubble foundation

to dig a trench about 6 inches deep, and ram the bottom hard and firm. The excavation can be filled with brick rubble and the wall built on top. The gradual sloping inwards of the wall must begin at ground level. Build the two walls simultaneously with the earth core right up from ground level, packing soil between the layers of stone. The stones of each course must bridge the joins of those beneath, and they should be tilted slightly backwards into the earth core. Choose big stones if possible, and a large bondstone passing through the wall from side to side at occasional intervals adds strength.

A wall to be 2 feet high above the ground can be about 2 feet wide at the top, which means that the width at ground level (and at the bottom of the trench) should be 32 inches. Pack the earth core firmly, and see that there is a strip of soil 9 inches wide, at the

[41]

THE GARDEN IN THE PLAINS

very least, between the inner edges of the ~~stone~~ along the top of the wall.

A solid wall

A solid wall with a flat table-top projecting a few inches from the straight sides is sometimes preferred to a double-faced wall. It is not quite so decorative as the wall holding flowers, but there is no ugly period when the earth along the top is bare, and it has no crevices to harbour small snakes. Either stone, concrete blocks or brick may be used. Concrete or brick vases filled with annual flowers or ornamental shrubs can be placed at intervals along the top, the unadorned wall strikes you as looking too severe.

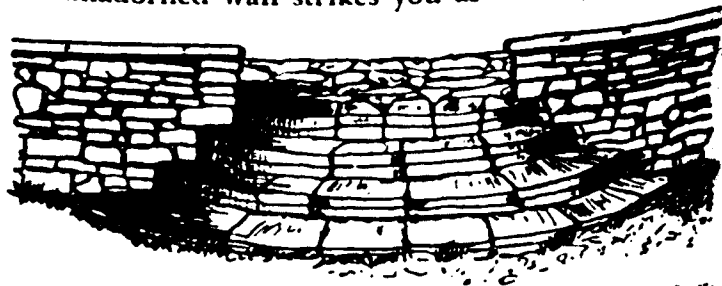


FIG. 6. A LOW SOLID WALL WITH PROJECTING TABLE-TOP, AND SEMI-CIRCULAR STEPS DESCENDING TO A SUNK GARDEN

If the height of the wall is 2 feet, the width can be about 18 inches, and the projecting table-top 21 inches wide.

There should be a firm foundation to the wall, consisting of a trench 6 inches deep filled to the ground level with brick rubble or stone ballast mixed with earth and rammed down hard, along which the wall is built.

Terraces

A terrace is a raised level space or platform supported by a retaining wall. Terraces are only practicable

THE FORMAL GARDEN AND GARDEN ORNAMENTS

on sloping ground. In hilly districts, where the slope is steep, a garden may consist of a series of terraces down a hill; but in the plains sloping ground is rare, and then seldom allows for more than one shallow terrace.

A terrace in front of a house should be of a reasonable width, or it will give a restricted, hunched-up effect. The slope of the land and the width of the terrace govern the height of the drop-down.

A balustrade is a wall above terrace level and adds importance to a high terrace if it is built about 3 feet high along the top of the retaining wall. A shallow terrace needs a simple stone coping as a finish and to serve as a protection to the retaining wall. Wide stone vases or tubs filled with flowers or trailing shrubs are striking if placed at intervals along a low wall. A small terrace looks well when paved with blocks of stone or concrete. Turf is better for a wide terrace, but a paved path can be laid across it to steps descending to the lower ground. A terrace provides an excuse for ornamental steps which should match the materials used for the wall.

Retaining walls

Before levelling the terrace, build the retaining wall to the desired height and width in stone, concrete or brick. Excavate the site 18 inches deep or until firm earth is reached, and fill the excavation to ground level with rubble packed tightly. This foundation should be 12 inches wider than the base of the wall to be built on top. The thickness of the wall depends upon its height and the amount of earth to be retained. A wall 6 feet high can be about 18 inches wide at the top. Additional strength is given if a high wall slopes backwards on its outer face, receding $1\frac{1}{2}$ inches to every foot of height, forming a buttress against the bank. Therefore, a wall 6 feet high and $1\frac{1}{2}$ feet wide at the top, could be $2\frac{1}{4}$ feet wide at the base, with a founda-

THE GARDEN IN THE PLAINS

tion $3\frac{1}{4}$ feet in width. Miniature walls usually have straight sides. If the rainfall is heavy, place a few short pipes through the lower courses at intervals along the wall, to drain away any seepage water that accumulates behind it.

A 'dry' wall of big stones without mortar is sometimes built against a bank, and looks attractive if small plants fill the chinks between the stones. The stones should bridge the gaps between those of the course below. Each course should be slightly stepped so that the wall slopes backwards 2 inches for every foot of height, with the stones tilted into the bank. In addition, a high wall or revetment can be stepped or offset 6 inches at every 3 feet of height.

Levelling the terrace

When cutting into the bank to make the terrace, the tendency is to leave the sub-soil bare at the back and to bring all the good top-soil to the front against the retaining wall. Avoid this by keeping the top-soil separate and filling in with sub-soil first, packing it firmly behind the wall. Spread the fertile top-soil evenly over the terrace.

Pergolas

Pergolas make attractive stands for climbing roses or bright climbers. Thick wooden posts can be used if the wood is well seasoned and hard, the underground portions tarred, and the exposed parts rubbed with a preservative. A more durable pergola will have stone, or concrete slabs imitating stone, or brick pillars.

Pergolas can be double or single. A double pergola has two lines of pillars connected at the top both along and across with light bars of wood treated with some preservative, forming a walk underneath. It makes a well defined approach to a flower garden or

THE FORMAL GARDEN AND GARDEN ORNAMENTS

to the big lawn, and should always span a path. A single pergola has one line of pillars, each joined to the one next to it by a bar of wood, or by a chain or treble-woven rope looping from pillar to pillar. This type can be used to outline a side of the lawn, or else placed to form a colourful background.

A pergola brings height to break the flat planes of a level compound, and it can be specially useful in giving a new garden a mature look before any trees have grown enough to make themselves felt.

Height and spacing of pillars

A good height for the average single pergola is 7 feet 6 inches from ground level to the top of the pillar. A substantial double pergola to be walked under ought to be a little higher, say 8 feet to the top of the pillar, and with the two sets of wooden bars (both along and across the pergola), just under 9 feet altogether. In order to keep the proportions pleasing to the eye, a pergola with slender pillars should be a few inches lower than one with thick pillars.

The distance between the pillars is usually from 8 to 10 feet; and 6 to 9 feet across a double pergola.

Thickness of pillars

The thickness of brick or stone pillars may vary from 13 or 14 inches to 17 or 18 inches square. A fairly slender pillar is suitable when light and frothy flowering climbers or roses are to ramble along a looping chain; but a more substantial type is needed when heavy or rampant climbers are to be supported on wooden bars.

If bricks are used, size $9 \times 4\frac{1}{2} \times 3$ inches, it is as well to keep to $13\frac{1}{2}$ inches, with one and a half bricks to a side, or to 18 inches with two bricks to a side. Of the two sizes, $13\frac{1}{2}$ inches is usually better for a small garden, while the 18-inch type is suitable if the pergola is to hold a heavy creeper in the spacious setting of a

THE GARDEN IN THE PLAINS

big lawn. The mortar between the bricks will add slightly to the dimensions given. A few nails or screws inserted between the bricks at intervals up the pillar are a help when tying a climber to the support. In windy districts an iron core to the pillar may be necessary to give strength, the iron rod continuing for several feet below ground.

Wooden bars for pergolas

The wooden bars or battens along the top of a pergola must be of strong, seasoned wood treated

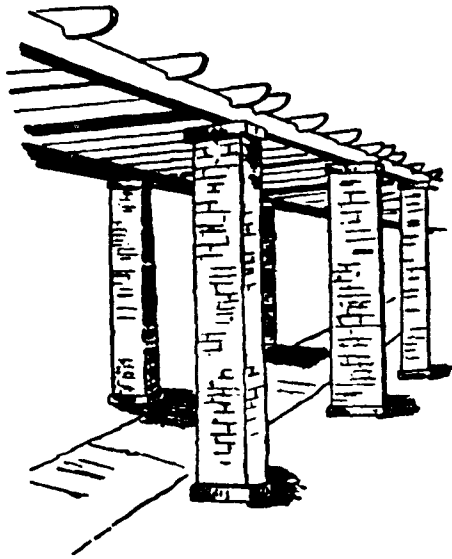


FIG. 7. A BRICK DOUBLE PERGOLA WITH TWO SETS OF WOODEN BARS

with a preservative. The wood is usually cut either 6 or 4 inches by 3 inches thick. As a rule the bars that connect the pillars along a pergola are rested on their narrow side, and those that cross a double pergola, on the wider face.

With a double pergola the simplest arrangement is to fix the bars along the two lines of pillars first,

THE FORMAL GARDEN AND GARDEN ORNAMENTS
settled on top by being pressed on to a shallow bed of cement mortar. The battens which are to cross the pergola are placed on top of those which go lengthwise, and should be notched to a depth of $1\frac{1}{2}$ inches where they are to grip the bars beneath. Intermediate transverse bars are needed in addition to those that cross the pergola between the pillars, so as to give

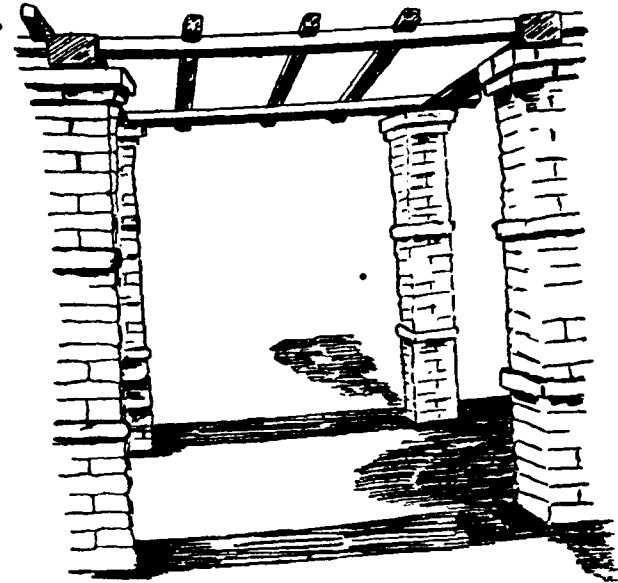


FIG. 8. A STONE OR CONCRETE DOUBLE PERGOLA WITH THREE SETS OF WOODEN BARS

plenty of support to the climbers. The ends of the cross bars project slightly and look nice cut at a slope or rounded up to a point (see Fig. 7).

Foundations for pillars and posts

Stone or brick pillars need firm foundations, especially if they are to support heavy climbers. Where each pillar is to be, a hole should be cut in the ground, 18 inches deep, or more if firm earth is

THE GARDEN IN THE PLAINS

not reached at this depth, and about 24 inches square. This hole can be filled up to ground level with rubble mixed with some soil as a dry mortar, or 1 part lime to 2 parts sand can be used as a wet mortar with heavy aggregate, and the pillar built on top. If the pillar is built on a lawn, the top 4 or 5 inches of rubble can be removed round its foot, and the space filled with soil so that grass can be grown right up to the pillar.

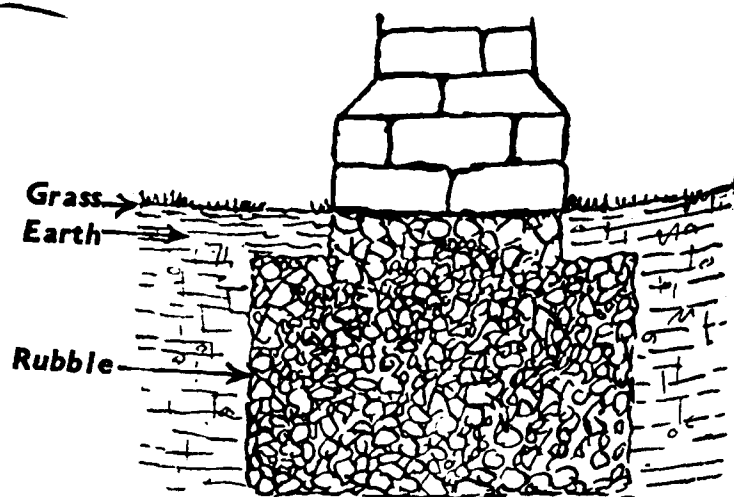


FIG. 9. PILLAR FOUNDATION
A brick pillar on a rubble foundation,
with earth and grass against the foot

Wooden posts should have a hole cut where each is to be, 21 inches deep and about 15 inches square. A foundation platform of either concrete or brick rubble, 3 inches deep, is then laid at the bottom of the excavation, on the top of which the post rests. There will be 18 inches of the post's length below ground level. Above the foundation a 12-inch layer of brick rubble packed with earth should be rammed

[48]

THE FORMAL GARDEN AND GARDEN ORNAMENTS

tightly round the post. The remaining 6 inches of the excavation can be filled with soil so that grass can grow up to the post. If the post rots it can be renewed easily as it is a simple matter to loosen the rubble packing round it.

Arches

An arch marooned on the lawn with no path underneath it or reason for being there looks pointless. It should either span a path, or act as a gateway in a hedge through which to approach another section of the garden.

Wooden rustic arches look more attractive than any other, but they are not advisable in a land where dead wood rots quickly or is eaten by white ants; metal arches are far more durable. A curved arch is made by two strips of light iron bent to form double curved posts, placed 40 or 50 inches apart, the space between them being filled with an open-mesh wire netting. A square topped arch has two bars of light iron lashed to two pairs of iron posts, the space between them being filled with wire netting. Angle iron or old pipes make good frames for arches of this type.

The span of an arch will depend upon the width of the path beneath. The height from ground level should be from $7\frac{1}{2}$ to 8 feet at the centre so that it can easily be walked under. The posts must be bedded in the ground for 18 inches, making a total minimum length of 9 feet for a straight post. Brick rubble packing, both round and beneath the underground portions of the posts, helps to keep them in place. All metal arches look best if painted green.

Summer houses

A rustic summer house will look very pleasant if it is recessed among trees or shrubs; but it may also

[49]

THE GARDEN IN THE PLAINS

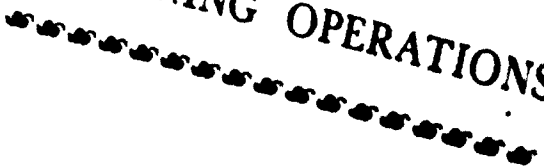
appear ridiculously like a small bandstand if left solitary on a lawn. A high-pitched roof is attractive if carried out in thatch, but a lower pitch is better for tiles. A style easily built with a little outside help is as follows.

A low circular or hexagonal brick plinth is built to form the floor, with one or two shallow steps where the entrance is to be. Four, five or six stout posts of some lasting wood treated with a preservative are placed round the sides of the plinth at equal intervals, one space forming the entrance. The plinth is then covered with a circular or hexagonal pointed thatched roof of steep pitch, with projecting eaves. Instead of walls, a railing 2 or 3 feet high is carried round the house between the posts from each side of the entrance, and light flowering creepers trained to twine along it. Clumps of tall lilies on either side of the steps look pretty.

There are more elaborate styles that can be built fairly easily, but the help of a good builder will be needed for a tiled roof or much concrete work.

PART TWO

GARDENING OPERATIONS



THE GARDEN IN THE PLAINS

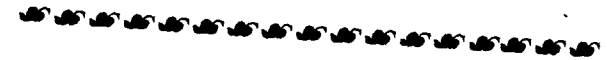
appear ridiculously like a small bandstand if left solitary on a lawn. A high-pitched roof is attractive if carried out in thatch, but a lower pitch is better for tiles. A style easily built with a little outside help is as follows.

A low circular or hexagonal brick plinth is built to form the floor, with one or two shallow steps where the entrance is to be. Four, five or six stout posts of some lasting wood treated with a preservative are placed round the sides of the plinth at equal intervals, one space forming the entrance. The plinth is then covered with a circular or hexagonal pointed thatched roof of steep pitch, with projecting eaves. Instead of walls, a railing 2 or 3 feet high is carried round the house between the posts from each side of the entrance, and light flowering creepers trained to twine along it. Clumps of tall lilies on either side of the steps look pretty.

There are more elaborate styles that can be built fairly easily, but the help of a good builder will be needed for a tiled roof or much concrete work.

PART TWO

GARDENING OPERATIONS



Chapter iii

SOIL AND MANURING

‘And as to you Corpse, I think you are good manure,
but that does not offend me. I smell the white roses
sweet-scented and growing.’ —Walt Whitman

SOIL MANAGEMENT—Drainage—Conserving moisture—The food
a plant needs—Soil deficiencies—BULK MANURES—Dung—
Storing cattle or stable manure—Liquid manure—Compost—
A gardener's compost pit—How much bulk manure to add—
Green manure for the vegetable garden—ARTIFICIAL FERTILI-
ZERS—Lime—Hydroponics

AFTER climate and weather, the soil is perhaps the most important prime factor a gardener has to consider. Many failures or successes are due to certain soil conditions, unfavourable or otherwise, and for that reason some knowledge of the soil is both essential and interesting.

Manuring and cultivation are closely allied and, indeed, the word ‘manure’ is derived from ‘man-oeuvre’ which means to work by hand. In earlier times, to manure the land meant to carry out any process whereby the soil condition was improved, be it by tillage or the addition of lime or dung.

To garden successfully it is helpful to have some knowledge of manures and their functions, and it does not do to be like the perfect lady in the poem

‘... who was so pure
She couldn't say the word manure.’

THE GARDEN IN THE PLAINS

SOIL MANAGEMENT

In order that a plant shall thrive the soil must be kept friable, that is to say, open and easily crumbled, for only in this condition can the roots explore freely for food.

A soil is brought into good tilth by cultivation. Land which has just been cleared of jungle is in good condition because it has been kept open by the roots of trees and plants, and land which has been under cultivation for some time is the same. On the other hand, grazing land which has been stamped down by cattle, or old building sites, which often surround new bungalows in India, take some time to bring into good heart. Hard soils should be hoed into clods and allowed to dry out in the cold weather, for drought and the blazing sun in India do the same for the tilth of the soil as do the frosts in cold lands. When once the soil is in good condition, garden cultivation becomes a simple matter.

It must be remembered that most of the valuable plant foods in a newly turned soil are found in the top nine inches or so. Therefore very deep cultivation, which brings up the sub-soil and mixes it with the top, may defeat its own immediate end, and reduce for the time being the fertility of the plot. This actually happens when cultivated land is given an extra deep ploughing. In a garden, however, cattle or bulk manure is added in such large quantities to flower and vegetable beds that the top-soil can be deepened to 18 inches or so if manure is thoroughly mixed into the soil to that depth. Whether a plant is deep or shallow rooting, it thrives best in a deeply cultivated soil.

In some gardens the soil may be too heavy, in others too light. A heavy soil is made friable by correct cultivation when it is not too wet, and by the

SOIL AND MANURING

addition of bulk manures, e.g. cattle manure, stable manure, leaf mould or composts. In the tropics, organic matter is soon dissipated from the soil under cultivation and needs frequent renewal. The addition of quick lime,¹ at the rate of 3 ounces per square yard, may lighten stiff clays, but it is better to use bulk manures if possible, applied at the rate of 20 pounds per square yard every year, for flower and vegetable beds. There may be some temptation to add sand to a clay soil in order to lighten it. This is a fatal mistake and results in the formation of a hard macadam-like skin on the top of the soil.

In the plains one often has to cope with sandy or silty soils. These are a trial to the gardener because they often contain so little nourishment, whilst in addition a sandy soil suffers from drought. Bulk manures help to build up such soils, and they may be made stiffer, and less vulnerable to drought, by an application of crushed limestone at the rate of 6 ounces per square yard.

Drainage

Drainage is a problem which every gardener meets in India, and in this connexion it is necessary to remember that a plot of land can usually deal with the inch or two of rain which may fall upon it in a day, but it cannot cope with the extra water which may flow in from surrounding areas. Much drainage must therefore be of a protective nature.

Many gardens have low-lying areas which need protective draining. The drain should run along the top or round the slope of the land on the contour, and give into a drain which runs down the slope. In places where the monsoon comes as a deluge, these last drains are a sore trial, especially if they run down

¹ For the differences between quick lime, slaked lime and limestone, see the sub-section on 'Lime' in this chapter.

THE GARDEN IN THE PLAINS

a steep slope in which the water may cut a miniature ravine overnight. Drains should be 9 inches wide and 7 inches deep, and if possible steep drains should be lined with bricks or stonework, a luxury which is worth while if the rainfall is heavy. Grass covered seepage drains are described in the chapter 'Grass and Lawns', and are less conspicuous than the open type round a lawn.

Conserving moisture

In most parts of India we have to cope either with tropical downpours or with long periods of drought. During the latter, the watering-can is called into play, but even then some of the deeper rooting shrubs, which are little affected by surface watering, may suffer if the drought is prolonged.

Mulching

In order to conserve the moisture which is in the soil, the space round a plant should be kept free from weeds and the earth mulched in dry weather. A mulch is a covering on the soil which prevents loss of moisture from below. This may be a layer of fine leaves or vegetation, or it may consist of a layer of finely forked earth, 3 or 4 inches deep, which becomes powdery and stops undue loss of water through evaporation from the soil below. It often happens that in the middle of the dry weather a shower of half an inch or so arrives. This often does more harm than good to the shrubbery since the mulch is destroyed, and the solid cake of soil formed round the bush again allows sub-soil moisture to be lost freely. After such showers the soil must be mulched again.

The food a plant needs

When a plant is in foliage the leaf manufactures food drawn from the soil by way of the rootlets, and

SOIL AND MANURING

from the air through pores on the undersurface of the leaves. This food is used for further growth, or is stored in the stems and roots for future use. It is on such stores that the dormant perennial calls when the spring impulse sends out new shoots.

A plant needs fifteen or so elements from which to manufacture its food, and most of these are always present in the air or soil in sufficient quantities. There are a few, however, which are often short, and these are nitrogen, phosphates, potash and sometimes lime. Nitrogen is, of course, present in the air, but most plants are unable to tap this supply. A certain order of plants, the *Leguminosae*, among which are peas, beans and lupins, certainly do obtain nitrogen indirectly from the air, but as a rule plants depend solely on the nitrogen they find in the soil. Phosphates, potash and lime are available through the soil.

The elements which may be deficient can be added in the form of suitable manures. Nitrogen is found in the dung of cattle or horses, whilst potash and phosphates are also present in small quantities. A useful source of potash is ordinary household wood ashes; and bones contain phosphates, but they must be ground to a meal to be of practical use in a garden. Lime will usually have to be purchased, and it is best added in the form of powdered limestone, which costs about a rupee a maund (80 lb.). Nitrogen, potash and phosphates can be added as artificial fertilizers, and are described later.

Soil deficiencies

It is sometimes possible to tell by the look of a plant whether the soil is deficient in any essential. The table which follows gives some indication of the plant symptoms which accompany certain soil conditions.

THE GARDEN IN THE PLAINS

LEAVES

Poor growth, yellowish colour	=	Lack of nitrogen
Greyish colour	=	Lack of phosphates or potash
Tall, spindly plants	=	Not enough light, or the plants too closely packed
Premature defoliation ..	=	Lack of nitrogen, potash or phosphoric acid
Rich green leaves and thick stems	=	Plentiful supply of nitrogen
Blanched leaves	=	Excess of lime
Dark-coloured leaves which tend to crinkle	=	Acidity of soil; lime needed
Leaves of patchy appearance	=	Insufficient potash

FRUIT

Bright red (apples)	=	Lack of nitrogen, or effect of grass close round the tree
Blotchy (tomatoes)	=	Lack of potash
Blanched	=	Lack of nitrogen

SEEDS AND ROOTS

Slow in ripening	=	Excess of water or nitrogen, lack of phosphates
Failure to ripen	=	Lack of potash
Stunted roots	=	Acidity, lack of drainage, hard soil, lack of lime or phosphates
Good development of roots	=	Well-cultivated soil, sandy soil

BULK MANURES

Bulk manures are best for a garden, for they improve the tilth of the soil as well as provide food for the plant.

Dung

The commonest and most easily obtainable bulk manure in India is cattle or cow manure. This when fresh or 'wet' contains about four-fifths water,

SOIL AND MANURING

and $\frac{1}{4}$ to $\frac{1}{2}$ per cent nitrogen, together with some phosphates and potash. It owes much of its efficiency to its bulk. When cattle manure is stored it matures and becomes more valuable as a plant food, losing some of its water in the process. In this 'dry' state, when it is still about half water, it is in better condition for garden use than when wet.

Horse manure, when fresh, is drier than cow manure and, as a result, matures more quickly and produces more heat in doing so. It is usually a little richer than cow manure, but is apt to deteriorate more rapidly.

Stable manure is generally understood to consist of the dung and litter taken from under the horse. This is rich in potash by virtue of the urine with which the litter is saturated. Cattle may be bedded down with dry grass or dry cut jungle, and the mixture of dung and bedding, the latter being soaked with urine, makes a valuable manure. All stable manure should be allowed to mature under cover before being used.

Poultry dung is richer than cow dung, and is usually applied as a dilute liquid manure. It resembles guano (the excrement of sea birds) but is less rich.

Dried sludge

Dried sludge, prepared from sewage, is available in some cities. The food value of this fertilizer may vary widely, as widely as that of oilcakes. It should be considered as a concentrated manure, not as a bulk manure like cowdung or compost. If it is purchased, local advice should be obtained regarding the amount to use of the particular sample.

Storing cattle or stable manure

Fairly fresh cattle manure is used for kannas, but for most purposes it should be allowed to

THE GARDEN IN THE PLAINS

mature well before being added to flower or vegetable beds.

Manure stacked in a shed should be covered with a layer of earth because it deteriorates if left exposed to the air for long. A pit may also be used for storage, but again it is necessary to seal the exposed part of the manure with a layer of earth, 2 to 3 inches thick.

The manure can be considered ready for use on flower and vegetable beds when it can be rubbed through a coarse sieve with a half-inch mesh. It need not be so fine for shrubs or big perennial plants.

Liquid manure

Doses of liquid manure are given to some plants when they are about to flower, as a stimulant which is quickly assimilated.

Liquid manure, or slurry, may be made by charging a kerosene tin one-quarter full with fresh cow manure, and filling right up with water. Add two cigarette tins of soot if available. Keep for ten days, stirring the mixture daily. Use quarter of a kerosene tin of the manure water to one whole tin of clear water, and apply, forking the ground first.

Compost

Cattle manure can be both expensive and difficult to procure in some places, but an equally good substitute can be made at home by manufacturing compost, using the word to denote rotted vegetable matter. Cattle manure is actually vegetable matter broken down in the digestive tract of the cow, whereas in making compost a similar process is carried out in the compost pit.

Compost is an excellent bulk manure and contains the elements nitrogen, potash and phosphates, but the proportion of potash is greater than in cow manure.

Vegetable matter, as such, is not a plant food, and has to be broken down and changed to humus before it is acceptable to the plant. Nature herself does this slowly in the soil, but when we want to attain this end artificially and rapidly, it is necessary to add 'activators' or 'starters' to the vegetable matter.

The activators may be natural ones like dung, soiled bedding from the stable, together with wood ashes. Urine, either as urine earth or with soiled bedding, is an essential, for dung alone will not turn vegetable matter into compost. In making urine earth, a suitable method is to put a layer of soil about 9 inches deep on the floor of the cattle shed. This is beaten down hard, and gradually becomes soaked in urine. Small quantities of this earth can be taken up as needed, and replaced by fresh earth.

On the other hand, starters may be wholly artificial, such as calcium cyanamide and bone dust, or sulphate of ammonia and bone dust. These substances cost money, however, and if there are nearby cattle or horse stables, natural products are preferable.

As the vegetable matter breaks down, the compost heats up, and if the process is proceeding vigorously, a temperature, in the centre of the heap, of 130° F. to 150° F. may well be registered in about three weeks from the time of stacking the raw material and the activator. These composts, made strictly according to a programme, are ready for use in about 90 days. There are several recognized systems of making compost on a large scale, using natural or artificial activators.

A gardener's compost pit

In a garden it is often difficult to procure enough vegetable matter to fill a pit in a given time, and it is necessary to use the daily accumulation of

THE GARDEN IN THE PLAINS

household refuse as an ingredient for compost, in addition to leaves and cut grass obtained occasionally. As a result, the method of making compost in a garden is necessarily slower and more haphazard than that employed on estates or farms. Decomposition is not so rapid as in pits put down systematically, and temperatures are generally lower than those detailed in the foregoing section. The following method of making compost is admittedly a gardener's compromise, but it has been found to work well.

In every garden there is an accumulation of vegetable matter consisting of dead plants, leaves, cut grass, and so on. Any soft greenery will do for compost, but do not use woody stems and sticks or hard leathery leaves such as those of grevillea or gum trees. All this green stuff should be collected periodically and spread out in the sun to dry partially before being taken to the pit. When it is half sundried, vegetable matter packs lightly and allows air and water to enter the mass and carry on essential decomposition.

To make and fill the pit

Dig a pit 6 to 8 feet square and 2 feet deep. Throw in some of the collected green stuff in alternate layers with the daily accumulation of household refuse. Chickens' innards, chicken-house refuse, egg shells, vegetable peelings and tea leaves are all useful. When the contents of the pit have reached a height of about 5 inches, add a 1-inch layer of fouled stable bedding, or urine earth and dung. If such natural activators are not available, sprinkle half a pound of sulphate of ammonia and half a pound of bone meal over the pit.¹ Next, sprinkle a layer of wood ashes lightly and evenly over the pit. Fresh coal ash is not desirable, and if wood fuel is not used in the house collect

¹ Sulphate of ammonia and bone meal can be bought from manure merchants in any big centre and, indeed, many small towns nowadays.

SOIL AND MANURING

twigs and brushwood to burn for ash. Finally pour on 4 to 12 gallons of water (one to three full kerosene tins) according to the size of the pit and the dryness of the weather. Continue with green stuff and household refuse for another 5 inches, then add a layer of natural or chemical activators, a sprinkling of wood ashes, and 4 to 12 gallons of water, so making a sort of 'layer cake' until the pit is full. Air is essential for decomposition, so do not press down the compost.

The time a pit takes to fill depends upon the regularity with which the green stuff becomes available, but it usually takes at least several weeks. When the pit is filled to 2 feet above ground level, empty it, turn over the contents for aeration, and put them back into the pit again loosely. In about three months from the time the pit is re-filled the contents should have changed to resemble a dark rich humus and be ready for use. If decomposition seems slow, turn the compost over again for further aeration and add more water if it seems necessary. It is as well to use the compost when it is ready, but it can be stored by sealing with earth in the same way as cattle or stable manure.

For manuring flower or vegetable beds in August, start a pit in April. Weather conditions influence the rate of decomposition to a certain extent, and experience helps considerably in making good compost with regard to the time a pit takes to fill, the amount of water to add, and so on. The process may seem troublesome, but the results are definitely worth while.

Before using the compost, screen it through a coarse wire sieve to eliminate any undecomposed stalks. A series of two or three pits will ensure a steady supply of manure.

Compost made in the rains must not be in a pit

THE GARDEN IN THE PLAINS

that will be flooded, and if the rainfall is particularly heavy it is better stacked in a heap on the ground. A roof for the compost pit or heap should be erected consisting of sloping sheets of corrugated iron on four short wooden posts. A wire mesh covering that can be lifted helps to protect the raw compost from scrounging jackals or crows.

How much bulk manure to add

No very definite suggestion can be made regarding the quantity of bulk manure to add to flower and vegetable beds. The amount will depend upon the poorness of the soil, its lightness, and the climate. A poor light sand in a hot climate needs large quantities of bulk manure which are soon used up under cultivation, whilst a rich loam can be worked with less.

When a soil is in fairly good condition, 10 pounds of manure per square yard, amounting to about 20 tons per acre, may be added twice a year. The first dose should be given with the spring rains, and the second in August or September, making 20 pounds per square yard (40 tons per acre) in all. This amount can be increased for especially poor soils, but remember that too heavy manuring tends to produce leaf growth at the expense of flowers.

When a bulk manure is added to a bed it should be distributed evenly throughout the dug soil to ensure a good root development of the plants.

Green manure for the vegetable garden

Most people are anxious to grow their own vegetables fresh for the table, but a continuous succession of crops is exhausting for the soil of a vegetable garden unless there is a plentiful supply of cattle manure or compost to make good the loss. Accord-

[64]

SOIL AND MANURING

ingly, it is often better to concentrate on growing European vegetables in the cold weather, and to buy the Indian hot-season varieties in the bazaar when they are both cheap and plentiful.

When the vegetable plot is lying fallow during the hot weather is a good chance to add food to the soil by means of a green crop or green manure. Green crops are leguminous plants which have the property of taking nitrogen indirectly from the air through the agency of bacteria which are found on the nodules of their roots. This faculty enables *Leguminosae* to thrive in a soil poor in nitrogen.

Those green crops suitable for garden use are quick-growing annuals. They are cut down just before flowering and their leaves and lighter stalks are buried in the ground and their roots turned over, the whole thus providing organic matter and humus. Other advantages in growing green crops in vegetable gardens during the rainy season are that the soil is not exposed to and burnt by the sun, neither is plant food washed out of the soil.

A selection of green crops suitable for a garden in the plains includes cow peas (*Vigna catiung*), *dhaincha* (*Sesbania arcuata*), *matikalai* (*Phaseolus mungo*) and sunhemp (*Crotalaria jauncia*). The first is of a creeping habit whilst the others are erect.

The seeds are obtainable from any Government Seed Depot at small cost. Sow them with the early rain in rows which are 18 inches apart, at such a rate that a quarter of an acre takes about 10 pounds of seed. If the weather is dry, water daily. Just before flowering, cut the crop and bury it, including the soft stalks and roots but throwing away any hard and woody stems.

Green crops are ready to cut about 6 to 10 weeks from the time of sowing. They take another 6 to 12 weeks to rot in the earth, depending on the

[65]

THE GARDEN IN THE PLAINS

temperature, rainfall, lightness of the soil and hardness of the stems.

Plants from seed sown in the beginning of May should be ready for cutting from the middle of June to the middle of July, and the ground ready for general planting from the end of August to the end of September or later. If, however, conditions are too dry for sowing the green crop early, it will mean that the ground may not be available for cold weather vegetables until the end of October. In such a case it would be better to green manure half the vegetable garden one year and the other half the following year, so leaving an area available each year for the earliest cold season vegetables. In places where early rain is dependable, it is often possible to green crop the whole vegetable garden and for the ground to be ready in time for winter vegetables.

ARTIFICIAL FERTILIZERS

Bulk manures are the best general food for plants because the humus added to the soil improves the tilth in addition to providing plant food. Bulk manures act slowly and their effect in the soil is more lasting than artificials, which are concentrated and produce their results quickly. On occasion, however, during the later stages of growth, a tonic food may be needed and it is then that artificials are useful. They are particularly valuable when it is necessary to manure specially for leaf, or for fruit, or for root growth. It is a mistake, however, to depend entirely upon artificials.

The three important plant foods are nitrogen, phosphates and potash, and different fertilizers provide one, two or all three necessities.

Nitrogen may be given as sulphate of ammonia, nitrate of soda, calcium cyanamide (nitrolim), oil cake, blood meal and animal meal. Oil cake also

SOIL AND MANURING

contains some phosphates and animal meal carries some phosphates and potash. Superphosphate, basic slag, rock phosphates and bone dust are the commoner sources of phosphates, and muriate and sulphate of potash supply potash.

Some artificials act less quickly than others. The average gardener, however, relies upon cattle manure or compost for long-term manuring, and is inclined to look for quick results when using artificials. For all general purposes the three substances below may be used.

<i>Nitrogen</i>	— Sulphate of ammonia,
<i>Phosphates</i>	— Superphosphate,
<i>Potash</i>	— Sulphate of potash,

These substances are obtainable from manure merchants.

Bones contain lime and phosphorus, and make a good fertilizer. They act slowly unless ground to a bone meal or bone dust, when they act fairly quickly, according to the fineness. Bones often disseminate anthrax, so that before sale they are usually sterilized.

Although nitrogen, phosphates and potash are all desirable in a mixture, the proportion of each should vary according to the crop that is being grown. If leaf is wanted, the mixture should be rich in nitrogen; if seeds or fruit, it should be rich in phosphates and potash. The list below will give a rough idea of the broad principles of manuring with artificials.

Nitrogen for leaf; e.g. cabbage, lettuce, tobacco.

Phosphates for roots; e.g. carrots, turnips; and for legumes; e.g. peas, beans.

Potash and *phosphates* for flowers, for they increase the size and smell.

Potash and *phosphates* for fruits, tomatoes and cauliflowers. These manures increase the sugar content and hasten ripening.

THE GARDEN IN THE PLAINS

The following table shows the proportion by weight which should be taken of the three fertilizers for various crops. So, 4 pounds of sulphate of ammonia, 2 pounds of superphosphate, 1 pound of sulphate of potash will give 7 pounds of mixture suitable for plants grown for leaf.

CROP		SULPHATE OF AMMONIA	SUPER- PHOSPHATE	SULPHATE OF POTASH	AMOUNT
		PARTS BY WEIGHT			
Leaf	...	4	2	1	2 to 3 oz. mixture per square yard, or 1½ oz. per gallon of water.
Roots	...	2	3	1	
Flowers	...	2	2	1	
Legumes	...	2	3	1	
Fruits	...	2	3	1	
Fruit trees	...	2	3	1	¼ lb. per small tree, up to 4 lb. per big tree.
Grass	...	2	1	1	2 to 3 oz. per square yard, or 2½ oz. per gallon of water (6¼ oz. to a 2½-gallon can).

Add mixture when the plant starts strong growth, and water at the same time. Avoid flooding as the mixture is soluble and may leach out.

For manuring lawns with artificial manures, see the section on 'Fertilizers for grass' in the chapter 'Grass and Lawns'.

Lime

Lime is essential to all plants although some will not grow if it is present in large quantities. Lime sweetens sour earth and after a water-logged soil has been drained lime greatly increases its fertility.

Lime may be obtained as quick lime, slaked lime or limestone. Quick lime or burnt lime when made moist becomes hot and forms slaked lime. The latter if left in the air gradually turns to limestone. One part of quick lime is equal to one-and-a-third parts of slaked lime added to the soil. To make a stiff clay workable a dose of quick lime is desirable, but for general garden use crushed limestone is best.

In some parts of the plains lime is naturally present in sufficient quantity in the soil, and further additions are undesirable. In places where lime is naturally short, a dose of 5 or 6 ounces of powdered limestone per square yard may be sprinkled over the soil of flower or vegetable beds every two or three years in the off-season. Lime should not be added simultaneously with the manure mixtures mentioned above, but can be applied a month earlier. This is particularly important with sulphate of ammonia from which the lime liberates ammonia as a gas into the air, and nitrogen is thereby lost.

Hydroponics

Hydroponics, i.e. 'water work', is the name given to the practice of growing vegetables or flowers in water to which chemicals have been added. Water culture has been practised for many years in laboratories to gain information regarding plant response to various conditions. Recent experiments show that this practice can be extended to cover growing vegetables for food. Hydroponics will not take the place of working the soil where there is soil to work, but in

THE GARDEN IN THE PLAINS

crowded cities where growing space is limited, the practice of raising vegetables in water, chemically treated, may well come into its own.

At present the whole question is in the experimental stage, and there are many problems still to be solved from the ordinary gardener's point of view. The subject is one of general interest, however, so a rough outline of the process is given, based upon Mrs Hilyer's book *Hydroponics*.¹

The plants are raised in shallow tanks, 6 inches or so deep. A tray, consisting of a light wooden frame about 3 inches deep with coarse wire netting nailed to the under side, is fitted into the top of the tank. At each end of the tray there is a 'service' hole covered by a wooden lid. A layer of wood-wool shavings is spread over the tray, covered by a layer of dry moss. The wood-wool and moss help to keep the plants upright, to conserve moisture, and to provide darkness for the roots. The tanks can be kept upon a flat roof, along garden paths, or in a greenhouse.

Seeds are usually sown at the natural season for their germination. Small seeds are raised in moss over sand chemically treated, the seedlings being transplanted to the moss on the tray of the culture tank, and large seeds sown direct on the tray. Plants best suited to water culture are those with a high water and carbohydrate content. The leaves and stems grow upwards in the usual way, but need support as the plants are but lightly anchored in the moss. It is said that the plants can be placed somewhat closer together than is the case in soil, but not so close as to shut out the sunlight necessary for cropping, or for sturdy growth.

The water level in the tank is lowered from about 3 or 4 inches to 2 inches deep as the roots develop,

¹ A 'Pelican Special' published in 1940 by Penguin Books Ltd.

SOIL AND MANURING

leaving an air space just below the tray. The water is aerated daily by means of a syringe inserted through the service holes in the tray. Syringing also helps to diffuse the chemicals. Nutrients can be added in solution, or the chemicals put into glass jars with perforated lids and the jars placed on their sides in the water.

Plants need a number of elements for their growth, some of which—oxygen, hydrogen and carbon—are obtained freely from the air and water. Nitrogen, phosphorus, potassium, calcium, magnesium and sulphur are required in fair quantities, and these must be supplied to the plants. Other elements are necessary in traces, and these include iron, boron, zinc and manganese. There are many nutrient formulas because different plants have different needs. The weather is a factor to be considered, and the balance of the nutrient solution should be adjusted to suit a hot, sunny summer, medium weather, or a cloudy winter. Experiments are continuing as to the most satisfactory formulas.

Chapter iv PLANT PROPAGATION

‘How many buds in this warm light
Have burst out laughing into leaves!’
—W. H. Davies

~~~~~  
PROPAGATION BY SEED—Collecting and storing seed—Germination of seed—Sowing seeds—Nursery beds—Seed boxes—Care of seedlings—Transplanting—PROPAGATION BY CUTTINGS—How to prepare cuttings—How to plant—When to plant—PROPAGATION ALLIED TO CUTTINGS—‘Eyes’ and leaves—Division of rootstock—PROPAGATION BY LAYERS—How layers are made—Gootee or marcottage—PROPAGATION BY GRAFTING—Whip, saddle and cleft grafting—Crown grafting—Inarching or upright stem layering—Budding

**I**N nature, plants are generally reproduced by seed, but they may be reproduced vegetatively by cuttings. A common type of vegetative reproduction is by division of rootstock, such as is employed with perennials like Michaelmas daisies and pentstemons. Another kind of vegetative reproduction is by budding, where, for instance, a desirable kind of rose or fruit which grows rather feebly on its own root, is budded or grafted on to the sturdy stock of a closely related plant.

### PROPAGATION BY SEED

The ultimate object of a plant is to produce flower and seed. When seeds fail to set, it is usually because climatic conditions are not favourable, and this happens in some parts of India with ‘foreign’ plants, e.g. antirrhinum.

## PLANT PROPAGATION

### Collecting and storing seed

Seed should not be gathered from the plant till it is ripe as in many cases seed picked before it is fully ripe fails to germinate. Seed is not improved by lying on the ground and with precious seed it is sometimes worth while enclosing a nearly ripe seed box in a muslin bag so that the seed is collected automatically as it falls. ‘Foreign’ plants grown from seed collected in India year after year are apt to deteriorate, although some acclimatize and do well.

The period over which it is safe to keep seed varies. Seeds of annuals may be kept a year, cereals as long as two to four years, whilst some fruit seeds, e.g. mango and citrus, may only be kept a few weeks. Seeds for storage should be quite air-dry and kept in dry, airtight tins sealed with melted wax, for under such conditions they are able to withstand changes in temperature and will not germinate.

### Germination of seed

Flower and vegetable seeds vary in the time they take to germinate. Cosmos, zinnia and most other *Compositae* usually germinate in two or three days, and flax, candytuft and dianthus in five or six days. Stocks sometimes take one to three weeks; phlox, antirrhinum, verbena and pansy from two to six weeks. Larkspur and nemophila will not germinate until the nights are really cold, so it is not advisable to sow them too early in the season. Cynoglossum, anchusa and ladies lace may take from three to six weeks to germinate, and hunnemania and such perennials (usually grown as annuals if grown at all on the plains) from one to three months.

The germination of flower seeds is very erratic and the same kind will differ in time from year to year. Plants such as hunnemania may be very successful

[73]

#### THE GARDEN IN THE PLAINS

one year after quick germination, and the next take so long that the young plants are nipped by the scorching sun and wind before they get a chance to flower. Do not be in too great a hurry to throw away the earth from a box where seeds have apparently failed to germinate, for they may appear later.

With regard to vegetables, cauliflower, cabbage, turnip, kohlrabi, lettuce and radish are quick; parsley and New Zealand spinach take a little longer, whilst carrot and celery are usually the slowest to germinate.

Some seeds have very hard shells which retard germination and these must be softened to hasten the process. For instance, *Acacia arabica* seed is very hard and can be put in water as hot as you can bear to touch, and left for as long as twelve hours before sowing. Once the seed has been put into the hot water the latter can be allowed to cool naturally. Others do not need such a long soaking to soften their shells, the germination of the seeds of the heavenly-blue morning glory (*Ipomoea rubro-coerulea*) being hastened by soaking the seed in hot water for only an hour or so before sowing. With most nurserymen's seeds, however, germination for the garden is easy and rapid and the seed should be sown as soon as the packet is opened.

#### Testing seed

It is not usually necessary to test seed before sowing, although this may be done by germinating a few on wet flannel, when germination should take place in three to eight days with many small garden seeds. Good seed when split should be clear and creamy inside.

#### Sowing seeds

Seeds are usually sown in seed boxes or protected nursery beds, and the seedlings later transplanted to

#### PLANT PROPAGATION

their beds in the garden; or else they are sown direct in the beds where they are to remain, and the seedlings thinned out to avoid overcrowding. For seedlings that can bear transplanting, seed boxes or nursery beds are best, for it is then easier to give close attention to the young plants. Many flowers and vegetables, however, do not transplant successfully and these should be sown direct out in the beds.

#### Direct in the open

Flowers and vegetables which are better not transplanted should be sown in the beds which have been prepared by digging and manuring a full two months before the sowing season. Before putting out the seeds, dig the beds again and crumble the top to make a fine surface. If the weather is dry, water the beds so that the soil is just damp. Scatter the seeds widely and evenly over the beds to avoid overcrowding and waste, and cover them with finely sieved dry earth. Watch the beds carefully to see that the seeds remain covered and that the soil is not washed or blown off, leaving them exposed.

Seeds broadcast in beds are apt to be carried off by ants. A seed bed kept clean and free from weeds during the off season is less likely to be troubled by ants than one which is allowed to become weedy. (See the section 'Ants' in the chapter 'Pests and Diseases' for methods of dealing with these pests.)

#### In drills

Sweet-peas, peas, beans and radishes are best sown in drills and thinned out if necessary. Drills are shallow troughs made by drawing a stick along the bed. Drop in the seeds one by one, and smooth the earth over them carefully. Generally speaking, seeds should be covered with a layer of earth twice as deep as their own diameter.

## THE GARDEN IN THE PLAINS

### Nursery beds

Seedlings grown in nursery beds are sometimes sturdier than those reared in seed boxes, but against this advantage is the fact that small seeds are often carried away by ants, or the seedlings nipped off by grubs.

The soil should have been prepared some weeks before the sowing season by a thorough digging, and the addition of a little compost or leaf mould mixed throughout the dug earth. Cattle manure is not advisable in a seed bed because of the risk of introducing grubs and weeds. While the bed is empty the soil must be weeded and forked frequently to make it light and friable, and to expose any lurking chrysalids or eggs of insects.

Nursery beds are best raised about 9 inches above ground level. Some sort of shelter is needed for the young seedlings, and this can be made of loosely woven thatch attached to a light bamboo frame which is easily removable when the seedlings need more light. The shelter should rest at a slope on four supports, the lower edge being 2 to 3 feet from the ground, and the higher 5 to 6 feet. The wider opening should face the early morning sun.

Once the seedlings have their true leaves full light should be given them in the early morning and late afternoon, but in the hottest hours the shade can be replaced until the little plants are advanced enough to stand full sun all day. In districts where frosts are known, the shelter should be replaced at night, and kept there in the morning until the air is warmer. The damage from frost often results from the sun shining on plants which have recently been exposed to intense cold.

Before sowing seed the beds must be dug again and the top earth crumbled finely. Water the bed

## PLANT PROPAGATION

lightly, just enough to damp the soil without making it too wet. Cover the seeds with fine earth.

Nursery beds are excellent for holding cuttings, which usually develop better under controlled conditions.

### Seed boxes

Seed boxes may be shallow earthenware pans sold for the purpose, wooden boxes cut down to a depth of 6 or 7 inches with holes pierced over the bottom, or kerosene tins halved lengthwise and the bottoms perforated. Good drainage is very important, and a layer of small pieces of broken brick or potsherds placed with the hollow sides downwards, should be spread over the drainage holes before the boxes are filled with the special compost.

#### Compost for seed boxes

- 2 parts light garden soil, sieved
- 1 part clean fine sand
- 1 part sieved mature compost or leaf mould

The ingredients must be well mixed together and sieved again. The easiest method of sifting the materials is to pass them first through a sieve with a No. 6 mesh, and then through another sieve with a No. 12 mesh.

Many gardeners pour boiling water over the compost for the seed boxes to kill off any grubs or insect eggs. If this is done, allow the soil to dry again before filling the boxes. Other people literally bake the soil by placing it on a sheet of tin over a small fire. Baking certainly kills the grubs and weeds in the earth, but if carried to excess the soil will become sterile as the organic matter will be destroyed.

When sowing time comes, smooth over the earth in the boxes evenly and damp it slightly. Scatter the seeds as thinly as possible, and cover them lightly with some of the prepared compost. Very small seeds

## THE GARDEN IN THE PLAINS

can be distributed more evenly if they are mixed with a little fine sand.

If seed boxes are to be kept on a veranda or under the eaves, choose a south-east aspect for them, as morning sun is best for the seedlings. The boxes should be kept on the edge of the veranda, for if they are too far inside the house the seedlings become lanky and bend towards the light. Each box should be raised off the floor on stones or bricks.

**Care of seedlings**

Before germination and during the very young stages of the seedlings the seed boxes or nursery beds should be shaded during the day, but once the first pair of true leaves have appeared the plants must be gradually accustomed to more and more light, especially in the early morning, until they can stand sun in all but the hottest hours. Sickly seedlings without backbone or strength nearly always owe their weakness to lack of light or overcrowding.

Seedlings should be pricked out<sup>1</sup> into other seed boxes or seed beds as soon as they are big enough to handle if there is any sign of overcrowding, or if the first seed boxes are likely to be too shallow for the roots of the seedlings. Once they have strengthened again and when six leaves have appeared, they can be moved to their beds in the garden.

If seedlings are very overcrowded and seem too frail and thin to handle for pricking out, it is advisable to thin them out drastically so that the plants left in the box are 1 to 1½ inches apart. Those lifted will be thrown away, but it is better to sacrifice some seedlings and be fairly sure of saving the few that are left, than to risk losing the lot through 'damping off'.

<sup>1</sup> Pricking out means lifting crowded young seedlings and replanting them in more spacious quarters.

*'Damping off'*

The disease known as 'damping off' is due to a fungus or other infection gaining a hold on young seedlings which have been weakened by overcrowding or careless watering. If seedlings are left in too dry soil and then watered heavily they nearly always damp off, and if the seeds are sown too thickly the whole box of seedlings may be lost.

*Watering*

Seedlings should be watered every evening, although on damp, grey days in humid districts this may not be necessary. The compost for seedlings is very light, however, and should be watched against drying out. It is as well to test the dampness of the earth below the surface with your finger. Always use a proper seedling watering-can which gives an even, misty spray. See that the water reaches the corners of the box or nursery bed and penetrates deeply enough to find the roots, without soaking the soil unduly.

**Transplanting**

Before transplanting any seedlings see that the bed which is to receive them has been dug thoroughly and the top-soil crumbled finely. Days of light, showery rain are good for transplanting, but if the weather happens to be dry see that the beds are watered before the seedlings are planted out.

Transplanting to the beds is best done in the evening or late afternoon. Each plant must be at a suitable distance from its neighbour, and if the bed is to be filled with one kind of flower or vegetable, the seedlings are best placed triangular fashion in rows. See that the tap-root of each plant is straight in its hole and the side-roots are not crushed down. *Malis* are sinners as a rule when it comes to trans-

#### THE GARDEN IN THE PLAINS

planting, folding the tap-root or crushing the laterals in an attempt to force the plant into a hole too small for it. A little supervision at this stage is well worth while. It is not good to plant the seedlings too deeply, and the upper-roots should be just below the surface of the ground. Use a dibble for making the holes for the seedlings.

After planting, press the soil down lightly but firmly round the collar of the seedling. Light shade is necessary after transplanting, but should be removed once the young plants stand strongly again. Small branches of leaves stuck firmly into the earth at a slant between the seedlings usually provide enough shade.

In some cases where trees and shrubs are grown from seeds, the seedlings are just pricked out singly into small, loosely woven baskets, 8 to 10 inches high and 4 to 5 inches wide at the mouth, and later the whole basket is placed in the plant's final home. The baskets rot away by the time the roots need more space. Sometimes the seeds are sown singly direct in the baskets, which are inserted into the ground when the seedlings are a few inches high.

Transplanting more than once checks the growth of a plant, so if it is necessary to keep the plants dwarfed, they are usually moved two or three times before being finally placed. This practice is common for a flower like the dwarf ageratum; otherwise it is apt to become leggy and taller than it should be. Plants that are not to be dwarfed should never be transplanted more than once after pricking out.

#### PROPAGATION BY CUTTINGS

It is often quicker to reproduce trees, shrubs and other plants by cuttings than by other methods. A cutting will usually give a plant truer to the parent strain than a seed, for with the latter there is always

#### PLANT PROPAGATION

the chance of a throw-back, whereas by using cuttings the type can be chosen exactly because we can select it on sight.

#### How to prepare cuttings

Cuttings flower earlier if taken from young wood, and the upper shoots of a plant are best for producing fruit and flower quickly. Low side shoots can make healthy plants but are slower to bloom and are sometimes shy of fruiting. Moribund or hide-bound wood is never good, and a shoot must be 'lively' to succeed. The age of the wood to be chosen, however, varies somewhat with the type of plant. *Duranta*,

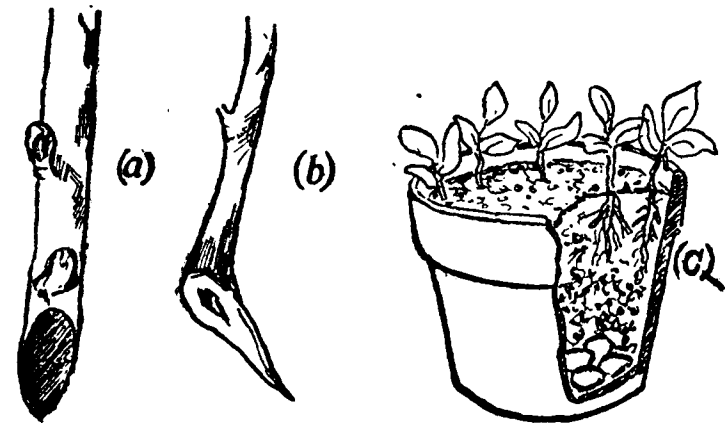


FIG. 10. CUTTINGS

- (a) Cutting without heel, cut just below a leaf bud  
(b) Cutting taken with a heel  
(c) Small cuttings struck in an earthenware pot

for instance, strikes quickly from cuttings of very young wood and even thin green shoots, whilst other plants, such as the grevillea, succeed better from fully matured wood. Speaking generally, it is safest to use medium to half matured wood of a year's growth for the majority of plants.

Cuttings can vary from pencil-thickness to thumb-

## THE GARDEN IN THE PLAINS

thickness, according to the age and type of wood selected. Those from trees or shrubs can be 8 or 9 inches in length, cut at a slant just below a leaf bud or node (see Fig. 10 a). Cuttings that are too long are apt to dry out and perish. All the leaves should be stripped off except a leaf bud near the top of the cutting.

If ordinary cuttings fail, tear off a small branch so that a piece or 'heel' of the parent stem and bark is torn away with it (see Fig. 10 b). Cuttings from a small plant such as the carnation should not be longer than 5 or 6 inches.

**How to plant**

Cuttings from hardy trees and shrubs can be placed in a shady and protected corner of the garden in a well-dug bed of fairly light soil. More delicate cuttings are better planted in a shaded nursery bed. In hot, dry districts all cuttings should be in a protected bed.

Cuttings from shrubs or trees should be planted at a slight slant with about a third of their length in the soil, each cutting far enough from its neighbour to be lifted easily when it has struck. Short cuttings from small plants are better placed upright with an inch of their length beneath the ground. The soil must be pressed down firmly round each cutting.

Delicate cuttings from small or precious plants are best struck under glass, in a specially prepared light compost.

*Light compost for delicate cuttings*

- 2 parts clean sand
- 1 part sieved leaf mould
- 1 part powdered charcoal

Small delicate cuttings are best planted in an earthenware pot, in a circle quite close to the rim. The empty compost in the centre is watered rather

than the actual cuttings, the moisture spreading down towards the sides and the lower ends of the cuttings. A bell glass can be placed over the top and the pot itself sunk up to the rim in the earth to prevent evaporation of moisture from its walls.

**When to plant**

Cuttings are best put down towards the end of the parent plant's dormant period, just before active growth takes place. In the case of plants that grow best in the cold season, they should be cut right at the beginning of the cold weather. For the general run of tropical shrubs and trees, cuttings are best taken at the end of the dry weather just before the early rains are due. They should be put in a shady and protected spot and watered lightly until the rain comes, so that the wood does not dry out.

Cuttings may take some weeks before they strike roots, those from quick-growing plants striking more readily than those from woody, slow growers. Sometimes shoots sprout straightaway, but this usually means that the cutting is drawing upon reserves within itself. This premature activity must not be confused with the growth which follows the formation of new roots.

## PROPAGATION ALLIED TO CUTTINGS

**'Eyes' and leaves**

Some plants may be reproduced by taking buds or 'eyes'. Cut a wedge about 1 inch long sloping inwards, from a lively shoot containing an eye or bud swelling with a small leaf attached. Bury this in moist sand with the bud just showing, and cover with a bell glass. Orange trees are sometimes reproduced this way in Europe. When the eye has sent out root and shoot and is growing well, it can be transplanted.

#### THE GARDEN IN THE PLAINS

A few plants, e.g. begonias, can be propagated from leaves which are partly buried in damp sand. These eventually bud and root to form new plants.

#### Division of rootstock

A large number of plants can be propagated by division of their rootstock. Under this heading come those plants which grow in clumps. Many perennials, such as Michaelmas daisies and pentstemons, are reproduced by division, pieces of their rootstock with stems or shoots attached being pulled apart and replanted to form new clumps. Orchids are generally divided for propagation, and division is the quickest and easiest method of reproducing most ferns.

Most tuberous plants, such as cannas, tuberous begonias and the like, are propagated by division. Clusters of lily bulbs are broken up, and although this is not, strictly speaking, division of the actual rootstock, the term division is often used.

Some plants, e.g. bananas, send up suckers from their roots. The sucker and part of the root is detached and planted with care. This is similar, in a way, to division of the rootstock.

Root suckers should never be used from grafts, as they will be shoots of the stock (in the case of roses, for instance, perhaps the common briar) instead of the grafted scion. (See the sections on grafting.)

Some plants send fine 'runners' along the ground which put down roots at intervals, the runners connected with the parent plant eventually rotting. A good example of this is the strawberry. Many grasses reproduce by runners, as do plants such as the creeping periwinkle (*Vinca minor*).

#### PROPAGATION BY LAYERS

Layers are slower than cuttings, but are often successful when the latter fail. By layering, a branch

#### PLANT PROPAGATION

is partly severed from the parent plant and induced to throw roots at the cut. Eventually the layer is separated from the parent.

#### How layers are made

To layer a plant, select a ripe and pliable branch, bend it downwards and on the underside of the bend at ground level cut it halfway through just below a leaf bud. Slit the branch upwards at the cut towards

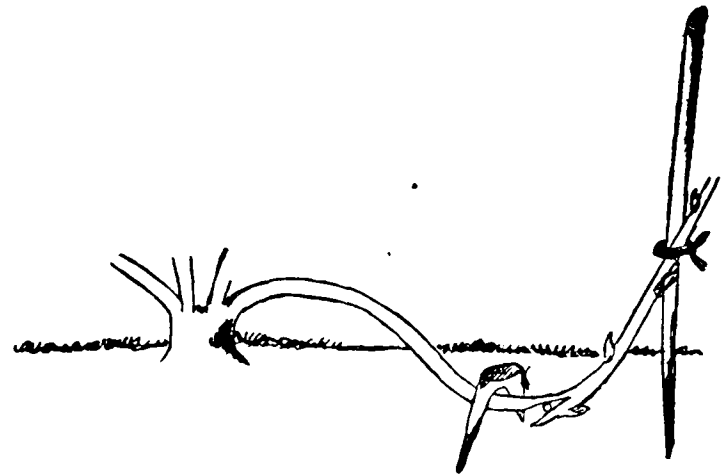


FIG. 11(4). LAYERING BENEATH THE GROUND

the tip of the branch for an inch or so, thereby forming a tongue with the leaf bud at its tip, and keep this open by inserting a matchstick or a piece of gravel. The branch is then pegged into the soil with the cut buried 2 to 3 inches according to the size of the branch. A second peg is sometimes necessary on the other side of the tongue (see Fig. 11 a). The soil should be well dug before pegging down the layer, and kept moist and shaded.

#### THE GARDEN IN THE PLAINS

If the branch is too stiff to be bent to the ground, the layer may be pegged into a hollow section of bamboo, slotted at the top to allow the branch to pass through it, or through a pot filled with sand and

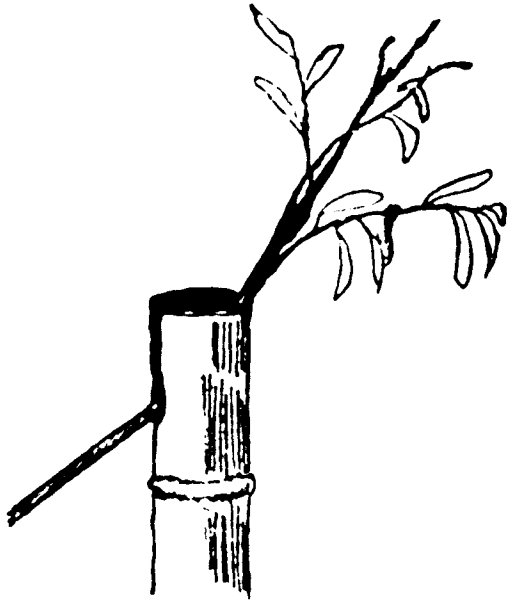


FIG. 10(b). LAYERING INTO A BAMBOO

a prepared compost (see Fig. 11 b). If a pot is used, it will be necessary to support it on a temporary platform.

When the layer shows signs of rooting, it can be cut from the parent in easy stages by making a notch in the parent stem, which is deepened every day or so until the branch is gradually cut through. With small plants like carnations it is not necessary to cut through gradually.

When layering is done in the spring, roots may form in the rains and the plants be lifted in the

#### PLANT PROPAGATION

autumn, but layers from very slow-growing trees or shrubs may take much longer.

#### Gootee or marcottage

This method of layering is commonly used in China and India, and is popular for fruit trees such as the litchi.

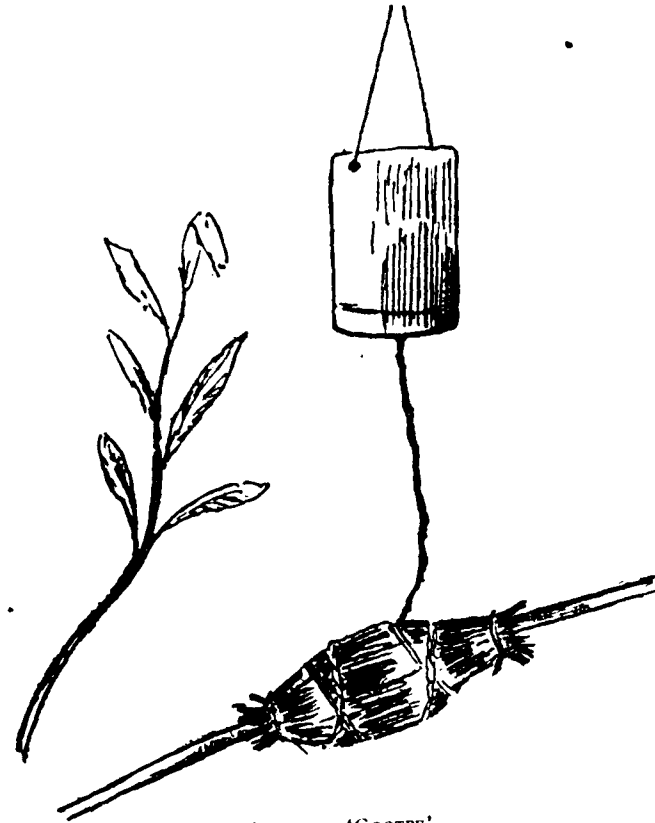


FIG. 12. 'GOOTEE'

*Gootee* being kept moist by means of a wick

As before, a good ripe branch is taken and either a tongue is cut below a bud, as described above, or the

#### THE GARDEN IN THE PLAINS

bark is removed in a ring 1 inch wide directly beneath a bud. Surround this ring and the bud above it with a ball of sandy earth about 4 inches in diameter and bind with coconut fibre. Water the *gootee* in dry weather or keep it damp by means of a wick (see Fig. 12). When rooting begins the *gootee* may be progressively severed from the parent as described for ordinary layers. It may take as long as four to six months to obtain a rooted *gootee*.

#### PROPAGATION BY GRAFTING

Grafting is commonly used for certain fruit trees, for grafted trees come into bearing sooner than seedlings and often bear heavier crops if suitable stocks are selected. In some cases a fruit tree or a rose may grow weakly or slowly on its own roots, whereas when it is grafted on to the sturdy root of some related form, e.g. a delicate rose on to a hardy briar stock, growth will be rapid and strong.

It is usual to buy grafts from a nurseryman, and amateurs seldom find it necessary to do any grafting themselves. The budding of roses is interesting and worth trying oneself, however, and it is also interesting to try different forms of grafting.

Grafting consists of uniting one part of one plant with that of another. In order that the two parts of the graft shall unite, the plants must be related and of the same natural vigour, and the union must be made at the cambium or growing layer of the two parts.

A graft consists of two parts, the stock and the scion. The stock includes the root, whilst the scion is the introduced upper part of the graft which is to bear the fruit or flower.

Grafting is best done in moist growing weather, and when accomplished the grafts must be kept shaded until stock and scion have fused. It is important to

#### PLANT PROPAGATION

exclude air from the junction, and this is usually done by smearing the joint with grafting wax after it has been bound with raffia.

##### Grafting wax

6 parts crushed resin  
6 parts beeswax  
1 part tallow

Melt the tallow in an iron vessel over a low fire, then add the beeswax. When the mixture begins to boil, gradually add the resin and stir until it has melted. Boil for five more minutes, then strain the mixture through a cheese cloth into an old basin of cold water. Let the mixture cool thoroughly and then knead it until it becomes firm and doughy. Should the mixture stick to the hands, grease them by rubbing with a little tallow. The grafting wax can then be rolled into balls and is ready for use.

Melted paraffin wax alone will answer the purpose, but it is not as good as the mixture given above.

In the tropics modified forms of grafting such as inarching or tongue-approach grafting are used more commonly than the straightforward grafts popular in cooler climates.

##### Whip, saddle and cleft grafting

*Whip* grafting is the simplest and most common type of graft, although it is said to succeed better in cooler places than in the tropics.

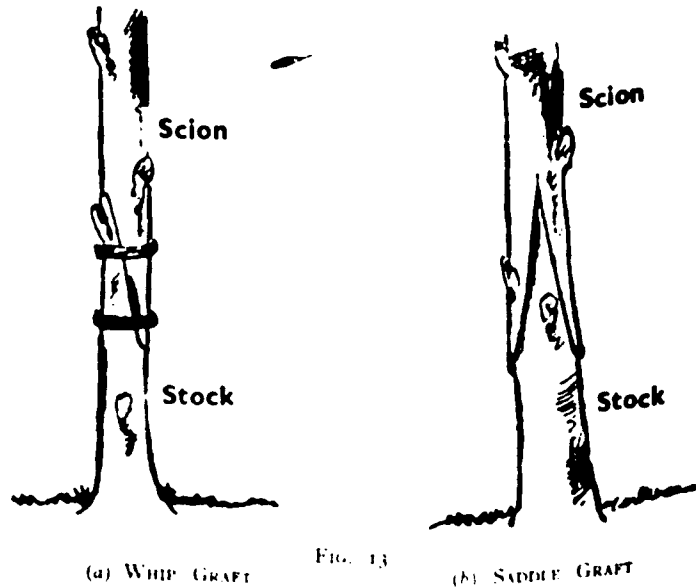
Both stock and scion must be of equal thickness and approximate age. The stock should be of one- or two-year wood, and should be cut about 6 inches from the ground, the end pared to a slope, with a flattened point and hip. The lower end of the scion is similarly cut to fit neatly on the stock. Place together, bind with tape or raffia, and cover the junction with grafting wax (see Fig. 13 a).

A *saddle* graft resembles a whip graft except that

[ 89 ]

## THE GARDEN IN THE PLAINS

a wedge-shaped end of the stock is fitted into a corresponding notch on the scion. Both stock and scion should be of the same thickness. This method is often used for shrubs, and the stock is cut about 6 inches from the ground (see Fig. 13 *b*).

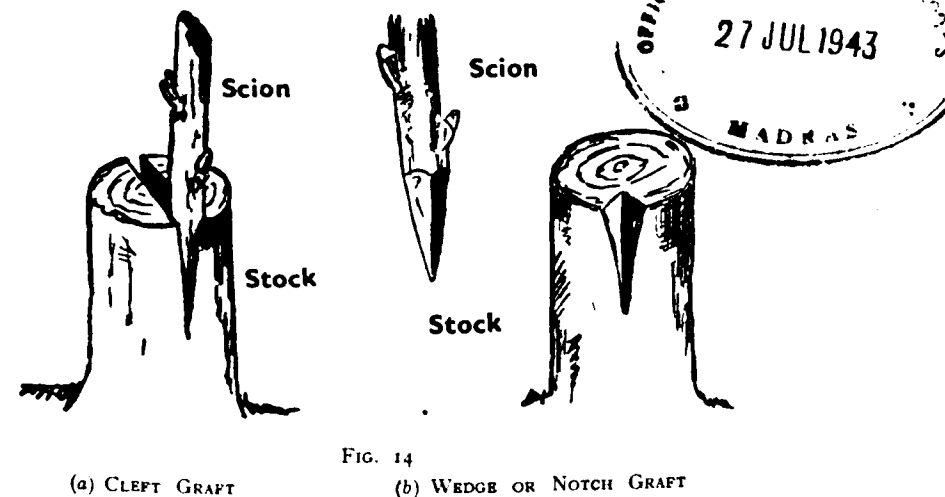


*Cleft* grafting is suitable when the stock is old or thicker than the scion. The stock may be sawn off 8 to 12 inches above the ground, and then cut to a wedge-shaped cleft with a saw. The end of the thinner scion is also cut wedge-shaped. Slip the scion into the opening on the stock near the side, being careful that the inner barks of both scion and stock meet. Often two scions are used, one on each side of the cleft. Some care must be taken in binding this graft, and Firminger recommends using waxed paper under the raffia, over the large slit (see Fig. 14 *a*).

[ 90 ]

## PLANT PROPAGATION

*Wedge or notch* grafting resembles cleft grafting in principle, and is illustrated in Fig. 14 *b*.



## Crown grafting

Crown grafting is suitable for renovating an old tree and is usually attempted in the growing season when the bark separates easily from the wood underneath. Saw the stock 8 to 12 inches from the ground. Make a shallow slit down the bark and gently open the slit by turning back the bark, insert the scion and bind carefully. On a large tree use sacking and cowdung paste instead of raffia and grafting wax for binding. Often several scions are inserted in the stock if the tree is big (see Fig. 15).

There are variations and many fine points of grafting not mentioned here, because they belong to the nurseryman's craft rather than the amateur gardener's sphere.

[ 91 ]

## THE GARDEN IN THE PLAINS

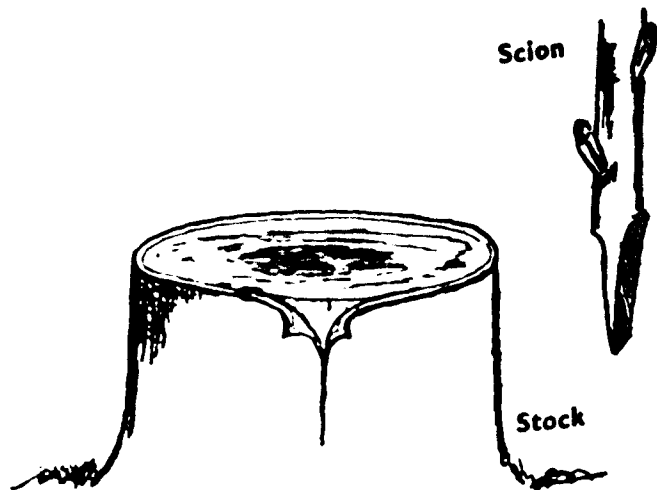


FIG. 15. CROWN GRAFT

### Inarching or upright stem layering

This form of grafting is popular for fruit trees, and is the most generally used type of grafting on the plains.

Take either a one- or two-year old seedling or rooted cutting and establish it in a pot. This is the stock. When well established, slice away about 2 inches of the bark and some thin wood behind it on one side of the stem, and then do the same to a stem of about the same thickness on the tree which is to provide the scion. Carry the stock in its pot and support it close to the prepared stem of the scion, and bring together the treated parts of the two stems so that they are face to face. Bind them firmly and cover the joint with grafting wax. In two or three months the parts should have fused, and it will be possible to start the process of severing the scion from the parent and of heading or cutting back the stock. This

## PLANT PROPAGATION

should be done slowly, deepening the cut gradually as mentioned for layers. Keep the graft in a cool and shady place until sufficiently established to be transplanted to the ground (see Fig. 16).

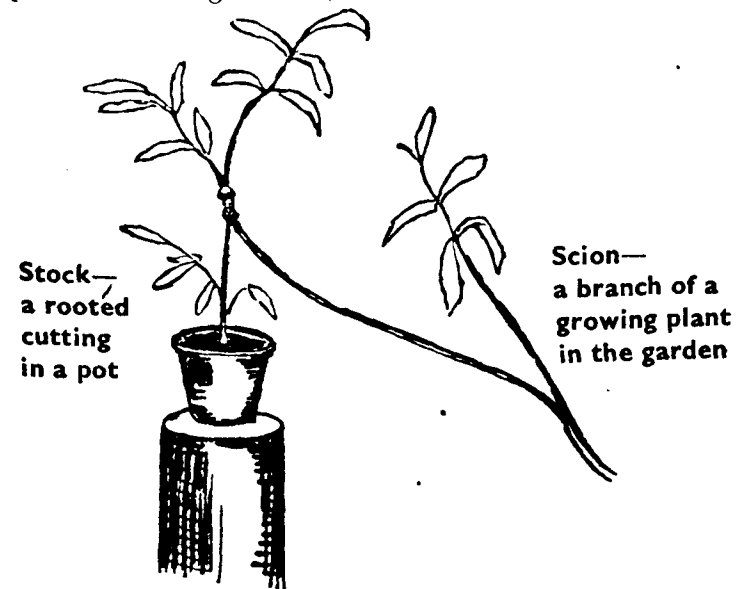


FIG. 16. INARCHING OR UPRIGHT STEM LAYERING

Note how the stock in its pot is supported close to the scion branch on the tree

*Tongue-approach* grafting is a form of inarching where a tongue is cut in both stock and scion, and the two fitted together.

### Budding

Budding is sometimes employed with fruit trees, such as the peach, and very often with roses. Budding is a kind of grafting, in which an 'eye' or bud of one plant together with a piece of the surrounding bark is inserted into a stem of another plant.

Budding is an interesting process and a simple one once you have the knack of handling the delicate bud,

#### THE GARDEN IN THE PLAINS

and the knowledge to select branches of an age and at a time when the sap runs freely and the bark separates easily from the wood. The tools needed for budding consist of a budding knife, raffia and a tin of water. In addition to the cutting blade, a budding knife is supplied with a bone blade which is used for manipulating the bark. The process of 'T' budding is dealt with in the chapter on 'Roses' and is illustrated later in Fig. 20. The general principle used with roses is applicable to the budding of other plants.

#### Chapter v

### PRUNING

'Superfluous branches

We lop away, that bearing boughs may live.'

Shakespeare : *King Richard II*

Why pruning is necessary—When to prune—How to prune—  
Types of pruning

#### Why pruning is necessary

IF certain fruit trees and rose bushes are left to grow naturally they tend to produce a matted growth and many twiggy, blind shoots. Most of the energy of the plants runs to vegetative growth and the fruit or flower becomes small and inferior. By pruning a tree or shrub its vigour is concentrated into a few branches which will yield of their best. Correct pruning keeps a plant young and lively, increasing its productive period.

In moist districts a plant growing naturally collects a mass of mosses and lichens on the wood and the latter becomes moribund and hide-bound. Such wood does not produce new shoots easily, and since it is often the new shoots which bear blossom and fruit, it follows that a choked, moribund plant is an unproductive one. The removal of useless twigs and foliage lets air and sunlight into the plant.

In some cases we prune to shape a plant, to convert a small tree into a shrub, or to make certain creepers bushy in form. Vigorous creepers and some shrubs of wild growth can only be controlled by drastic pruning once or even twice in a year. In other cases pruning must be resorted to to remove diseased

## THE GARDEN IN THE PLAINS

branches, when it is necessary to cut back to live wood.

### When to prune

The best time to prune evergreen shrubs that have their vigorous growing and flowering period in the hot months, is in the cool, dry season when growth is at the minimum and the sap runs low. Generally speaking, January is a good month. Shrubs that bloom in the cold months can be cut back soon after their flowering period is over, and the majority of deciduous plants pruned about a month after leaf fall.

Immediately after pruning the plant suffers a setback before new growth starts. It is therefore necessary to start pruning operations before the spring growing period, so that the inevitable shock is over by the time vigorous new growth begins. If pruning is done just at the growing time it often happens that the spring impulse is thereby lost, and growth is slow until the autumn fast-growing period. On the other hand, early autumn pruning is bad because the new growth which appears is arrested in the natural dormant period of the dry weather, and die-back often results. An exception to this rule is the rose, which is usually pruned about the middle of October.

Never carry out pruning operations if there is a bad drought, or when strong, scorching winds are prevalent.

Plants recently transplanted should not be pruned, for the double shock often causes death.

The above notes refer to pruning in general. For details regarding the pruning of fruit trees, roses or special shrubs, reference should be made to the chapters on these subjects.

### How to prune

(1) In pruning, use a sharp pruning knife and cut

## PRUNING

the wood cleanly at a slant, if possible about half an inch above a bud. The top of the slant should be at the outside of the plant, so that in pruning it is necessary to walk round the bush or shrub, always drawing the knife outwards.

(2) Remove all dead wood or snags, cutting the latter back to live wood. Remove superfluous shoots, blind shoots which have already carried fruit or flowers and are not needed as a frame to bear new wood.

(3) When pencil-thick wood is cut, this will usually throw from near the cut. When thicker branches are cut some die-back is inevitable and the dead snags so formed must be cut off next pruning time. When thick wood is cut, it is an advantage to smear the cut over with a paste of mud and cowdung, so encouraging callus formation and reducing the drying-out effect and subsequent die-back.

Spring and summer flowers usually come on this season's new growth, so that next year this wood, which has borne flowers, may be cut away, unless it is needed as a frame to bear new wood for this season's flowers.

Every plant does not require drastic pruning, but cleaning, by cutting out dead wood and interlacing growth, is always desirable. Good judgement is essential in pruning, for it must be remembered that heavy cutting produces vegetative growth, so that if a fruit tree is too severely pruned the result may not be extra fruit, but vigorous leaf and shoot growth.

Pruning is a shock to a plant and in many cases the rootlets die back after pruning. Hence the more healthy and vigorous the plant the better it will stand up to pruning, whilst a sickly plant may be killed by the knife. In dealing severely with weak, moribund plants drastic pruning often amounts to a case of kill or cure.

### Types of pruning

#### Thumb-nail or finger pruning

This is really heading-back shoots by plucking off two or three leaves from the tips. Disbudding, as employed with carnations, chrysanthemums and so on, is a form of finger pruning.

#### Heading-back

This means that the upward growth of a plant is cut back to induce a spread of branches below the cut.

#### Cleaning

This means cutting out dead wood, blind shoots and twiggy interlacing growth. Plants that will not stand even light pruning will benefit by occasional cleaning.

#### Light pruning

This is slightly more drastic than cleaning, for it includes not only the removal of twiggy growth, but the cutting back of wood of pencil thickness.

#### Heavy pruning

This consists of cutting back thick wood which forms the frame of the plant. Plants such as the shrub *Caesalpinia pulcherrima* will stand heavy pruning and shoot vigorously afterwards.

#### Pollarding

This consists of cutting off the top of a tree so that it forms a plume-like growth, often seen in willows.

#### Root pruning

Root pruning is sometimes carried out if a fruit tree is shy of bearing, for very free rooting makes for vegetative growth at the expense of flowers and fruit. For a description of this process see the paragraph on pruning in the chapter 'Fruits'.

## Chapter vi

# PESTS AND DISEASES

'Fat caterpillars drift around  
And Paradisal grubs are found.'

—Rupert Brooke

PREVENTIVE MEASURES—How to keep plants healthy—ANIMAL PESTS—INSECT PESTS—The life cycle of an insect—INSECTS AND INSECTICIDES—Biting insects—Grubs—Crickets—Piercing and sucking insects—Borers—Ants—Small pests other than insects—Fumigants—FUNGI, FUNGUS DISEASES, ETC.,—Fungus sprays and washes

THE plant world is constantly being attacked by enemies, either in the form of animals or insects which are commonly known as 'pests', or by fungi, usually referred to as 'blights'. Both insects and fungi appear to come and go in waves. Some years climatic and other conditions are favourable to the development of these garden enemies. The next year perhaps, due to no precaution on our part, the attack of the same pest or blight may be so mild as to pass unnoticed.

### PREVENTIVE MEASURES

Insect pests are always with us and the breeze carries fungus spores into the garden, so there can be no question of eliminating a pest or blight. The most we can do is to try to control the trouble both directly and indirectly. By indirect control is meant preventive measures as opposed to the direct control which deals with the actual destruction of the pest or blight.

## THE GARDEN IN THE PLAINS

A healthy plant is often practically immune from the attack of blights. Therefore the best way of preventing disease is to keep all the plants in the garden in good fettle.

### How to keep plants healthy

Perhaps the most important factor in maintaining the health of plants is good cultivation. By this means, the earth is kept open and friable, pans<sup>1</sup> are avoided and there is no root restriction. Good drainage and the avoidance of water-logging are also included in good cultivation.

Another benefit of good cultivation is that the chrysalids of many insects which develop in the soil are thereby disturbed and destroyed, and so the pest does not reach maturity. A clean soil is less liable to harbour insects than a weedy one. Land that has been covered with wild growth and is being cleared for a crop, should be well dug and 'disinfected' by burning light vegetation and rubbish strewn over the surface.

If the same kind of vegetable crop is grown in the identical place year after year, so making the same demands upon the soil each season, weak and vulnerable plants may result. For that reason it is best to change or rotate the crops yearly.

Proper manuring helps to strengthen a plant and increases its resistance to disease. Bulk manures such as cowdung or compost are best, although by their use there is a danger of introducing the grubs of insects. To avoid this, mature and sift the manure before using it on flower and vegetable beds.

Care must be taken not to overdo the application of chemical manures such as sulphate of ammonia, as an overdose may render a plant liable to fungus attack.

<sup>1</sup> Soil pans are layers of pebbles or hard clay-like strata a few inches below cultivation level, and these must be broken by forking.

## PESTS AND DISEASES

Dead wood on a plant is a source of infection in that it harbours fungi. Dead branches of trees or shrubs must be cut back to live wood, and withered leaves collected and burnt. Wounds on trees should be attended to at once, for they often let in fungus diseases, especially in hot, moist climates. (See the chapter on 'Trees'.) Never leave a dead plant to rot in the soil. A tree stump may give trouble, and if the surrounding plants appear sick the stump should be uprooted immediately.

Excessive shade for sun-loving plants, or too much sun for those that like shade, makes for general weakness. It is important to consider a plant's liking for sun or shade before fixing its home in the garden.

## ANIMAL PESTS

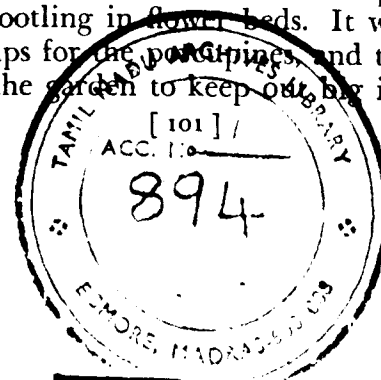
Animals are not usually much menace to the garden. Birds, flying foxes and squirrels are the enemies of fruit trees, and the only safeguard is to net the tree. If bulbuls or other birds are playing havoc with ornamental berries such as those of duranta or the small-flowered blue potato creeper, a bitter spray of quassia water may be used. This spray should not be used on fruit trees as the bitter taste is difficult to get rid of.

### Quassia water

6 oz. quassia chips  
3 gallons water  
3 oz. soft soap

Soak the quassia chips in some of the water for 24 hours, then strain. Dissolve the soft soap in a little hot water, then add to the quassia extract. Make up the quantity of water to the total of 3 gallons, with cold water.

Porcupines, and in some districts wild pig, can work great havoc rooting in flower beds. It will be necessary to set traps for the porcupines, and to put a firm fence round the garden to keep out big intruders.



## THE GARDEN IN THE PLAINS

Goats and cows can be a fearful nuisance, stripping the leaves off the branches of trees and shrubs or rubbing off the bark, and again a strong fence or thorny hedge round the garden, with gates that shut firmly, are the only protection.

Rats are often a problem, and it is essential to get rid of them as quickly as possible. The only really satisfactory way of achieving this is by employing a rat-catcher or baiting traps. Arsenic and other poisons are dangerous to pets and to ignorant humans as well as to rats, and Cyanogas fumigant (see the section on 'Fumigants' in this chapter) needs a special pump and a certain outlay.

## INSECT PESTS

Insect pests are usually far more formidable in a garden than animals, and as they are nearly always with us in some form or other we need to be constantly campaigning against them. In order to deal with insects systematically, some knowledge of their life cycle is helpful.

### The life cycle of an insect

All insects at some time during their existence undergo a change in form, a typical life history being divided into four stages.

- (1) The egg stage, or period of formation.
- (2) The larval stage, or period of growth (grub, caterpillar, or maggot).
- (3) The pupal or chrysalid stage, a period of transmutation or change. This is a resting stage and there is no feeding.
- (4) The adult stage, or period of reproduction. Butterflies, beetles, and flies are adult insects.

The life of a butterfly is an example of this cycle. The insect begins as an egg, from which it emerges as a larva, the familiar caterpillar, and enters its first stage of active life. Food is eaten and the larva develops,

## PESTS AND DISEASES

undergoing several moults. Then comes a resting stage, the chrysalid, during which the organs of flight and reproduction are developed. This is in a sense a dormant period for no feeding takes place. Finally the adult insect, the butterfly, emerges. Most true insects follow the general line of change although cockroaches, grasshoppers, crickets and locusts miss the chrysalid stage and emerge from the egg looking very like the adult except that they are smaller and usually without wings. Each moult brings them nearer to the adult form.

Insects differ from each other in the larval stage. A maggot, the larva of the common fly, has no legs; the grub, or larva of a beetle, usually has three pairs of legs near the head, whilst the caterpillar has eight pairs.

At the egg stage the insect does no direct harm, but if the eggs are ever found they must be destroyed as forerunners of trouble to come. Eggs are usually laid in secret places, although they are sometimes found on leaves and can then be destroyed easily.

The larval stage is the most dangerous, since all insects are destructive during this feeding period of development. Caterpillars should be hand-collected and destroyed whenever found, but there are means of poisoning them and these will be described later.

The pupal phase is non-feeding and therefore usually unnoticed. Many insects pupate in the soil, so that turning the earth exposes or destroys the chrysalids and breaks the life cycle.

Not all insects are directly destructive in the adult stage. Butterflies and moths do practically no damage to plants then, but, of course, they are busy laying eggs and consequently trouble for the future. Beetles, grasshoppers, scale insects and bugs, however, are definitely as destructive as in the larval stage.

Normally, indirect preventive measures, such as turning the soil to destroy eggs and chrysalids, and

## THE GARDEN IN THE PLAINS

hand-collecting any stray insects, are all that is necessary. Suddenly, however, we may notice that seedlings are being nipped off just above or below the ground, shoots are wilting or leaves being wholly eaten or left as mere skeletons. It is then that direct action must be taken.

## INSECTS AND INSECTICIDES

The way we tackle the problem of insects directly will depend upon the manner in which the pest is feeding. If it is biting the leaf, like a caterpillar or beetle, a stomach poison can be used. On the other hand, if the insect pierces the plant and sucks the juice from inside, a stomach poison on the surface of the plant is of no use, and we must rely upon what is known as a contact poison which actually harms the insect's body. Below are descriptions of insects and their forms of attack, together with formulas for the insecticides suitable.

### Biting insects that eat leaves (beetles, caterpillars, grasshoppers)

These need a stomach poison, such as lead chromate, purchased either as a dry powder or a paste. The paste, when fresh, makes a better spraying mixture than the powder, but is apt to cake unless kept carefully. Two lead chromate sprays are described below, one made from lead chromate itself, and the other from lead acetate and potassium bichromate. DO NOT USE THESE POISONS ON VEGETABLES.

#### Lead chromate spray No. 1

- 1 oz. lead chromate powder
- or
- 1½ oz. lead chromate paste
- 4 gallons water

Spray the solution on to the plant with a garden syringe.

[ 104 ]

## PESTS AND DISEASES

### Lead chromate spray No. 2

- (a) 1 oz. lead acetate
- 3½ gallons water
- (b) ½ oz. potassium bichromate
- ½ gallon water

Mix the solutions and lead chromate is produced. The mixture may be sprayed on the plant as it is.

In the case of food plants shortly for use, such as cabbage or lettuce, a poisonous spray like lead chromate is undesirable, and a naphthalene emulsion can be used instead. This is made as follows.

### Naphthalene emulsion (for use on vegetables)

- (a) 6 oz. size
- 1 lb. soft soap
- 1 gallon hot water

Dissolve the size and soap in the hot water.

- (b) 2 lb. naphthalene
- 2 gallons kerosene

After having dissolved the naphthalene in the kerosene, add to the first solution. Stir, and if short make up to 3 gallons with water. The emulsion is sprayed on the plants, from which it will evaporate in a day or so, having in the meantime destroyed the pest.

Some caterpillars live in the soil and come out at night to ravage the plant. A 'poison bait' is sometimes useful, and such a one is made as follows.

### Stomach poison bait

- 2 oz. lead chromate
- 4 oz. crude sugar
- 1 pint water
- 5 lb. bran

Dissolve the lead chromate and sugar in the water, then mix well with the bran. Place in small heaps near the affected plants.

[ 105 ]

## THE GARDEN IN THE PLAINS

### Grubs that bite beneath the soil

If grubs are doing damage within the soil by biting roots, the top earth surrounding the plants may be removed for an inch or so and replaced with soil treated with a weak disinfectant solution made as follows.

#### Disinfectant solution

1 part creosote or phenyle  
20 parts water

The top-soil is then replaced.

Wire worms are the larvae of various kinds of beetles. They live on the roots and stems of plants, attacking just under the earth, and flourish in soil that has not been dug or cultivated. An application of the disinfectant solution mentioned above and frequent forking of the earth will help to control them.

### Crickets

These also do their damage below or just above the ground by nipping the stems of young seedlings and tender plants. They are not dealt with through stomach poisons, however, but by direct flooding of their holes. Often little powdery heaps of earth are to be seen on the grass or in flower beds. Examination will probably show that these heaps mark small holes, usually in pairs, a foot or so apart, which are the front and back doors of a cricket's dwelling. Make a weak disinfectant solution, as detailed above, mixed in a watering can. Take off the rose of the can, and pour the solution in a steady stream down one of the holes, while the *mali* waits near the other hole to catch the cricket as he is flooded out. It may take a certain amount of trial to find out which two holes belong to the same dwelling.

## PESTS AND DISEASES

### Piercing and sucking insects (bugs, thrips, aphids, scale insects)

Here follow some useful 'contact poisons' for sucking insects.

#### Hard-soap kerosene emulsion

½ gallon kerosene  
2 oz. soap  
5 gallons water

The soap is dissolved in ¼ gallon boiling water, and the kerosene added to the warm liquid and violently agitated for 10 minutes, the mixture being kept warm meanwhile. The remainder of the water is then added and the emulsion is ready for use when quite cold.

#### Soft-soap kerosene emulsion

1 quart soft soap  
2 quarts hot water  
1 pint kerosene oil

Dissolve the soft soap in the hot water. Add the kerosene and churn or pump the mixture until it is creamy. Then add an equal amount of water to the emulsion and it is ready to use when cold.

Aphids (plant lice) are apt to attack rose bushes, their presence being indicated by blotchy leaves and a stickiness on the stems. A good spray is phenyle-kerosene emulsion.

#### Phenyle-kerosene emulsion

2 parts phenyle  
1 part kerosene  
50 parts soap suds

The size of the utensil used to measure a 'part' will depend on the amount you want to make.

Ordinary hard- or soft-soap kerosene emulsion as mentioned above (without phenyle) is effective, and more suitable for cauliflowers, turnips, fruit trees, etc. when they are attacked by aphids.

Another useful spray for aphids, thrips, etc. is tobacco water.

## THE GARDEN IN THE PLAINS

*Tobacco water*

½ lb. country tobacco (cut tobacco leaf from the bazaar)  
4 gallons water  
4 oz. soap

Boil the tobacco in 1 gallon water, strain, then dissolve the soap in the tobacco solution. Add 3 gallons water and use when cold.

**Borers**

When a little pile of powdery material is seen below a woody stem it is probably due to the presence of a borer beetle. Run a wire down the hole the borer has made in the stem to kill the insect inside, then plug the hole with a dab of tar. Often borers have departed when much material is piled outside the hole.

If a bush is riddled with the shot-hole borer, then the affected branches will probably die and must be cut back to live wood.

**Ants**

Ants can be a great nuisance, running off with seed, and they are especially fond of those of lettuce and carrot. Mix a little turmeric (*huldi*) with the seed if it is to be broadcast in open beds. Another preventive measure is to put saucers of sweet oil or treacle near where the seed is sown, as a counter attraction and a sticky death for the ants.

White ants or termites usually attack dead wood, and the best preventive is to paint wooden posts with some preservative, and to tar or earth-oil the underground parts of the post in addition. Some kinds of termites attack live wood, and it is said that the extract of neem leaves boiled in water and sprayed on the bark is effective. Cyanogas, a fumigant described later, is sometimes used for white ants.

**Small pests other than insects**

The red spider (a mite) sucks leaves. The quassia water formula mentioned earlier, to which is added half a pound of flowers of sulphur, can be used. Another suitable spray is the fungicide lime-sulphur, mentioned in the section on 'Fungus Sprays and Washes'.

Eel worms (nematodes) attack the roots of plants, forming knotty galls about the collar. The affected plants should be destroyed, and when possible the soil should be turned over and treated with the disinfectant solution mentioned earlier. Liming the soil is also a help. Another cure is the use of carbon bisulphide (see following section on 'Fumigants'). Liability to eel worm attack is reduced if the soil is left under clean fallow for some months before it is planted.

Snails and slugs can be a nuisance, eating the leaves of trailing plants in a fernery. Dusting the foliage with lime may help, but the best remedy is hand-collection of the offenders.

**Fumigants**

In addition to stomach and contact poisons there is a third class of insecticides known as fumigants. These substances depend on their power to suffocate the insect. Carbon bisulphide and naphthalene are often used to keep weevils out of grain. Cyanogas, a powder which in contact with moisture produces a poison gas, is sometimes used against rats and white ants. This needs a special pump for distribution. The average gardener, however, seldom finds it necessary to use fumigants.

In the case of eel worms or nematodes (see above), a fumigant may be necessary. In badly infected plots all the plants should be destroyed and the soil opened up. Carbon bisulphide, at the rate of 3 ounces per square yard, can be placed in holes about a foot deep

## THE GARDEN IN THE PLAINS

and a foot apart, the holes being filled up with the earth again, with the object of diffusing the gas from the chemical throughout the soil.

## FUNGI, FUNGUS DISEASES AND OTHER PLANT TROUBLES

Fungi are very low forms of plant life which live on other plants or on dead vegetable matter. They spread over their host by means of web-like filaments and extract from it the food on which they live. Individual filaments are invisible to the naked eye, but a mass of them is visible and when seen on the plant gives the characteristic appearance of the disease. The filament grows as it feeds, penetrating into the leaf, stem or root of the plant.

When conditions are favourable the fungus filament produces spores which float away on the breeze or are carried by animals or ourselves and deposited elsewhere. If the new location is favourable the spore develops a new filament, and the destruction of another host begins.

Dampness, warmth and shade, favour the growth of fungi, whilst sunlight and dryness are generally unfavourable to the spread of fungus disease.

If fungus disease attacks the root of a plant, the latter usually wilts and the leaves hang as on the dead branch of a tree. (This wilting must not be confused with that of a plant suffering from drought, for then it usually discards its leaves as a precaution against undue loss of moisture, and grows fresh ones when conditions are again favourable. This is quite different from the wilting caused by disease.)

When a plant has root disease the whole must be dug up and destroyed, for there is no cure. The space occupied by the plant should be exposed to the sun and isolated by a trench if other plants are nearby. Many root diseases travel through the top-

## PESTS AND DISEASES

soil, so that complete removal of the infected plant and isolation of the patch by a trench is very necessary.

When a branch is attacked by a fungus it should be cut back to healthy wood and the dead material carefully burnt.

Leaf diseases are common and can be recognized by spots and patches which result from the action of the fungus filaments. Mildews, rusts and leaf spots are groups of diseases which are common, and which may kill the plant eventually if left untreated. Bordeaux and lime-sulphur solutions are both general fungicides.

In addition to fungus diseases there are also physiological diseases which result from an upset of the usual plant processes. These may produce a dwarfed plant, a variegated or a crinkled leaf. Sometimes a plant will outgrow these abnormalities, but if it does not, the only thing to do is to remove it, open up the soil and replant with new stock.

Mosses and lichens are higher forms of life than fungi and are not parasitic, but they batten on plants and incapacitate them, although they do not feed upon them directly. In misty places mosses and lichens give trouble, and they may be removed by rubbing, after which a lime-water spray or wash helps to liven up the moribund bark.

### Fungus sprays and washes

Fungicides should be applied from a sprayer which gives a fine spray, in the evening when the sun has lost its strength.

### Lime-water

Lime-water checks the growth of mosses and at the same time softens the bark, thereby encouraging healthy growth.

10 lb. quick lime

5 gallons water

Dab on the tree or shrub with a brush or swab.

## THE GARDEN IN THE PLAINS

### *Lime-sulphur*

This is an excellent spray for most fungus diseases of the leaf and stem, and is also used against mites. It may be purchased and diluted according to instructions, or it can be made from lime-water and sulphur. The making is, however, a tiresome process.

Lime-sulphur is best sprayed with a special sprayer but if this is not available a brass motor syringe may be used. The solution may not be used in copper machines. Sprayers must be washed thoroughly after using. Lime-sulphur is made as follows:

- 1 lb. quick lime
- 1 lb. 2 oz. flowers of sulphur
- 2½ gallons water

The lime should be put in a vessel capable of taking 2½ gallons, and slaked by adding a little water gradually. When fully slaked make up to 1½ gallons and bring to the boil. When boiling, add the sulphur, stirring vigorously. When the sulphur has been added, bring the mixture up to 2½ gallons and boil for an hour, keeping at the 2½ gallon mark by adding more boiling water. This gives a stock solution which may be diluted with 10 times its volume of water to make 25 gallons of the spray.

### *Bordeaux mixture*

Perhaps this is the most useful fungicide for the garden. Bordeaux mixture also acts as a tonic to the plant and to some extent protects it from insect attack. It is advisable to spray fruit trees with the mixture regularly once a year, about the time of the spring rains. Bordeaux mixture is made as follows:

- (a) 1 lb. 1 oz. crystallized copper sulphate
- ½ gallon water

Dissolve the copper sulphate in the water, in a wooden or earthenware vessel.

- (b) ½ lb. quick lime
- 20 gallons rain or soft water

Slake the lime, put into a tub with 20 gallons water and leave it to settle and clear. Run off 14½ gallons of the clear lime-water and mix it with the copper solution (a). Make the mixture up to 16½ gallons with soft water. This solution may not be kept in iron vessels, and it should be

[ 112 ]

## PESTS AND DISEASES

used from a brass spray. Store in earthenware jars or wooden casks.

### *Burgundy mixture*

Burgundy mixture resembles Bordeaux and can be used for the same purposes, but sodium carbonate (soda) is used in place of lime.

- (a) 5 lb. copper sulphate
- 2½ gallons water

Dissolve the copper sulphate in water, in a wooden or earthenware vessel.

- (b) 6¼ lb. washing soda
- 2½ gallons water

Dissolve the washing soda in the water. Add very gradually to the copper solution (a), testing for acidity from time to time (see acidity test below). When the right litmus colour has been obtained, the mixture should be diluted with more water up to 50 gallons. Spray from a brass syringe or sprayer. Store in earthenware vessels or wooden casks.

### *Acidity test (for Burgundy mixture)*

Take a piece of red litmus paper (get this from a chemist), and dip it into the solution to be tested. The colour of the paper should turn faintly blue, and if this is not obtained add a little more soda. A strong blue colour is not desirable since it means that the solution is too strongly alkaline, and may scorch the leaves of the plant.

### *Methylated spirit*

When one or two plants only are lightly affected with a fungus disease, it is not worth while going to the trouble of buying or making special spray fluids. Instead sponge the diseased leaves with a little methylated spirit, diluted with water in equal quantities.

[ 113 ]

PART THREE



TREES, SHRUBS AND  
PERMANENT GARDEN FEATURES



## Chapter vii

### TREES

‘Who does his duty is a question  
Too complex to be solved by me,  
But he, I venture to the suggestion,  
Does part of his that plants a tree.’

—J. R. Lowell

Planting trees—Care of trees—Flowering trees for the garden—  
Colourful jungle trees—Ornamental foliage trees—Medium to  
large densely shady trees—Large trees with lighter foliage—  
Very big trees—A selection of trees for avenues—Unusual trees—  
Beautifying waste land

ONE of the great advantages of gardening in India is to be found in the rapidity with which many trees grow, for in the wetter districts a sapling may become a considerable tree in six or seven years. Most gardeners prefer to plant saplings, if obtainable, rather than grow trees from seed or layers, since their use means a gain of one or more years. If trees are planted from seed, these must be put out in a nursery bed and the usual care taken of the seedlings with regard to watering, shading, thinning out, and so on. (See the chapter on ‘Plant Propagation’.)

#### Planting trees

When planting trees dig a hole at least 3 feet deep and 3 feet in diameter or, if the soil seems particularly poor, 4 feet deep and across. Refill the pit with earth, and to every six baskets of soil add one heaped basket of very old cow manure or compost. Too much or too fresh manure is not desirable for young trees. When the pit has been filled to a few inches

## THE GARDEN IN THE PLAINS

above ground level, water it so that any sinkage of the loose earth will take place before the tree is planted. A raised bed makes a good 'stage' for a tree or shrub, but in very dry places the bed should be slightly hollowed to minimize the loss of moisture.

After the soil in the pit has settled and dried, make a hole large enough to take the ball of earth round the roots of the plant. If a young tree has been moved locally, a large clod of earth should be left round the roots when the plant is lifted; but if it has been sent from a distant nursery, it will have travelled in a pot or basket, and its roots will arrive bent and must be straightened gently.

The tap-root should be straight in the hole when the tree is planted and the collar of the plant level with the top of the pit. Water the tree and press the earth down firmly round the collar.

The best time for planting trees is at the beginning of the rains, but if the young plants are moved in dry weather they must be shaded until the monsoon breaks.

With a bare piece of land to plant out, the tendency is to plant too many trees, for it is difficult to visualize the space they will occupy when fully grown. The roots of big trees are greedy, and where space is limited it is as well to plant sparingly because other plants cannot stand up to their competition. One shady tree spreading graciously at the end of a lawn is suitable for a smallish garden or, if space permits, a group of flowering trees. In very big gardens, park-like effects with clumps of trees and leafy corners are very attractive.

### How far apart to plant

When grouping trees the final effect, perhaps only to be realized after you have left the bungalow, should

## TREES

be taken into consideration. Small-growing trees such as *Gliricidia maculata* and *Bauhinia*, should be grown 16 to 20 feet apart, and larger trees from 20 to 25 feet, or even 30 feet, according to their full size.

### Care of trees

Staking during the early stage of a tree's growth helps to develop a straight trunk, and also prevents a young tree from being wind-wrung. Split plantain fibre is useful as a binding material if raffia is not available, and a small pad of cloth should act as a buffer between the fibre and the plant. Avoid using string or wire which may cut the bark.

In dry, hot weather, newly planted trees must be watered from time to time, but too heavy watering is definitely injurious. Light shade and protection from wind are necessary for them. A good screen can be made by putting a tall ring of stakes round the plant and wrapping dried grass thinly outside the stakes; or a lean-to grass screen can be erected near the tree on the side from which the prevailing wind blows.

Young trees may be shaped by cutting away those lower branches that are likely to be too near the ground later, and as the tree grows light interlacing branches can be removed to keep the frame clear. Many trees can stand quite drastic pruning, and in a few cases large-growing trees may be headed back at 16 or 18 feet to keep their size within bounds and to alter their general habit. As a rule, however, garden trees are selected on account of their natural grace and suitability, and it should not be necessary to prune them.

Do not let grass grow up to the bole of a tree until it is quite big. Fork the bare earth at the foot of a young tree occasionally.

## THE GARDEN IN THE PLAINS

Strong winds often leave a trail of damage behind them in the way of broken branches from big trees. When this occurs the stub of the branch should be sawn smooth, or if it is broken near the trunk it should be cut level to the tree. Dead or cankered branches should also be cut in the same way. Wounds left by broken or cut branches give access to disease, and to prevent this the end of the stub may be tarred, or else plastered with a paste of mud and cowdung. Many fast-growing trees are liable to canker if the mature wood is wounded and within a year or two the tree may die. The driving of a nail into the trunk has been known to start a canker which eventually killed a tree.

### Flowering trees for the garden

#### *Amherstia nobilis*

This is one of the most beautiful of flowering trees, but as it likes a moist atmosphere it is not suitable for dry provinces. It is a medium-sized tree and the flowers appear in February-March, drooping from the branches in graceful sprays of scarlet and gold. The young leaves hang down in limp brownish clusters which contrast effectively with the dark green of the mature foliage. Soil should be rich. Usually propagated by layers or gootees.

#### *Bauhinia*

A pretty tree known sometimes as the Camel's Hoof Tree on account of the split leaves which are joined at their base. Flowers are white, pale mauve-pink or raspberry-pink. *B. triandra* and *B. purpurea* flower in October-November, and *B. variegata* in a leafless condition in February-March. It is a small- to medium-sized tree, but flowers when quite young and is fairly quick-growing. A good tree for lining a garden drive although it is rather untidy when the leaves fall. Raised from seed.

#### *Brownea*, or West Indian Mountain Rose

*Brownias* are best grown in moist districts.

*B. ariza* is a small, spreading tree with large clusters of rose-red flowers appearing in March-April. It can be propagated by layers which flower in about seven years.

## TREES

*B. grandiceps* is larger than *B. ariza*, and has dense heads of red flowers. Its young leaves droop in clusters in much the same way as do those of *Amherstia*.

#### *Callistemon lanceolata*, or Australian Bottle-brush Tree

This tree is of small growth. The flowers are scarlet brush-like tufts which appear on and off most of the year, but mainly in the rains. The leaves are stiff and narrow. Propagated by seed.

#### *Cassia*

*Cassias* are usually raised from seed, and are ornamental both as to flower and foliage.

#### *Pink Cassias*

*C. grandis*, the Horse Cassia or Pink Shower. This is a medium-sized, spreading tree with dark green leaflets which have a russet tinge at the tips when young. The leaves drop in December-January, the tree bearing its rose-pink flowers in a leafless state in February-March. This *Cassia* is the first to bloom in the year.

*C. nodosa*, or the Pink Mohur as it is sometimes called, is found mainly in humid districts. It is a most graceful, spreading tree of medium height, with light, feathery leaflets drooping from the branches. Its beautiful pink flowers appear between April and July, and are followed by long cylindrical seed pods. Stake the young trees for a time, otherwise the trunk may have a tendency to lean over later.

*C. javanica*, the Javanese Cassia, closely resembles *C. nodosa*, except that it is a somewhat smaller tree, the flowering period is a little shorter, and the leaflets are rounder in form with blunt tips. The tree is rather short-lived. Suited to humid districts.

*C. marginata*, the Red Cassia or Roxburgh's Cassia, is a small tree not exceeding 20 feet in height as a rule, bearing deep reddish-pink flowers from May to early July, when it is extremely beautiful. Suited to moderately dry regions.

*C. renigera*, the Burmese Pink Cassia, is a small tree growing about 20 feet high. It grows in rather dryer places than does *C. nodosa*. The pale rose-pink flowers appear from May to July.

## THE GARDEN IN THE PLAINS

### Yellow Cassias

*C. fistula*, the Indian Laburnum, the Pudding-pipe Tree or the *Amaltas*. This is suited to moderately dry districts although it will thrive in more humid places provided the site is well drained. The leaflets are larger than with other *Cassias*, being from 2 to 4 inches long. The young foliage is of a most refreshing green, but later the leaves deepen in tone. It is a small, erect tree, of slow growth. A shower of the loveliest golden flowers streams from the branches throughout May and June, and hence the name Indian Laburnum. The long pods which follow have earned the tree the alternate name of Pudding-pipe Tree. The tree is sometimes deciduous for a short while in March, the new leaves appearing almost immediately.

*C. siamea* is a good timber tree, and bears pale yellow flowers on and off throughout the year. It is sometimes used for lining avenues, but is not nearly so showy as *C. fistula* or *C. multijuga*.

*C. multijuga* (*C. calliantha*) is a small- to medium-sized tree with feathery foliage, the leaflets being pale green above and whitish below. This *Cassia* is the last to flower, and bears masses of beautiful yellow flowers in August-September, while it is in full foliage. It is fairly quick-growing, and is a tree suited to moderately dry regions.

### *Cochlospermum gossypium*, or Yellow Silk Cotton Tree

This tree thrives in dry, rather rocky localities, so it is particularly suited to places where moisture-loving trees are ruled out. It is not very attractive when not in flower, but in bloom during February it is a beautiful sight with its expanded yellow flowers. The tree is dwarf in growth and is deciduous, the flowers preceding the new leaves. The large globular seeds contain a silky floss.

### *Colvillea racemosa*, or Colville's Glory

A tall tree with attractive light foliage and orange-yellow flowers appearing round about August. The leaves resemble the Gold Mohur in appearance. Suitable for moderately dry regions. Easily grown from seed.

### *Cordia sebestena*, or Scarlet Cordia

A useful tree for a small garden, for it is of dwarf habit and compact growth. Bunches of orange and red flowers

## TREES

appear mainly in the spring, but also on and off throughout the year. The leaves are wrinkled and rather rough. Propagated by seed or cuttings.

### *Dillenia indica*

An evergreen tree growing about 35 feet high, with big, handsome, deeply-veined leaves. In June and July it bears fragrant white flowers 5 or 6 inches in diameter, followed by large round green fruits. Suitable for humid tropical climates. Propagated by seed.

### *Erythrina parcelli*

A small, quick-growing tree with variegated green and cream leaves, and bright orange-red flowers. Easily grown from cuttings.

### *Gliricidia maculata*, Madre Tree or Mother of Cocoa

This is a small, quick-growing tree, often used as shade for cocoa. It has long feathery branches, the leaves of which drop in February and give place to sprays of pale pink flowers. Several of these trees should be grouped together, each 16 or 18 feet from its neighbour, against a setting of lacy foliage to get the full effect of the pretty pale blossoms. The tree can stand pruning and shaping to keep it dwarf. Easily raised from seed or cuttings.

### *Guaiacum officinale*, or Lignum Vitae Tree

This tree is not often seen, and as it is slow-growing it would not be planted by gardeners who want to see results quickly. If there is a specimen found already planted in a garden it should be greatly appreciated, for the tree is very lovely in the early spring when it is covered by a profusion of blue flowers. Height generally about 35 feet. Grows well in Bombay, and should succeed in moderately dry places. Usually raised from seed.

### *Haematoxylon campechianum*, or Logwood Tree

A dwarf tree only 10 or 12 feet high, suitable for a small garden. It has small, bright leaves and little yellow scented flowers appearing in February-March. Often grown as a tall hedge or wind-break. Propagated by seed or cuttings.

### *Holarrhena antidysenterica*, Ivory Tree or Conessi Bark

A small tree bearing white fragrant flowers in the hot season. The bark is of value medicinally. Propagated by cuttings.

## THE GARDEN IN THE PLAINS

### *Jacaranda*

*J. mimosaeifolia* is a tree of rapid growth with lacy foliage and beautiful blue flowers which appear at various seasons but most prolifically between February and May. Height 40 to 50 feet. Although it can be grown in climates like that of Assam, it flowers more abundantly in somewhat drier parts.

*J. micrantha* has larger leaflets and big sprays of purple flowers. Easily raised from seed.

### *Kleinhovia hospita*

This tree is particularly suitable for a small garden as it is of quick growth and neat, dwarf habit; but it is only for humid districts. The young foliage is of a delightful fresh lettuce green, and the frothy pink flowers resemble those of the creeper *Antigonon*, appearing usually in July and August. After flowering, ornamental seed pods appear.

### *Lasoensia vandelliana*

A small tree, or very big shrub, with smooth, glossy leaves and crinkly creamy-yellow flowers appearing round about December.

### *Lagerstroemia*

*L. flos reginae*, Queen's Flower or Pride of India, is a fine tree that bears very beautiful mauve flowers from May to July or August. The flowers vary somewhat in the shade of mauve, sometimes verging on a mauve-pink, or even a clear rose-pink. This tree can grow tall but has the advantage of flowering when the size of a shrub. The leaves turn red and fall in February or March, to be followed by the new leaves in early April. It is a good boundary tree for a medium-sized garden, and in the large garden one or two in a corner of the lawn make a lovely splash of colour. The tree loves moisture and is often found on river banks. Grown fairly easily from seed.

*L. thorelli* resembles the above, but it blooms later and the flowers last until September.

### *Melia azedarach*, or Persian Lilac

These trees are often used to screen slow-growing trees and are cut out when the important trees assert themselves. The foliage is very pretty and rather like that of the ash. Pale lilac sweet-scented flowers appear in March, and the tree is leafless in the cold months. Easily and quickly grown from seed, particularly in the more humid parts of India.

## TREES

### *Michelia champaca*

A medium to large tree with creamy flowers which are very sweet-scented, appearing at the beginning and end of the cool season. The tree is evergreen, and the foliage attractive.

### *Peltophorum ferrugineum*, Yellow Gold Mohur, or Rusty Shield-bearer

This tree bears spikes of golden flowers twice a year, in the early hot months and again in September-October. It has pretty feathery leaves and is of a spreading habit. The tree grows quickly and is said not to kill grass growing under its shade. Height 40 to 60 feet. Easily raised from seed.

### *Poinciana regia*, Flamboyant, Gold Mohur, Peacock's Tail Tree, or *Gul mohr*

A most brilliant tree with scarlet-orange flowers borne in masses from March to June. A rapid grower with delicate foliage and a graceful spreading form. Its brilliance is apt to kill the beauty of other trees near by and it should not, for instance, be grown close to the pink-flowered *Cassia nodosa*, as their blooming periods more or less coincide. I have seen a lovely group of Gold Mohur and *Peltophorum ferrugineum* (which has yellow flowers), but it is a difficult tree to reconcile with others in a small garden. It is apt to be damaged in strong winds, grass does not do well under its shade, and it usually has a leafless period before flowering. Not really suited to small- and medium-sized gardens.

### *Pterocarpus indicus*, Padouk or Senna

A large-growing timber tree which bears sweet-scented yellow flowers in March or April. It is only suited to really big compounds, or parks.

### *Saraca indica*, or Asoka Tree

A small evergreen tree sacred to both Hindus and Buddhists. Of slow growth, it is not common in gardens, but the tree is very ornamental with its red and orange flowers which appear in February-May. The leaves are limp and red while young, like those of *Amherstia*, but later turn a rich green, and are smooth with slightly wavy edges.

*S. cauliflora* grows bigger, and is a handsome tree when in flower, with dense heads of scarlet blooms which somehow seem rather gross.

## THE GARDEN IN THE PLAINS

### *Solanum macranthum*, or Potato Tree

This is probably the only member of the potato family to take the form of a tree. A small tree 20 to 35 feet high with deeply cut leaves and large pale blue-mauve flowers. In bloom most of the year in places with a mild winter. Propagated by seed or cuttings.

### *Spathodea*

*S. campanulata*, Scarlet Bell or Fountain Tree, is very tall and only suitable for big compounds. The flowers are open and look rather like over-blown tulips from a distance and are of a brilliant flame colour. They appear in the hot season and the tree is then a gorgeous sight. It is called the Fountain Tree because the buds squirt water when pressed. Raised from cuttings, root suckers or seed.

*S. nilotica* is of somewhat smaller growth, and the flowers are of a brighter orange-red.

### *Tecomella undulata*

This is a useful small tree for dry districts where the choice of flowering trees is limited. The leaves are grey-green with wavy edges and rather rough in texture. The flowers are yellowish-orange, appearing in March-April.

### *Thespesia populnea*, Portia Tree, Bhendi Tree, or Porash

An evergreen tree with glossy dark foliage and wide yellow flowers rather like those of a hibiscus, which appear on and off throughout the year. Not very showy, but the tree is of neat growth and suitable for avenues in medium-sized gardens. Height 30 to 40 feet. Easily raised from seed or cuttings, and is of quick growth. Most often seen near the west coast in the south of India.

### Colourful jungle trees

The following four trees, although extremely beautiful when in flower, are not altogether ornamental enough to choose for a garden. If they are already planted, however, they are worth retaining, and they are most desirable for beautifying waste lands.

## TREES

### *Bombax malabaricum*, Silk Cotton Tree, or *Simul*

A tall upright tree, with candelabra-like branches growing high up and more or less at right angles to the trunk. This is not the tree to choose for a garden, for although it is a quick grower it is too large and gaunt for any but a park-like compound. It is untidy, too, because the leaves fall before the flowering period; then the flowers drop off and carpet the ground below; and finally the seeds burst open and a quantity of soft white floss drifts and settles all over the garden. This floss is often used for stuffing cushions. If, however, there is already a cotton tree in your garden, leave it there. In January-February it is a glorious sight with its large red flowers clustered on the leafless branches. It will also serve as a support for certain showy and rampant climbers.

### *Butea frondosa*, Flame of the Forest, or *Palas*

A tree growing from 20 to 35 feet high. When not in bloom it is not ornamental as the leaves are rough and rather grey-looking. It flowers in a more or less leafless condition, bearing stiff bunches of brilliant orange flowers in February and March. In those dry months the tree is one burning mass of orange, colouring the smoky-blue landscape of the grasslands or low jungles.

### *Erythrina indica*, Dadap, or Indian Coral Tree

This is a medium-sized tree with conical prickles on the branches. It bears numerous narrow bright scarlet flowers from March to May, and is a popular tree with birds during that time. There are several varieties more desirable for gardens than the *indica* type. *E. parcelli* which has already been described (p. 123) and *E. alba* which has white flowers.

Some varieties of *Erythrina* are used as shade for crops such as tea and coffee.

### *Sterculia colorata*

A straight tree which can grow to a height of 40 or 50 feet. Its leaves are usually shed in November or December, the new ones sprouting in April or May after the plant has flowered. The tree seems ablaze when it comes into bloom from March to April or May, the flowers looking like branches of red coral from a distance.

**Ornamental foliage trees**

*Artocarpus*

*A. incisa*, or Breadfruit Tree, has large, handsome, deeply cut leaves, and bears a rough-coated, gross-looking fruit. It grows quickly to a height of 50 or 60 feet. The tree has an exotic, tropical charm, but is rather overpowering for small gardens. Suitable for moist climates.

*A. cannoni* (*A. laciniatus*) is a small- to medium-sized tree, the young leaves of which are a lovely red-bronze. Strikes a deep note among massed green trees, but is of rather slow growth.

*Filicium decipiens*, or Fern Tree

An evergreen tree of medium size. It is slow growing, but has ornamental fern-like leaves, and is suitable for most gardens.

*Grevillea robusta*, or Australian Silky Oak

So called because the timber has a resemblance to that of the oak. It is an evergreen tree of conical shape, the leaves being much divided, with silvery undersurfaces. The flowers appear in March-April and are old-gold in colour, but as they are apt to appear very sparingly the tree merits inclusion in the foliage section instead of under flowering trees. While young the tree makes an ornamental pot plant for the fernery. When full-grown it is an untidy tree because of leaf fall, but it is useful as a windbreak or shield because of its rapid growth. If the tree grows too tall it can be pollarded with success.

*Salix babylonica*, or Weeping Willow

This tree is very graceful, and will grow in some parts of India near water.

**Medium to large densely shady trees**

*Diospyros embryopteris*

An evergreen tree of spreading habit and symmetrical shape, with rich dark green leaves. Grows to medium height.

*Eugenia*

*E. malaccensis* is a handsome tree about 40 feet high, with large oval leaves. It bears crimson flowers in the hot weather. The round fruits are white, tinged with red.

**TREES**

*E. javanica* is a medium-sized tree, smaller than the above. In the rains it produces small, white, waxy fruits which are quite ornamental. Both the above appreciate a heavy rainfall.

*Ficus benjamina*, or Java Fig

A big, wide tree with an umbrella-like form, and smooth, shiny dark leaves. It is fairly quick-growing, and could be grown in a medium-sized garden.

*Litchi* and *Mango*

Both these are large fruit trees, and have handsome foliage affording dense, dark shade.

*Polyalthia longifolia*

A straight, medium-sized evergreen tree, with narrow wavy-edged leaves which are reddish when young and then turn dark green. Often used for avenues in large gardens or highways. It needs heading back at a height of 16 feet or so if it is to be grown in a medium-sized garden. Suited to moderately dry regions.

**Large trees with lighter foliage**

*Adenanthera*

*A. pavonina*, Bead Tree, or Red Sandalwood, is a quick-growing tree reaching a medium height. It has light foliage, but is usually grown for its bright scarlet seeds.

*A. bicolor* is smaller than the above and has a spreading form, the seeds being half red and half black.

*Azadirachta indica*, or Neem

A big evergreen tree with pretty foliage. Its dry-powdered leaves can be used as an insecticide. Only suitable for park-like gardens or wide avenues.

*Caesalpinia coriaria*, or Divi-divi

A spreading tree with light and pretty foliage. Bears sweet-scented flowers. This should not be grown on the main lawn as grass does not do well near it.

*Millingtonia hortensis*, or Indian Cork Tree

Very tall, and as it is somewhat brittle and has comparatively shallow roots, it is not recommended for a position near a

## THE GARDEN IN THE PLAINS

bungalow or for avenues. The foliage is pretty and light, and sweet-scented flowers appear in the cold weather. It is of quick growth and likes a dry situation. Only suitable for big gardens.

### *Pithecolobium saman* (*Inga saman*), or Rain Tree

So called because the leaves entrap the dew at night and release it like rain in the morning. It is a graceful, spreading tree and grows very rapidly. The foliage is fairly light and pretty with leaflets like flattened grapes. This tree can stand much buffeting by wind, and its rapid growth recommends it where shade is wanted quickly. Grows best in fairly moist districts. Can be grown from seed. Suitable for all but small gardens.

### Very big trees

The following four trees are often found on highways, but are too big for all but very large compounds.

### *Casuarina equisetifolia*, or Beefwood Tree

A large and quick-growing tree which is seen in many of the somewhat drier parts of India, but especially near the coasts. The slim branchlets moving in the wind bring to mind the murmuring of a lazy tropical sea on a sandy beach. This tree is not often deemed suitable for a modern garden on account of constant leaf fall.

### *Dalbergia sissoo*, or Shisham

A large tree, deciduous in January and in full foliage in the hot months. It is grown extensively for shade on the highways in upper India, and is sometimes seen in old compounds in the drier parts of India.

### *Ficus religiosa*, or Peepul

A big tree known all over India as being sacred to Hindus. The leaves are heart-shaped with elongated tips, and on windy days they turn on their stems with a peculiar clacking sound. The roots are very greedy, but it is a fine tree and keeps its leaf except for a brief period during the hot weather.

### *Tamarindus indica*, or Tamarind

A big spreading evergreen tree with small leaflets. The fruits are very sour and are used for sauces. It thrives in

## TREES

both moist and moderately dry districts, but is of slow growth. Often seen on highways, and occasionally in old gardens. A beautiful tree, but grass does not do well beneath it.

### A selection of trees for avenues

For medium-sized gardens: *Bauhinia*, *Kleinhovia hospita* and *Thespesia populnea*.

For large gardens: *Cassia siamea*, *Diospyros embryopteris*, *Filicium decipiens*, *Lagerstroemia flos reginae* and *L. thorelli*, *Peltophorum ferrugineum*, *Pithecolobium saman*, and *Polyalthia longifolia*.

### Unusual trees

### *Parmentiera cerifera*, or Candle Tree

A quaint tree of small growth, with rosy-white flowers that grow close to the branches, and candle-like yellow fruits that droop from the branches in the drier months.

### *Ravenala madagascariensis* (*Urania speciosa*), or Traveller's Tree

So called because the ends of the leaf stalks hold water, useful for a traveller in a thirsty land. Some observers have found this water to be sweet and pure, while others say that it is undrinkable. This is not a tree, strictly speaking, as the trunk or stem is thick and fleshy. The leaves resemble those of the banana and are apt to become tattered in the wind. They are arranged in the form of an open fan. This curious plant grows to a great height, and is only suitable for hot and humid districts. Propagated by division.

### Beautifying waste land

If you have any control over waste land outside the compound, it provides an opportunity for planting trees which are attractive in themselves, but are too large or unsuitable to be included in the garden itself. From the foregoing lists any of the larger flowering garden or colourful jungle trees, or if shade is wanted some of the big trees with dense foliage, are suitable. If the space at your disposal is large enough,

#### THE GARDEN IN THE PLAINS

plant the trees in clumps, remember that they will grow big, and allow at least 20 feet between each tree. Various Australian gums planted in groups give point to the landscape. Although they grow very tall they have comparatively little spread and can be planted from 15 to 18 feet apart. The Blue Gum (*Eucalyptus globulus*) is more often seen in the hills, but does well in some plains districts. The Lemon-scented Gum (*Eucalyptus citriodora*) is also seen on the plains occasionally.

The young trees should have some strong protection against cows or goats. Bamboo fences rot very quickly and are not really strong enough to stand up to a persistent cow. The best plan is to surround each tree with a fence of wire netting attached to strong stakes, with a ring of barbed wire along the top of the fence. On roadsides trees are often protected by means of mud and gravel walls with two or three drainage holes at the bottom near the ground, and topped by a few branches of some thorny shrub. Sometimes brick walls are used, loosely put together without mortar in an open, chequered pattern.

#### Chapter viii

### SHRUBS AND SHRUBBERIES

‘Group your hibiscus, oleander, or moonflower, and you will have, at the right season, a splash of colour that will redeem your whole garden from the commonplace.’

Kathleen L. Murray: *My Garden in the Wilderness*

Planting and transplanting—Shrubbery formation and group planting—Doctoring old shrubs—Pruning shrubs—Foliage shrubs—Flowering shrubs—(a) for the hot weather and rains—(b) for the cold weather—(c) that like semi-shade—(d) that thrive in poor soil—Other shrubbery plants for humid districts

WITH so many shrubs to choose from, it is difficult to cut down the selection so that it is representative without being too long. The shrubs mentioned here are all fairly common, although a few which deserve to be better known are suggested.

#### Planting and transplanting

Shrubs need the same consideration as trees when it comes to digging pits, careful planting and judicious watering. (See the section on ‘Planting trees’ in the chapter on ‘Trees’.) Each pit must be 3 feet deep and 3 feet in diameter, although a dwarf shrub can have a hole a little smaller.

The best time to plant shrubs is in the early rains. When taking over an old garden and perhaps transplanting shrubs, always see that there is a good ball of the original earth round their roots, and that the tap-root and main side-roots are not unduly cut or

#### THE GARDEN IN THE PLAINS

damaged when the plant is lifted. If the earth is loose, bind the ball lightly with a piece of hessian to prevent its falling to bits in transit, put the shrub on a wheelbarrow and move it to the new hole, which should be ready. Remove the hessian as the shrub is planted, and see that the tap-root is straight in the hole. Water carefully, unless there is heavy rain.

Given rainy weather, a well-dug pit and careful lifting, fairly big shrubs can sometimes be transplanted safely, but it is dangerous to move very old plants, for the shock is often too much for them. Occasionally a shift gives a new lease of life to a plant whose growth appears to be at a standstill; but transplanting big, old shrubs is usually a risky business of kill or cure.

Always give light shade to recently transplanted shrubs, and protection from wind if necessary, until the plants show signs of recovery. A healthy plant usually throws off its leaves cleanly after the shock of transplanting, and it is leaf which remains hanging limply that is a sign that a branch is dying or dead. Plants often die back slightly after transplanting, and when this happens cut back the tips of the branches to live wood. Naturally the hardier the shrub the better it can stand up to transplanting, and woody shrubs that are slow-growing usually take longer to recover than rapid growers.

#### *How close to plant*

It is difficult to say definitely how close shrubs should be planted because their spread varies so much. In shrubberies the plants may touch one another when full grown, and can usually be planted from 5 to 8 feet apart according to their size.

When grouped upon grass full-grown plants need from 5 to 15 feet between them if they are to be seen to their best advantage. This means they should be planted 10 or 15 feet apart, or even 20 to 25 feet in

#### SHRUBS AND SHRUBBERIES

the case of big, spreading shrubs like *Bauhinia galpini* or bougainvilleas. Such large shrubs are best confined to a single specimen unless the lawn is really big.

A rough guide for spacing is to take the maximum height likely to be attained by any given shrub, and plant it at that distance from its neighbours in the group. This is by no means an infallible rule, however, as some plants have a slender form whilst others have a wide spread in comparison to their height.

#### **Shrubbery formation and group planting**

Whether shrubs are to be grown in a shrubbery or grouped upon grass depends partly on personal taste and partly upon the space available and the general lie of the land. To my mind shrubs grown in groups on grass look more spontaneous than those massed tightly as a background, but there are many points in favour of a shrubbery.

#### *A shrubbery*

A well-placed shrubbery is very useful in giving the effect of either length or breadth to a garden. A wider selection of shrubs can be grown in a small garden if they are concentrated in a shrubbery, for planting in groups upon grass takes up a lot of room. Another point in favour of a shrubbery is that bushes which have some marked disability in the way of tall, lanky structure or deciduous nature, can be grown at the back. In this way they are inconspicuous during their ugly season, yet can be seen when in flower and beautiful. Small shrubs that are unsuited to pot work are best grown near the front of a shrubbery, for they are insignificant when placed singly and need a background of taller shrubs. If there is a lightly shaded corner in the garden it makes a good shrubbery for shade-loving plants. Most foliage shrubs like semi-shade and need massing to form an effective

## THE GARDEN IN THE PLAINS

background. A shrubbery makes a permanent border, where plants like the hardier lilies can be grown in clumps between the lower shrubs of the foreground.

Shrubs growing directly against green grass look far brighter than they do if there is a gravel path between them and a lawn. A shrubbery can be as wide as 12 to 20 feet, according to the space available, 15 feet being a good width in many gardens.

A straight-fronted shrubbery is not very impressive as a rule, and a gently curving line to include a few capes and bays, as it were, prevents a garden from looking stereotyped. The plants need to be grouped informally to be effective, avoiding straight lines. Speaking generally, tall shrubs should be grown towards the back of the shrubbery and low plants in the foreground. This rule ought not to be followed too rigidly, however, for one does not want the shrubbery to have an even, graded look. A few of the bushier tall shrubs planted rather forward make the planting seem spontaneous. Bear in mind the size the shrubs will be when full grown. Close planting avoids an empty look at first but a few shrubs will have to be removed later to give elbow-room for those that remain.

Before planting, the whole site for the shrubbery should be thoroughly dug, and a few baskets of rotted cattle manure or compost added to the pit for each shrub.

### Group planting

Big and particularly brilliant shrubs need isolation upon grass to be most effective, examples of which are *Bauhinia galpini*, the bougainvilleas, allamandas and other shrubby creepers pruned to bush form. Pale mauve or blue flowering shrubs are beautiful in a setting of soft green grass, whereas they are rather lost among massed bushes. Even plants often seen

## SHRUBS AND SHRUBBERIES

in shrubberies, such as ixoras, seem far more brilliant when grouped on grass.

It is effective to group several shrubs of one colour and kind together. True, this makes for a big dull patch when the plants are not in bloom, but that is more than compensated for by the bold mass of colour when they are flowering.

When growing shrubs on a lawn a definite sense of grouping is necessary, but they must not be grown too close together and, as mentioned before, grass should be visible round each individual shrub when it is full-grown.

### Doctoring old shrubs

In old gardens the shrubs sometimes look grey and thin, with leathery leaves and few flowers. Sickly shrubs growing on a lawn should have a wide circle of grass removed at their feet and the surface of the bare earth forked, while those in a shrubbery can be deep cultivated by means of a straight *kodali* fork with 12-inch prongs in line with the shaft. (See the chapter on 'Garden Implements'.) Deep cultivation means plunging the fork into the earth the length of the prongs and moving it gently backwards and forwards once, repeating the process in wide circles round the shrub. Be gentle, and do not damage severely any lateral roots by forking too close to the plant. Each shrub will benefit from the application of a couple of baskets of some bulk manure hand-forked into the soil at its foot at the beginning of the rains.

Moss and lichens on the branches can be rubbed off and the bark livened by washing it with lime water. A recipe for lime-water will be found in the section 'Fungus Sprays and Washes' in the chapter on 'Pests and Diseases': fungicides are listed in the same section, the spray 'Bordeaux mixture' being especially useful for shrubs which are afflicted with fungus disease.

## THE GARDEN IN THE PLAINS

All dead wood and blind, twiggy growth should be cut away. If thick branches are cut, put a dab of cowdung and mud paste on the wound. Do not prune live wood drastically until you are sure that the shrub is of a type that will benefit by cutting, and that it is the right time of year for this operation.

It may be necessary to remove a few plants in an overcrowded shrubbery so as to give those that remain room to develop.

### Pruning shrubs

Shrubs that are deciduous should be pruned about a month after leaf fall, some time in January being suitable in many cases. Evergreen shrubs that flower in the hot season and which benefit by pruning are also best cut back in January when their growth is at the minimum, although rampant shrubs like *Cestrum nocturnum* or *Argyrea campanulata* can be pruned whenever they get straggly or unmanageable. Shrubs that bloom in the cold weather should be pruned after they have finished flowering, and generally speaking January and February are good months.

Severe clipping of hedge plants makes the growth thick and dense, but, of course, flowering is reduced.

Woody shrubs, such as ixora or *Brunfelsia hopeana*, need little pruning except the cutting out of dead wood and general cleaning.

Details on pruning in special cases will be found in the paragraphs dealing with the various shrubs, and information on pruning in general in the chapter on this subject.

### Foliage shrubs

#### *Acalypha*

These shrubs are grown mainly for the beauty of their leaves. There are several types, perhaps the finest being those

## SHRUBS AND SHRUBBERIES

with deep red-bronze leaves which strike a deep note amongst other shrubs and also make effective demarcation hedges. Of these *A. wilkesiana* has bronze-green leaves blotched with crimson, *A. marginata* has dark bronze centres with lighter margins, and *A. macfeeana* has plain dark bronze-red leaves. The other colour combinations, green and cream and green and yellow, are usually grown in massed shrubberies. *A. illustrata* is one of the best of these, with yellowish-green leaves blotched with dark green. *A. obovata* is a fine green shrub. All can be grown from cuttings and will thrive both in full sun and in semi-shade.

#### *Aralia*

*A. filicifolia* and *A. balfourii* are good examples of these plants, and have green and cream ornamental foliage. Useful for a shady part of the shrubbery. Propagated by cuttings.

#### *Croton (Codiaeum)*

These shrubs have stiff, laurel-like leaves in many bright shades of red, yellow and green. Like many foliage shrubs they prefer semi-shade to full sun. There are a number of named varieties and descriptions of these can be obtained from a horticultural garden. Propagated by cuttings.

#### *Dracaena (Cordyline)*

There are some lovely colour combinations among the *Dracaenas*, green and cream leaves, soft yellow, salmon pink, bronze and red, and so on. Many varieties are dwarf and suitable for pot work or the foreground of a shady shrubbery, while others grow as tall as 4 to 6 feet. All the *Dracaenas* need semi-shade.

*D. sanderiana* is a variegated green and cream type growing about 1½ to 2 feet high, and is commonly seen. *D. goldieana* is green striped with yellow and grows about 5 feet high, while *D. godseffiana* has variegated leaves and grows 3 to 4 feet tall. *D. terminalis* is a tall type and is seen in red and coppery-green shades, and *D. victoriae* is a particularly handsome variety with cream leaves whose centre vein is green.

Propagated by stem or leaf cuttings, and by suckers.

#### *Eranthemum*

Many of the *Eranthemums* make fine foliage plants for a shady shrubbery, *E. elegans*, *E. eldorado*, *E. tricolor*,

## THE GARDEN IN THE PLAINS

*E. macrophylla variegata*, *E. albomarginata*, and *E. goldicii*, all being suitable. Propagated by cuttings.

### *Exaecaria bicolor*

A plant growing 5 or 6 feet high, with green leaves having deep crimson undersurfaces. Succeeds well in semi-shade. Propagated by cuttings.

### *Gynura*

*G. bicolor* is a hardy shrub growing about 5 feet tall. The leaves are oval and are covered with violet hairs which give them a velvety appearance. It thrives best in a shady part of the shrubbery.

*G. aurantiaca* resembles the above but only grows about 2 or 3 feet high.

Propagated by cuttings.

### *Panax*

These shrubs resemble the *Aralias*, and have pretty leaves of a refreshing green, or green and cream. *P. victorise* in particular makes a splash of pale colour in the shrubbery.

Propagated by cuttings.

### *Recinus*, or Castor Oil Plant

*R. gibsonii* has bronze leaves and is useful for filling in the back of a shrubbery.

*R. communis* has green leaves and red flowers. Neither of these plants is effective when grown alone.

Propagated by seed.

### *Strobilanthes*

Some of these plants make admirable small bushes for a shady shrubbery. *S. dyerianus* is a good specimen, and grows about 2 or 3 feet high. It has handsome crimson-purple and silvery-grey leaves. Propagated by cuttings.

## Flowering shrubs for the hot weather and rains

### *Allamanda*

Some of the allamandas are pure climbers, whereas others can be pruned and grown as shrubs. For descriptions of these shrubby climbers see the section on allamandas in the chapter on 'Climbers and Creepers'.

## SHRUBS AND SHRUBBERIES

### *Argyrea campanulata*

This shrub has pale mauve flowers rather like those of *convolvulus*, and looks its best on grass or in a setting of pale-green foliage shrubs. It has a semi-climbing habit and is apt to look straggly unless controlled by pruning. Sometimes seen growing over walls. Leaf beetles seem to find this shrub particularly tempting. Propagated by cuttings.

### *Bauhinia* (shrub types)

*B. acuminata* is a tall shrub that grows about 8 feet high. It is useful for the background of a shrubbery, and has white flowers that sparkle most of the year.

*B. galpini* is a South African variety introduced into India. The leaves are cloven like those of other *Bauhinias*, but are smaller and round. The flowers are bright red and seem to have alighted on the bush like butterflies. The shrub flowers in Assam, but never to the same extent as in drier Dehra Dun. It grows tall and spreads in proportion, looking its best when isolated on grass. The shrub flowers on and off throughout the hot months, and sometimes sheds many of its leaves after a vigorous flush of bloom.

### *Bougainvillea*

Bougainvilleas are primarily climbers, but they lend themselves to being pruned to shrub form. As large bushes they should be grown singly on a lawn away from other shrubs. See the chapter on 'Climbers and Creepers', under the sub-heading 'Bougainvilleas'.

*B. formosa* is like a straggly shrub in habit, and has light purple bracts which stay on the plant after they are dead, giving the bush a dusty, unsightly appearance. Usually grown as a shrub rather than as a climber.

### *Brunfelsia*

*B. americana* is a shrub growing 5 or 6 feet high, with white flowers which soon turn a pale primrose-yellow. Sweetly scented. Propagated by cuttings or seed.

*B. hopeana*, or franciscea as it is sometimes called, is an intriguing shrub with flowers that start off purple, change to mauve, and end up white. This habit has earned the plant its common name of 'Yesterday, today and tomorrow'. The flowers are scented and appear on and off throughout the year, but mainly in the spring. Of slow and shrubby growth. Clean the bush regularly but drastic pruning is

## THE GARDEN IN THE PLAINS

not advisable. Propagated by cuttings which are often slow to strike.

### *Buddleia*

*B. lindleyana* is a tall shrub with rather straggly habit, which bears mauve flowers useful for cutting. Seen commonly in the milder hill stations but will grow in the plains in some places.

*B. madagascariensis* is a shrubby climber of rampant growth. The leaves have pale, silky undersurfaces, and the orange flowers which appear in the spring are scented and rather insignificant.

Propagated by cuttings.

### *Caesalpinia pulcherrima* (*Poinciana pulcherrima*), Peacock Flower, or Barbados Pride

This shrub has attractive lacey foliage and can be had with flowers in two colours, either bright orange or a clear yellow. It is in bloom constantly throughout the hot weather and rains, but has the disadvantage of being bare of leaves in the cold months. Very easily increased from cuttings, and will stand heavy annual pruning in its dormant season or about a month after leaf fall.

### *Calliandra*

*C. haematocephala* is a small shrub growing 5 or 6 feet high with flower heads resembling little red powder puffs. Propagated by cuttings or seed.

*C. tweedii* has bright pink flowers, and is not often seen.

### *Capparis*

*C. horrida* is a straggling, thorny shrub useful for the drier districts where many of the best flowering shrubs cannot be grown. The numerous white flowers appear in the spring, and the young foliage is tinted a rich chestnut colour. Usually propagated by seed.

*C. zeylanica* much resembles the above, but the white flowers turn to cream and reddish-brown.

### *Cestrum nocturnum*, or Queen of the Night

This shrub blooms several times a year when it scents the garden in the evening. It has a straggly frame and grows about 12 feet high. It can stand drastic pruning at any time when necessary. Propagated by cuttings.

## SHRUBS AND SHRUBBERIES

### *Clerodendron* (shrub types)

*C. paniculatum* or Pagoda Flower, has conical red flower heads surmounting coarse dark leaves and erect stems. *C. haempferi* and *C. urticaefolium* resemble the Pagoda Flower closely, differing in the shade of red of the flowers and slightly in form. These shrubs are very hardy, will grow in most situations, and are usually self-sowing to an annoying extent. In the cold months they are often bare of leaves, but during the hot weather are very handsome when in bloom. They need massing to be effective, and can stand fairly drastic pruning. Height usually 5 or 6 feet.

In addition to the red types there are some forms with red and white flowers, such as *C. fragrans* which has scented flowers, and *C. inerme*; *C. volkameria* and *C. siphonanthus* have white flowers, and *C. macrosiphon* white flowers with protruding pink stamens. Propagated by cuttings, or by seed with some varieties.

### *Cuphea jorullensis* (*C. macrophylla*)

A small shrub growing about 3 feet high, with orange-yellow tubular flowers. Propagated by cuttings or division.

### *Daedalacanthus nervosus*

A dark-leaved shrub with deep powder-blue flowers appearing in the early spring. The shrub grows fairly large. Propagated by cuttings.

### *Duranta*

*D. plumieri* is often used as a hedge plant, but it is quite ornamental when grown singly. The sprays of mauve flowers are pretty if not particularly showy, and the dull gold berries which follow are useful for cutting. *D. plumieri variegata* has green and cream foliage, and *D. macrophylla* resembles *D. plumieri* in the colour of the flowers, but it has larger leaves and is altogether more showy when grown as a single specimen. *D. ellisiae* has white flowers. Propagated easily by cuttings.

### *Gardenia*

*G. florida* is an attractive gardenia with scented, creamy flowers like camellias. It grows 5 or 6 feet tall but is neat in form. Propagated by cuttings.

*G. fortunei* is very similar but smaller in growth.

*Hamelia patens*

A tall shrub with green foliage tipped with red and small orange tubular flowers that attract the curved beaks of sunbirds. Propagated by cuttings.

*Hibiscus*

There are many beautiful types of hibiscus within the *Rosa sinensis* species, or related to it. The red drooping-lily class is commonly seen, and there are single flowers, and others double like roses, in yellow, salmon, rose-pink and reds. The new varieties and hybrids are very fine and have expanded single flowers or double blooms in pale pink, yellow, terra-cotta, cerise and deep pink. All these have special names and can be procured from the Agri-Horticultural Gardens in Calcutta, and the other well-known horticultural gardens.

The showy hybrid varieties are sometimes grown as standards, the hybrid being budded or grafted onto a tall stem of the common red hibiscus. Cleft grafts are often used.

*H. schizopetalus* has drooping reddish flowers with fringed petals and although pretty, is not so showy as other hibiscus plants.

*H. syriacus* thrives well in the hills and in the cooler plains districts. The flowers are single white or mauve, with a dark crimson eye, and there are also double flowers in both these colours. The shrubs are of slender habit and the growth is thinner than with the majority of hibiscus plants.

*H. mutabilis* is sometimes known as the Changeable Rose, and flowers in the cold months. (See the section on 'Flowering Shrubs for the cold weather'.)

Most hibiscus plants flower best in the hot months, although a few blooms appear in the off-season. The bushes are apt to look rather thin in the cold months, but as soon as the weather begins to warm up leaf growth begins. The common red-flowered type does not shed its leaves to the same extent that some of the others do, and for this reason it makes an excellent demarcation hedge.

All hibiscus can be increased by cuttings, although the hybrids are often slow in striking. The finer varieties are sometimes budded on common varieties of vigorous growth. The hardy types stand pruning well and can be clipped severely when used as hedge plants, but the more delicate varieties are better left alone except for periodic cleaning.

*Ixora*

These shrubs flower right through the hot weather and rains, and are most desirable for any garden in a humid district. Being woody, rather slow-growing plants, regular cleaning is all that is necessary in the way of pruning.

The common red ixoras are slow-growing shrubs which eventually become quite tall. *I. coccinea* has densely packed heads of deep red flowers and fairly small dark green leaves. *I. stricta* has lighter red flowers and paler leaves, and is sometimes grown as a low hedge. Both are handsome shrubs and useful for providing cut flowers. There are some other types, however, which entirely eclipse these. They are not expensive, and can be obtained in orange tones, red, yellow and pink, a few examples being as follows.

*Orange*

*Prince of Orange*, with spectacular orange flowers. *I. singaporensis*, with huge terra-cotta heads. Both these have larger leaves and grow more quickly than the common red types mentioned above.

*Yellow*

*I. venusta* has beautiful butter-yellow flowers, but has small leaves and is of slow growth. It flowers when quite young, however, and the blooms are perfect for indoor decoration. *I. aurea* has pale yellow flowers.

*Sunset shades*

*I. javanica* has pinkish-apricot flowers, and *I. aurora* reddish-yellow flowers.

*Red*

*I. coccinea magnifica* has large leaves and brilliant red flowers. *I. macrothyrsa* is an effective reddish tone. These grow fairly quickly. *I. rosea* has pale pink flowers.

*White*

*I. alba* has white flowers and is slow growing. Propagated by cuttings.

*Jasmine*

*Jasminum angustifolium* has small fragrant white flowers, likewise the Arabian jasmine, *J. sambac*. These are good representatives of the many types of jasmine. Propagated by cuttings.

## THE GARDEN IN THE PLAINS

### *Jatropha panduræfolia*

This shrub has glossy dark leaves and cherry-red flowers. Not a showy plant at a distance, but on close inspection it is very pretty with its clear-cut flowers. Prune well in the cold weather as it is apt to become straggly. Height about 6 feet.

### *Kopsia fruticosa* (*Cerbera fruticosa*)

A hardy shrub with pretty pale pink flowers appearing throughout the year. Not a showy plant, but useful as it grows in almost any situation. Propagated by cuttings or seed.

### *Lantana*

The trouble with lantana is that it seeds down in such an annoying way. It is often seen rambling over waste ground, and in gardens this prolific habit is disastrous unless it is controlled by cutting off the flowers after they have withered slightly, but before the seed matures.

The tight little flower heads are very pretty, and with the hybridization that has taken place there are many lovely colours to choose from. *L. sellowiana*, with mauve verbenalike flowers, is a trailing variety useful for big stone vases or tubs. It is sometimes trained as a climber. Propagated by seed or cuttings.

### *Lagerstroemia indica*, or Crepe Myrtle

These shrubs are unsightly in the cold weather, being entirely denuded of leaves. When the warm days start the bare twigs become blurred with young green, and from April onwards the bushes are fairylike, being covered with sprays of crumpled pale mauve, white or deep pink flowers. The bushes grow about 6 to 9 feet tall and this, coupled with the fact of their deciduous nature, points to a place in the background. These shrubs should be cut back well in their dormant period in January or about a month after their leaves have fallen.

There is a very lovely variety called *L. lancasteri*, procurable from the Calcutta Agri-Horticultural Gardens. This has larger leaves, flowers and growth than the more common *indica* class, in fact it might almost be called a small tree. The flowers are a beautiful shade of Palma violet.

*The Bride*, also procurable from the Calcutta Agri-Horticultural Gardens, has flowers of a delicate pale pink.

## SHRUBS AND SHRUBBERIES

Largerstroemias look more lovely grouped together than dotted about singly. Propagated by cuttings or by seed.

### *Lawsonia alba*, Tree Mignonette, Henna, or Mehndi

The scented creamy flowers appearing towards the beginning and end of the hot weather make the shrub desirable; but it should be kept in the background as it has a lanky structure unless pruned to hedge form. Propagated by seed or by cuttings.

### *Magnolia*

*M. grandiflora* is a very big shrub or small tree, of slow growth and sometimes difficult to rear. The scented white flowers are magnificent, but appear rather sparingly. The leaves have tawny undersurfaces, and the general habit of the shrub is stately. Propagated by grafting as a rule.

There are several dwarf types, notably *M. fuscata*, *M. pumila* and *M. mutabilis*, with white or yellow flowers.

Propagated by cuttings.

### *Malpighia coccifera*

A dwarf shrub suitable for the front of a shrubbery. It can also be clipped as an edging plant or low hedge. It is of compact form, with dark foliage resembling miniature holly leaves, and small white flowers. A hardy little shrub that will thrive in most situations, but it is of rather slow growth. Propagated by cuttings.

### *Memecylon tinctorium*

A tall-growing, woody shrub with shiny leaves and pale blue-mauve flowers which cling close to the stem in neat clusters, faintly scented, appearing in March. Like most woody shrubs it is rather slow growing, and resembles the ixora, for instance, in flowering when quite small. Usually propagated by layers or by seed.

### *Mussaenda*

These shrubs have small red or orange flowers, but it is the curious enlarged sepal resembling a silvery white leaf which catches the attention, and the general effect is of a foliage plant with many pale leaves.

*M. corymbosa* is known as the Dhoby Plant or the Handkerchief Plant. It has small orange flowers and is commonly seen on waste lands.

*M. frondosa* also has pale sepals, but the flowers are larger

## THE GARDEN IN THE PLAINS

than the common Dhoby Plant and are reddish orange in colour.

*M. luteola* has butter-yellow flowers, and the white sepals are smaller than with the Dhoby Plant or *M. frondosa*.

*M. erythrophylla* is a more delicate type requiring a situation in semi-shade. The sepals are bright red instead of white, and the plant is of a semi-scandent nature. It can be pruned to shrub form.

Propagated by cuttings.

### *Ochna squarrosa*

A large shrub or small tree, with bright yellow flowers appearing in the hot weather, and followed by ornamental seed pods. Propagated by seed or cuttings.

### *Oleander (Nerium)*

The oleander is not so suitable for moist districts as it is for drier parts, where it blooms profusely. The flowers appear all the hot weather and rains, and can be single or double in pink, white or red. Of tall growth, it has the advantage of thriving in poor soil. This shrub does not like pruning. Propagated by cuttings, or by seed.

### *Orthosiphon stamineus*

This shrub is weird rather than beautiful, and has spidery greyish-lilac flowers borne most of the year. Its growth is rather sprawling and untidy, but it is a hardy plant and grows anywhere in the garden. Most useful for filling up odd corners and as a foil for more brilliant shrubs. Raised easily from seed, or by cuttings.

### *Plumbago*

*P. capensis* has flowers of a pretty pale blue appearing most of the year, but particularly during the warm months. It is a charming plant that grows in almost any situation, but needs good drainage. In habit it is a semi-climber, but it is usually grown as a shrub or else as a flowering hedge. It thickens rapidly so allow plenty of room if it is to be grown as a shrub. Other varieties bloom in the cool season. Propagated by cuttings or offsets.

### *Plumeria*, Temple Tree, or *Frangipani*

Strictly speaking, the Temple Tree or Pagoda Tree is *P. acutifolia*, a big shrub or small tree growing from 15 to 20 feet high, with creamy white flowers. The *Frangipani* is

## SHRUBS AND SHRUBBERIES

*P. rubra*, a tall shrub growing 12 to 16 feet high with red flowers.

All the plumerias have the great disadvantage of looking unsightly in the cold months when the ugly swollen stems are quite bare. They are useful, however, as they grow well in poor soil and the flowers are very fragrant. Of tall growth, they can be classed as large shrubs or small trees. There are many colours available, white flowers with yellow centres, yellow flowers, red flowers and pink and white flowers.

Propagated by cuttings.

### *Quassia amara*

A shrub growing 8 or 9 feet high with scarlet flowers which look rather like those of the flower *Salvia splendens*, appearing in the early hot season. The young foliage is tinged with red. Propagated by cuttings or by seed.

### *Russelia*

*R. juncea* or Mary's Tears, is a pretty plant growing 5 or 6 feet high, with grass-like stems and scarlet flowers resembling long coral beads or slender bells. It has a graceful weeping habit, and should be grown in a big tub or on some high spot like the top of a bank, so that the shower of red flowers can be fully appreciated. It thickens rapidly and is in bloom most of the year.

*R. floribunda* is stiffer in form and very beautiful when in bloom in the hot season. Height about 4 feet.

Propagated by cuttings or by division.

### *Strobilanthes*

There are many varieties, but the following are useful in many plains gardens, especially to fill in shrubberies. They are not showy enough to grow singly.

*S. scaber* is a small shrub which bears a profusion of small yellow flowers in March. The foliage is coarse and not very ornamental. *S. coloratus* grows 4 or 5 feet high, and has purple flowers.

Propagated by cuttings.

### *Tecoma* (shrub types)

*T. stans* is a tall shrub growing about 10 feet high, with fresh green foliage. The yellow bell-shaped flowers appear in clusters during the warm months, and a few odd bunches in the cool weather in mild places.

## THE GARDEN IN THE PLAINS

*T. mollis* is of rather smaller growth than *T. stans*, but the flower clusters are somewhat larger. *T. chrysantha* grows only 4 or 5 feet high, but has very pretty deeply serrated leaves.

These shrubs dislike excessive cold and are difficult to rear in those parts of India which have a severe winter. Propagated by cuttings or seed.

### *Thevetia neriifolia*

A big shrub with narrow leaves and yellow, bell-shaped flowers. Not showy but often seen in the prim gardens of railway stations. Propagated by cuttings.

### *Thunbergia* (shrub types)

*T. affinis* and *T. erecta* are dwarf shrubs growing about 4 feet high with deep blue bell-like flowers appearing in the hot weather and rains. Propagated by cuttings.

### *Woodfordia floribunda*

A jungle plant useful for a garden in the drier districts. In the spring numerous small tubular flowers of a brick-red colour appear along the weeping stems. Propagated by cuttings.

The following is a selection from the shrubs listed above which are more or less deciduous in the cold months. It must be remembered, however, that shrubs which shed their leaves in districts with a pronounced cold weather may not look so thin in places with next to no winter.

*Clerodendron paniculatum*, *C. kaempferi* and *C. urticaefolium*, *Caesalpinia pulcherrima* and *Lagerstroemia indica*.

*Hibiscus* and *Duranta* may look rather thin.

### Flowering shrubs for the cold weather

#### *Barleria*

*B. cristata* is often used as a low demarcation hedge, but can be grown as a bush. Blue flowers appear in the early cool weather, and there are also varieties with pink or white flowers, these last being less commonly seen. *B. cristata variegata*, with blue and white flowers, is attractive. Easily grown from cuttings.

## SHRUBS AND SHRUBBERIES

### *Cassia* (shrub types)

*C. alata* is a large spreading shrub with candle-like heads of yellow flowers. *C. didymobotrya* is a handsome shrub with dense, conical flower heads of bright gold. Easily grown from seed.

### *Clerodendron* (shrub types)

*C. nutans* is a tall shrub with drooping heads of greenish white flowers.

*C. ugandense* has pretty blue flowers appearing round about December, and grows 8 or 10 feet high. On occasion it is rather difficult to rear.

Propagated by cuttings.

### *Dombeya*

*D. angulata* is an ugly shrub when not in bloom as it is of rampant growth and has coarse foliage. When in bloom, however, it is very showy with bunches of pink flowers. Nip off the dead flower heads as they take a long time to drop off.

*D. gaggiana* has pink flowers, and *D. alba magnifica* white flowers.

Propagated by layers or cuttings.

### *Goldfussia*

These shrubs, are useful little plants as they flower in the cold weather and can be grown in pots, or in the foreground of a massed shrubbery in semi-shade.

*G. colorata* has red flowers, *G. glomerata* blue flowers with white tubes, and *G. anisophylla* has pale blue flowers.

Propagated by seed or cuttings.

### *Hamiltonia suaveolens*

An untidy shrub tall enough for the background of a shrubbery. Bears scented pale lavender flowers throughout the cool months. Cut back well after flowering. Propagated by cuttings at the end of the rains.

### *Hibiscus mutabilis*, or Changeable Rose

A tall shrub bearing large double or single flowers in the early cold weather, that change colour from white, through pale pink to deep pink. The leaves are coarse, and the shrub is not particularly ornamental when not in bloom. The flowers, however, are handsome and provide colour in the garden when it is badly needed. Prune after flowering.

Propagated by cuttings.

## THE GARDEN IN THE PLAINS

### *Jasminum pubescens*

A pretty jasmine with fragrant white flowers usually at their best in the cooler months. *J. rubescens* is a delightful pink-tinted form. Propagated by cuttings.

### *Montanoa bipinnatifida*

This is a rather lanky shrub suitable for a place in the background, and has coarse, much split leaves and sprays of white daisy-like flowers borne in January. Propagated by cuttings.

### *Plumbago*

*P. rosea* is a small shrub that has pretty rose-red flowers. *P. zeylanica* has white flowers and is useful for filling in, although it is not as ornamental as the blue *P. capensis* (mentioned previously in this chapter), or the pink *P. rosea*. Propagated by cuttings or offsets.

### *Poinsettia pulcherrima* (*Euphorbia pulcherrima*)

The flowers are small and yellow, the bright 'petals' that we see actually being bracts or bracteal leaves. These bracts can be narrow or broad, in bright red, soft pink or pale yellow. Poinsettias can stand heavy pruning and should not be allowed to get thin and overgrown, 9 to 10 feet being a good maximum height. When the bracts fade and the foliage looks sad round about February or March, cut back the branches well, and by the end of the rains they will have grown enough to need tipping when 5 or 6 inches of growth is cut back. Put a dab of mud and cowdung paste on the cut of each pruned branch. Sunlight suits these plants, and they are more striking massed than dotted about singly. Easily propagated by cuttings, and are quick growers.

### *Tithonia diversifolia*

A familiar shrub often called the Perennial Sunflower. The flowers are a cheerful bright yellow, but the bush is straggly in growth and should be kept in the background. Usually raised from seed, but strikes readily from cuttings.

## Flowering shrubs that like semi-shade

### *Acalypha sanderiana*

The flowers are like silky red tassels and appear constantly, the shrub growing fairly tall. Propagated by cuttings.

## SHRUBS AND SHRUBBERIES

### *Brugmansia suaveolens* (*Datura suaveolens*), Angel's Trumpet, or Trumpet Flower

A tall-growing shrub with scented, trumpet-shaped white flowers appearing in the hot weather and rains. It will grow in full sun, but does well in the semi-shade. Often spoken of as datura. Propagated by cuttings or seed.

### *Crossandra infundibuliformis*

Delightful small shrubs that have deep salmon pink, orange or butter-yellow flowers produced upon heads like wheat-ears all the hot months. Of dwarf growth, they make good pot plants. Propagated by cuttings or by seed.

### *Eranthemum*

These are small shrubs that bloom most of the year except in the cold months, and can be pot grown. There are white, red and blue flowering types, the blue being most commonly seen. Many eranthemum shrubs are grown mainly for the beauty of their foliage. Propagated by cuttings.

### *Goldfussia*

See 'Flowering shrubs for the cold weather'.

### *Olea fragrans*

A slow-growing shrub with dark green leaves and rather inconspicuous cream flowers appearing mainly in February and March. The scent from these flowers is delightful, penetrating but not in the least cloying. Propagation is often slow and difficult, layers or cuttings being the usual methods.

### *Pentas*

*P. carnea* is a pretty little shrub with heads of mauve flowers borne most of the year. There is a white variety, *P. alba*, and also a type with reddish-pink flowers. All are of dwarf growth suitable for growing in pots or for the foreground of a shrubbery.

*P. coccinea* has reddish flowers and grows taller than *P. carnea*, sometimes to a height of 6 or 8 feet.

Propagated by cuttings or seed.

## Flowering shrubs that thrive in poor soil

From the foregoing lists the following plants are hardy and will thrive in comparatively poor soil. The

## THE GARDEN IN THE PLAINS

common *Allamandas*, *Buddleias*, *Caesalpinia pulcherrima*, *Capparis*, *Clerodendron paniculatum*, *Hibiscus*, *Jasminum*, *Kopsia fruticosa*, *Lantana*, *Lagerstroemia indica*, *Memecylon tinctorium*, *Mussaenda*, *Oleander*, *Orthosiphon*, *Plumeria*, *Tecoma*, *Thevetia*, *Tithonia*.

### Other shrubby plants for humid districts

#### *Amomum magnificum*

A tall plant growing 8 to 12 feet high, with long green leaves and large pink flowers on erect stalks. Spreads rapidly to form a big clump, and needs severe control to keep it within bounds. A trench round the clump helps to prevent the roots from spreading. Needs semi-shade. Propagated by seed or by division.

#### *Calathea lindeniana*

A plant growing 2 to 3 feet high, with very handsome variegated leaves, dark and light green on the upper surface and purple and grey-green beneath. Needs light shade. Propagated by division.

#### *Heliconia*

These plants need light shade, and are easily propagated by suckers. They are handsome plants with large leaves.

*H. brasiliensis* is a tall plant, 5 to 8 feet high, with handsome red fruit spikes.

*H. insignis* has light bronze leaves and grows 6 to 9 feet high, while *H. metallica* has drooping bronze leaves with a metallic glint, growing 4 or 5 feet high.

*H. rubra-striata* grows 6 or 8 feet high and has massive green leaves edged and veined with red, the young leaves being reddish in tone. *H. aureo-striata* is somewhat smaller, having yellow horizontal markings.

#### *Musa coccinea*

A plant of the banana family growing 4 or 5 feet high, with long leaves and handsome red flowers. Propagated by suckers.

#### *Pitcairnia alta*

This plant, described among the tall succulents in a later chapter, makes a handsome addition to the shrubbery, and will thrive in semi-shade as well as in full sun.

## Chapter ix

# CLIMBERS AND CREEPERS

'The scent of honeysuckle floats  
Like music on the air.'

—Reginald Arkell

Supports for climbers—Care of climbers—Foliage climbers and creepers—Light flowering climbers for screens—Climbers for arches or pergolas—Heavy climbers for trees or strong pergolas—Flowering climbers that like semi-shade—Climbers trained as shrubs—Climbers that flower in the cold weather—Annual climbers—A climber for odd corners—Bougainvilleas—Ways of growing bougainvilleas

### Supports for climbers

THERE are several ways of showing off climbers. Some can be grown as screens, while others will twine round pillars, up trees, or along a pergola.

#### Screens

If a tall screen is required, posts made of old pipes or rails are, of course, preferable to wood. These can be painted green, and two feet of their length should be under the earth. The underground portions are best tarred and if possible bedded in concrete or packed both round and beneath with broken brick rubble. The spaces between the posts can be filled in with wire netting, one strip above the other, the edges being bound together with strands of soft galvanized wire. The top strip of wire mesh needs bracing to stand the weight of the climber, so several strands of galvanized wire should be threaded through the holes along the top edge and pulled taut to the posts. The

## THE GARDEN IN THE PLAINS

weight of the climber also tends to pull the posts together, and to counteract this the end posts should be guyed to the ground by means of strong wire pegged firmly to the earth.

Wire mesh is better than bamboo trellis-work as the latter rots quickly; but unfortunately metal becomes very hot in the sun and the young tendrils of the climber may be scorched before sufficient shade is formed as the foliage of the plant develops. A good start may be given to the young plant by letting it grow up a bamboo runner which is placed between it and the wire mesh. When a few leaves have grown the climber can be allowed to attach itself to the screen. Shading is also helpful at this stage.

### *Arches and pergolas*

Arches made of metal and wire mesh, and pergolas made of stone or brick, are useful for supporting either light or heavy climbers. The sections on 'Pergolas' and 'Arches' in the chapter on 'The Formal Garden and Garden Ornaments' give measurements and details as to materials and methods of construction.

### *Pillars and trees*

A pillar should have a tubular casing of wire mesh if it is to support a light climber with delicate tendrils.

A climber that is to grow up a tree will need staking at the foot of the trunk at first, and a certain amount of training. As the plant develops, it is a good plan to bind the long leader branch of the climber to the desired bough of the tree, using raffia or fibre for the purpose. Once the climber has got a grip on the tree both stakes and binding material can be removed. Do not train climbers up particularly attractive trees, as a vigorous climber is apt to hamper the growth of a tree.

## CLIMBERS AND CREEPERS

### **Care of climbers**

Every plant should have a heaped basket of manure forked into the earth round it yearly at the beginning of the rains, and the ground at the foot forked and kept clean of weeds for a distance of three feet.

Rampant climbers can stand drastic pruning once or even twice a year, but moderate growers and delicate types should only be cleaned by cutting out dead wood and twiggy growth.

Always see that a climber is securely fastened to its support, otherwise sudden strong winds can create great havoc.

### **Foliage climbers and creepers**

#### *Asparagus plumosus*

A feathery climber with finely divided leaflets, each spray or plume looking as if it had been pressed with an iron. Propagated by seed or division.

#### *Cissus discolor (Vitis discolor)*

A pretty creeper with mottled green and red leaves on red stems. It thrives in shade only, and is deciduous in the cold months. Propagated by cuttings.

#### *Ficus repens*, or Indian Ivy

This creeper has small dark green heart-shaped leaves. It will creep anywhere, over walls, up trees and even banks. It thickens rapidly and clings by many rootlets, a fact which makes it a useful plant for consolidating newly-formed banks or covering a large expanse of bare wall. It appears to like lime and for this reason, perhaps, does so well on walls. *F. stipulata* has larger leaves. Grown from cuttings.

#### *Philodendron carderi*

A creeper with heart-shaped dark green leaves with purple undersurfaces. There are several other varieties equally suitable for rambling over a rockery in the fernhouse. Propagated by layers or cuttings.

#### *Pothos*

*P. aureus* is a rampant climber usually grown up trees, with big leaves blotched with yellow. Given moist heat it

## THE GARDEN IN THE PLAINS

thrives so well that its stranglehold has earned it the name of 'Colombo Agent' (or 'Calcutta Agent', as the case may be) among planters in general.

*P. argenteus* has leaves marbled with silvery white. Propagated by cuttings.

### Light flowering climbers for screens

A screen should be entirely covered by its climber, but the tendency of a climber is to develop fan-wise from the root, leaving the lower corners of the screen bare of foliage. This defect can be overcome by training the early side branches horizontally, and by careful deflection of each shoot when it is long enough.

#### *Bignonia*

*B. gracilis* (sometimes known as *B. unguis-cati*) has yellow flowers which appear several times a year, but mainly in the early hot weather, the climber then being very lovely. Clings to its support by means of claw-like tendrils and is useful for covering stone walls. Propagated by seed or cuttings.

*B. incarnata* is a pretty climber with pale mauve flowers striped with a darker mauve, appearing in the early hot weather. Propagated by layers or cuttings.

*B. purpurea* is a pretty plant with purple flowers, slightly scented, appearing several times in a year, one flush showing in the cool months in some places. Rather difficult to establish, but well worth the trouble. It can be cleaned of dead wood from time to time, but does not like even light pruning. Propagated by layers or cuttings.

*B. venusta* is one mass of drooping orange flowers in January and February. There is an ugly stage when the leaves fall, but it is in foliage most of the year and is a glorious sight when flowering. It can be grown over a garage roof, up a tree, or along tall screens of wire mesh. As it is rather apt to 'mat' at the top of its support, train the side-shoots horizontally and the sprays to fall downwards, so that you will get a curtain of bloom. As soon as the flowers fall, cut out any dead wood and small interlacing branches. Propagated by layers or cuttings.

## CLIMBERS AND CREEPERS

### *Ipomoea palmata*, or Railway Creeper

This climber screens well, is very hardy, and has small mauve flowers. Propagated by seed or cuttings.

### *Jacquemontia violacea*

The foliage is light and pretty, and small blue flowers appear on and off most of the year. Not showy, but particularly suitable as a screen. Propagated by cuttings.

### *Passiflora*, or Passion Flower

*P. coerulea* is the type most commonly seen, with purplish-blue flowers.

*P. coccinea* has beautiful red flowers which appear rather sparingly.

Propagated by cuttings.

### *Poivreia coccinea*

This climber has glossy leaves and small, bright red flowers blooming all the hot months. Usually increased by layers.

### *Rhyncospermum jasminoides*

A useful climber as it will grow in semi-shade. The foliage is neat and attractive. Sparkling white, scented flowers appear profusely in the hot months. Propagated by cuttings or layers.

### *Thunbergia alata*, or Black-eyed Susan

A familiar climber with small white, yellow or orange flowers with a dark eye. It screens well. Easily grown from seed.

### Climbers for arches or pergolas

#### *Allamanda*

The large-flowered yellow allamandas (described in the section 'Climbers trained as shrubs') are spectacular when grown on arches or pergolas.

### *Antigonon*, or Sandwich Island Creeper

*A. leptopus* is the common rose pink variety, which is hardy and very pretty. If it is cut back to stems of about half an inch thickness in March it will flush as the rains break. Cut back rather more lightly at the end of the rains, it will flower just before Christmas in the milder districts.

## THE GARDEN IN THE PLAINS

*A. insigne* has larger flowers like miniature button roses, and is less vigorous in growth. *A. leptopus albiflora* has white flowers, *A. lancasteri* has white flushed pink flowers, and *A. apcari* deep red flowers.

Propagated by seed or cuttings.

### *Camoensia maxima*

A spectacular climber with big white flowers, the edges of the petals being fringed and of a pale gold colour. The flowers are scented and appear in sprays during the hot months. Inclined to be delicate until well established. Propagated by cuttings or seed.

### *Clerodendron* (climber types)

*C. thompsonae* has a white calyx and scarlet flowers. It is very light and pretty, but sheds its leaves in cold weather.

*C. splendens* has a scarlet calyx and flowers. Both these climbers grow very prettily on arches, but need a winter flowering annual climber grown on the other side of the same arch to hide the bare stems when they are leafless. Propagated by cuttings.

### *Ipomoea horsfalliae* var. *briggsi*

This climber has very pretty cherry red flowers appearing in the hot season and rains. The plant has tuberous roots, and its leaf growth is thin in cold weather. Propagated by cuttings.

### *Jasminum rex*

A truly lovely climber with waxy white flowers which appear in profusion in the hot months. They are not scented. Grows to perfection in the Peradeniya Gardens, Ceylon, and is well worth introducing into many parts of India. Propagated by cuttings.

### *Lonicera odoratissima*, or Honeysuckle

The flowers appear rather sparingly, but are delightfully scented. The foliage grows attractively and makes a neat and pretty covering for an arch. Propagated by cuttings.

### *Solanum*, or Potato Creeper

*S. seaforthianum*, the blue potato creeper, has attractive light foliage and pretty blue-mauve flowers which are followed by red berries.

## CLIMBERS AND CREEPERS

*S. jasminoides*, the white potato creeper, has similar flowers, only white in colour. This variety is more often seen in the hills but succeeds on the plains in some places.

*S. wenlandii* is a strong climber with coarse leaves and sprays of large blue-mauve flowers appearing in the hot months. Suitable for a pergola but will also grow up trees. A very showy plant.

All three propagated by cuttings.

### *Stephanotis floribunda*, or Creeping Tuberose

A handsome climber with scented, waxy white flowers borne in clusters during the hot weather and rains. Can be used to cover an arch if the situation is shaded from strong mid-day or afternoon sun. Often grown in a tub. Thorough drainage is essential. Propagated by cuttings.

### *Tecoma* (*Campsis*)

*T. grandiflora* has very beautiful terra-cotta flowers growing in clusters throughout the hot months. The foliage is light and pretty, but unfortunately the leaves fall in cold weather leaving the stem quite bare. It is a good plan to grow a winter flowering annual climber up the same support to mask the bare tecoma. Propagated by suckers.

*T. radicans* has deep reddish-orange flowers. This plant is a vigorous climber but the flowers appear rather sparingly. Propagated by cuttings.

*T. guilfoylei* is a cross between *grandiflora* and *radicans*, and is a good type to grow, being intermediate in colour and form. Propagated by cuttings.

*T. mackenzii* has pale pink flowers, produced in two flushes in the hot season. Likely to be thin in cold weather. Propagated by cuttings. A pretty climber seldom seen.

### *Thunbergia mysorensis*, or Munzerabad Creeper

This climber has yellow and red flowers borne in graceful pendant sprays. Blooms in the hot months, and is especially suited to a pergola. Propagated by layers, or by seed.

### *Tristellateia australis*, or Star Fruit Creeper

A climber with lovely pale yellow flowers which appear on and off throughout the year in many districts. Of fairly rampant growth, it is suitable for a pergola. Propagated by cuttings.

## THE GARDEN IN THE PLAINS

### Heavy climbers for trees or strong pergolas

#### *Allamanda aublettii*

This is a vigorous climber with bright yellow flowers which bloom freely. It races up trees. Propagated by cuttings.

#### *Banisteria laurifolia*, or Nepal Trumpet Creeper

A vigorous climber with dark green rigid leaves and bright yellow flowers. In bloom in the hot dry season. Propagated by cuttings.

#### *Beaumontia grandiflora*

A heavy climber with woody stems and large white, trumpet-shaped flowers which appear from January until March. Very handsome and a rapid grower. Propagated by cuttings.

#### *Bignonia magnifica*

This climber (described later in the chapter) is very suitable for growing along a pergola or up trees.

#### *Bougainvillea*

Bougainvilleas will be described later in this chapter. They are very effective trained along a pergola, and will grow up trees.

#### *Chonemorpha macrophylla*

A woody climber with big leaves and creamy-white flowers which have a rather curious scent. Well suited for growing up a tree or on a substantial support. Propagated by cuttings.

#### *Cryptostegia grandiflora*

A heavy climber or scandent shrub with mauve convolvulus-like flowers. Propagated by cuttings.

#### *Echites*

*E. caryophyllata* is a useful climber for growing up trees, and produces clove-scented white flowers from the end of June until September. Propagated by layers or by seed.

*E. rubro-venosa* has yellow flowers and ornamental leaves veined with pink. Propagated by cuttings.

#### *Odontadenia speciosa*

A showy climber suitable for a pergola, with scented salmon-yellow flowers. This plant is of South American

## CLIMBERS AND CREEPERS

origin, and does well in Peradeniya. It should succeed in some parts of India as well. Difficult to propagate, layering being the usual method.

#### *Pergularia odoratissima*, or Cowslip Creeper

This creeper is particularly suitable for growing up a tree somewhere in the background. The greenish-yellow flowers are not attractive enough to warrant a conspicuous place in the garden, but they are very fragrant. Blooms several times a year. Propagated by layers, or by seed which is borne in the cold weather.

#### *Quisqualis indica*, or Rangoon Creeper

This creeper bears scented pinky-red flowers in drooping bunches throughout the hot months. It is a strong climber and races up trees. It will stand severe pruning in January. Propagated by cuttings.

#### *Thunbergia grandiflora*

A rampant climber with wide open pale blue flowers and heavy leaves. If grown on a support it will need drastic pruning to keep it within bounds. Often grown up trees, on low roofs, or over high walls. There is a white variety resembling the above. Propagated by layers or cuttings.

### Flowering climbers that like semi-shade

#### *Clerodendron thompsonae* and *C. splendens*

Both of these have been described already in this chapter, and grow in semi-shade as well as in full sun.

#### *Manettia bicolor*

A light climber with scarlet and yellow tubular flowers appearing in the rains. Propagated by cuttings or division.

#### *Rhyncospermum jasminoides*

This climber, already described in a previous section, will grow in semi-shade as well as sun. Propagated by layers or cuttings.

#### *Thunbergia fragrans*

A climber with white flowers that are not scented, despite its name. Easily propagated by seed.

## THE GARDEN IN THE PLAINS

### Climbers trained as shrubs

#### *Allamanda*

Allamandas grow quickly and are therefore particularly useful in a new garden. They are neat in form, for the most part, so are suited to small compounds.

*A. violacea* is not so much a climber as a small shrub with wine-mauve flowers. They are not particularly showy and the bush is apt to look insignificant in a massed shrubbery, but on grass or against pale greenery the flowers look cool and pretty.

*A. schottii*, *A. hendersoni* and *A. grandiflora* all resemble each other with a few minor differences, and have large, expanded yellow flowers and glossy leaves.

The large-flowered allamandas look well if grown singly as shrubs stiffened by careful pruning. In a corner of a big lawn an 'island' of yellow allamandas looks magnificent. Grow five or six plants in one large round bed, one in the centre and the others round it, leaving at least 4 feet clear between each plant. Prune the plants until they are shrubby, and gradually allow them to gain the desired height, the centre shrub higher than those around it. Eventually they will thicken and form one solid mass of bloom, rising in the centre. Once the bushes have thickened, allow the sprays to grow and fall naturally to the ground in a shower, tipping them when they become too long. Any subsequent pruning should be done when the plants are dormant in the cold weather. Manure well once a year just before the rains.

Allamandas look effective trailing along low railings. Grown thus they should not be so heavily pruned as when a bushy form is required. The side-shoots must not be allowed to sprawl on the ground, but the leader should gain length to grow along the railing. These climbers look attractive over arches or on pergolas.

Easily propagated by cuttings.

#### *Bignonia magnifica*

This is a vigorous climber that can be stiffened by pruning to make a large shrub. The flowers are magenta tinted mauve, blooming freely. It is a very showy plant and looks fine isolated on grass; but allow plenty of room as it thickens rapidly and grows big. Also spectacular grown as a climber on a strong pergola. Propagated by cuttings.

## CLIMBERS AND CREEPERS

#### *Clerodendron speciosum*

This is a shrubby climber which bears ruby-red flowers in the hot months. Propagated by cuttings.

#### *Petrea volubilis*

This climber has lovely deep blue-mauve flowers appearing in the early hot months and autumn, and rough, coarse leaves. It can be pruned to shrub form, or if supported at intervals by large nails it can be trained up a wall or on a screen, when it looks very like wistaria. It also looks well on a pergola. Propagated by layers or by suckers.

#### *Roupellia grata*, or Cream-fruit Plant

A shrubby climber usually pruned to shrub form. When wounded it yields a cream-like juice. The leaves are thick with a polished surface, and about 4 inches in length. The flowers are borne in dense bunches, and are white tinged with dark crimson. The plant is of rampant growth and needs plenty of room unless controlled severely. It looks very handsome in a suitable setting, but should not be chosen for the small garden where there is space for only a few plants. Propagated by cuttings or seed.

### Climbers that flower in the cold weather

#### *Combretums*

These climbers resemble *Poinciana coccinea*, and several varieties flower in the cold season. Cuttings are taken from young shoots.

#### *Congea tomentosa*

This climber has lovely mauve bracts resembling petals, and is very showy from December to February when colour is much appreciated in the garden. It can be grown on a strong pergola, or may be stiffened by pruning into shrub form. There is a white variety, *C. alba*. Propagated by cuttings.

#### *Holmskioldia*

A woody climber usually grown as a shrub. From October to December it bears rust-red flowers like tiny candlesticks. There is also a second variety with paler orange-yellow flowers. This climber should be cut back well after flowering as it soon becomes straggly and untidy if not controlled.

## THE GARDEN IN THE PLAINS

Shade makes its growth thin and attenuated. Propagated by cuttings or from seed.

### *Porana*

*P. paniculata*, the Bridal Creeper, is a lovely plant with greyish-green heart-shaped leaves and masses of pure white scented flowers appearing in November-December. It should be pruned drastically after flowering. A very useful plant for providing beautiful cut flowers in the empty period before annual flowers come into bloom.

*P. volubilis* is a vigorous climber with greenish-white flowers appearing in November.

Propagated by cuttings.

### Annual climbers

These are useful for mingling with hot-weather flowering climbers which are leafless in the cold months. The seeds of most annual creepers should be sown in July-August.

### *Clitoria ternatea*, or Mussel-shell Creeper

This has blue or white flowers. It is easily raised from seed sown in the rains. Blooms on and off throughout the year.

### *Cobaea scandens*

This is an ornamental climber with greenish-white or greenish-purple flowers like bells. It is often seen in hill stations, but will grow in some plains districts. The seed is usually sown in late August or early September. On occasion the plant will not bloom until the cold weather a year later, and will need much cossetting during the hot months. Grow the plant in a sheltered position.

### *Ipomoea*

*I. coccinea* has small red flowers. *I. purpurea*, or convolvulus major, has reddish-purple flowers. *I. rubro-coerulea*, the heavenly-blue morning glory, has wide open blue flowers with white hearts, which only last a few hours. *I. quamoclit* has red flowers and much-split green foliage, and is of slender growth. *I. hederacea*, the Japanese morning glory, with lovely blue flowers, can be sown at any time of the year.

## CLIMBERS AND CREEPERS

### *Maurandya barclayana*

A creeping plant with purple or pinkish flowers. Sow the seeds in August in a sheltered position.

### *Mina lobata* (*Ipomoea versicolor*)

A pretty light climber with orange and red blooms in upright sprays. Sow in July if it is to flower in the cold weather.

### A climber for odd corners

### *Gloriosa superba*, or Lobster Claw Creeper

This is a jungle plant useful for filling in odd corners in a garden. It is a slender twiner which is dormant and dies down in the cold weather, and in the rains bears spectacular claw-shaped yellow and scarlet flowers. It can be placed in the permanent border given some support, or used to brighten any dull corner of the garden. Propagated by division of the tubers. *G. rothschildiana* is a magnificent cultivated variety.

### Bougainvilleas

Few plants are more gorgeous than a bougainvillea in full bloom. The flowers of the bougainvillea are very small and insignificant, the coloured bracts round the flowers making the beauty of the plant. Bougainvilleas flower a great part of the dry season, and are invaluable in providing broad colour effects in the garden.

### How to plant bougainvilleas

Bougainvilleas need full sun and thorough drainage if they are to flourish. Each plant should have a pit dug for it, say 3 feet in diameter and 3 feet deep. Refill the pit with its own soil adding 5 or 6 baskets of old cattle manure or compost. If necessary add a little extra soil so as to raise the level of the bed by a few inches to allow for the sinking of the loose earth, and to make a 'stage' for the plant. Yearly top dressings of manure, and clean weeding immediately round the plant, is all that it should require in the way of after-treatment.

## THE GARDEN IN THE PLAINS

Most of the strong growers among bougainvilleas are fairly easily increased by cuttings. If the cuttings do not strike, try making layers. (See the chapter on 'Plant Propagation' under the heading 'Propagation by layers'.)

### Varieties of bougainvillea

*B. glabra* spreads well, and flowers constantly. It has spines, its leaves are smooth, and its bracts are coloured a magenta purple. Varieties derived from this species are *B. glabra* var. *cypheri*, which has very deep green leaves and intense purple bracts, and *B. glabra* var. *sanderiana* which is of compact growth and has small leaves and bracts but is very free flowering, although the blooming period is rather short.

*B. spectabilis* has larger leaves than *B. glabra* and they are rather hairy, the spines being longer and more numerous. A variety derived from this species is the rust-red *B. spectabilis* var. *lateritia*, which blooms best in dry weather.

Some of the crosses are very beautiful. Var. *Mrs Butt* (*Scarlet Queen*) blooms profusely several times a year, and is of vigorous growth. The bracts are a lovely deep crimson which varies slightly in tone, but does not clash with other colours. Var. *Mrs Louis Wathen* is a particularly fine plant with tawny apricot bracts shaded with mauve. It is robust and flowers freely. Var. *The Maharaja of Mysore* is said to be the hybrid of *B. glabra* and *B. spectabilis* var. *lateritia*. It has rust-red bracts shaded with purple and flowers freely in the dry weather. *B. magnifica trailii* has enormous purple bracts and has a more trailing habit than most other varieties. Var. *Mrs Fraser* has lovely rust-red bracts, but is sometimes rather shy of flowering. *Lord Willingdon* is an attractive red shade, and *Mrs Lancaster* is a pinkish-mauve. *B. rosa catalina* has fine pink bracts, but is difficult to propagate. There are many others, but this is a fairly representative selection.

### Ways of growing bougainvilleas

#### Up trees and round tanks

Most of the magenta bougainvilleas are apt to kill other colours when planted in a small garden. They

## CLIMBERS AND CREEPERS

look very fine against a background of green, however, so are particularly suitable for climbing any large trees found growing on the borders of the compound. The rather hard colour is softened when reflected in water, and few sights are more beautiful than these bougainvilleas grown on the banks of a 'tank'. (See the chapter on 'Water Gardens and Marshy Ground'.)

#### On pergolas and strong supports

*Mrs Butt* or *Mrs Louis Wathen* look particularly beautiful when grown on a substantial pergola. As the climber develops, a few of the lower side-shoots should be removed so that the main show of bloom lies along the top supports of the pergola. Bougainvilleas look striking climbing up pillars and along the roofs of high porches.

#### Up posts and along wires

A light and spectacular effect can be brought about by growing bougainvilleas up metal posts which are joined together by a series of strong single wires stretched taut and spaced about 18 inches or 2 feet apart. Selected shoots of each bougainvillea are trained along every wire, and the rest of the plant kept under control. Careful pruning is necessary to achieve the desired effect. This way of growing the climber makes a decorative screen which is very brilliant but not at all solid.

#### Over garage roofs and outhouses

Any of the vigorous bougainvilleas will cover a garage roof quickly. If the roof has been painted a vivid red, it might be better to pass over the strong magenta shades in favour of the crimson or apricot colours.

#### Grown as a large shrub isolated on grass

Grown as shrubs or 'islands' on grass, bougainvilleas are exceedingly decorative, and perhaps this is

## THE GARDEN IN THE PLAINS

the most spectacular way of growing them. On a very large lawn a group of specimen bougainvilleas in the red or terra-cotta shades makes a blaze of colour, but it needs a lot of room. On a medium-sized lawn one well-grown plant is enough.

One method of achieving the desired form is to make a support consisting of three old rails or pipes placed in a triangle round the plant, each post 3 feet from the others, 18 inches of their length being under the earth and about  $4\frac{1}{2}$  feet above ground. Paint these posts green, and then thread three or four strands of thick galvanized wire round them, allowing sufficient room between the wires to accommodate the side sprays of the plant. Twist several strands of the wire together to form a strong top brace, and let the 'leader' shoot of the creeper push up through the centre of the triangle. The support will soon be hidden and helps to give form to the bush, but if necessary it can be removed when the 'spine' of the creeper has strengthened.

Another method is to make the creeper form its own support. This is done by pruning the strong shoots, and binding the pliable stems round and down, either to the strong, upright shoots, or to a few stout stakes driven into the ground.

Judicious pruning helps to make a good frame and controls too rampant growth, but when the plant is big it should not be so severe as to destroy the effect of the flowering sprays cascading to the ground.

### *Rambling down banks*

Unsupported bougainvilleas, left to develop in their own way, look spectacular rambling down a grassy slope or falling over the lip of a low cliff or retaining wall.

## CLIMBERS AND CREEPERS

### *Bougainvilleas as standards*

Bright colour can be introduced into the formal garden by growing bougainvilleas as standards. Mr's Butt or Mrs Louis Wathen make gay miniature trees planted on either side of a paved path, or they can be grown in tubs at the entrance to the flower garden. A compact type like *B. glabra* var. *sanderiana* is particularly suited to growth in tubs, and a variety which is sometimes rather shy of blooming, Mrs Fraser for instance, may benefit from the root restriction brought about by the confined space in a tub. Lord Willingdon is also suitable. Standards need careful pruning and much attention.

### *Bougainvilleas as hedges*

In Mysore the bougainvillea hedges are very striking. They are substantial and are kept neatly clipped. In spite of constant pruning the flowers appear and the bracts powder the surface of the hedge with colour, especially on the sunny side. *B. glabra* and *B. spectabilis* are the types commonly used for hedges.

Chapter x

PALMS, ORNAMENTAL GRASSES  
AND A FEW SUCCULENTS

'Trees going up like the masts of ships.'

—R. L. Stevenson

PALMS—Tall palms—Small palms—Palms in pots—Palms and allied plants that like moisture—Cycas—ORNAMENTAL GRASSES—Bamboos—Tall grasses—Small grasses—A FEW SUCCULENT PLANTS—Tall succulents—Smaller succulents—Succulents for pot work.

IF the compound is big enough and the climate suitable, it is pleasant to introduce a touch of the wild or exotic into the garden by growing a clump or two of tall grasses, or perhaps a group of plants.

PALMS

The most beautiful palms are indigenous to the wet tropical parts of the world, although some types, date and palmyra palms for instance, thrive and fruit in dry places. Tropical palms are best potted in a fernery unless the climate allows of their being raised out of doors.

In districts where the climate is suitable for their culture, tall palms look most attractive in a large compound, set by a gateway or grouped together at some point requiring emphasis. In smaller gardens tall palms are too overpowering to be suitable, although one or two of the comparatively small types might be grown. It must be borne in mind, however,

PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS that palms left to grow naturally outdoors are seldom dwarf in form eventually.

Many palms that grow tall in the garden can be dwarfed by growing them in pots. These pot-grown palms are most useful for decorating a veranda or for a fern house, and will give a much quicker return than palms left to grow to their full height outdoors.

Palms are hardy and do not require much attention except the cutting off of dead leaves and flower spikes as they appear. Occasionally the leaves are eaten by beetles, but as a rule gardeners have no difficulty in growing palms. Soil should be light and sandy, but fairly rich.

Palms are divided into two main groups, 'feather-leaved' or pinnate, or 'fan-leaved'. Here follow suggestions for suitable palms to grow.

Tall palms

The following are suitable for avenues in very big gardens.

Feather-leaved

*Arenga saccharifera*, Sugar Palm, 25 feet  
*Bentinckia condapanna*, 30 feet, slender  
*Caryota urens*, Toddy Palm, 45 feet  
*Cocos flexuosa*, 30 to 40 feet. *C. weddelliana* is smaller  
*Elaeis guineensis*, Oil Palm  
*Jubaea spectabilis*, very handsome  
*Kentia macarthurii*, *K. belmoreana*, both these *Kentia* are most beautiful when young and about 10 feet high  
*Oreodoxa regia*, *O. oleracea*, Cabbage Palm, 80 feet  
*Seaforthia elegans* (*Archontophoenix cunninghamii*) 40 feet

Fan-leaved

*Borassus flabellifer*, Palmyra Palm  
*Corypha umbraculifera*, Talipot Palm  
*Latania commersonii*, 20 feet, bronze-green leaves

#### THE GARDEN IN THE PLAINS

*Stevensonia grandifolia*, 40 feet, leaves reddish

*Thrinax argentea*, 20 to 30 feet

#### Small palms

The following are suitable for medium-sized gardens.

#### Feather-leaved

*Chrysalidocarpus lutescens*, a bushy type

*Phoenix rupicola*

*Pinanga spectabilis*

*Ptychosperma macarthurii*, small and bushy

#### Fan-leaved

*Chamaerops humilis*, a sub-tropical dwarf species

*Licuala gracilis*, *L. elegans*, *L. grandis*, all small types

*Rhapis flabelliformis*, bushy sub-tropical species

*Sabal adansonii*, a sub-tropical species

#### Palms in pots

Palms in pots need a fairly light soil, a good compost being given below.

#### Compost for potted palms

1 part leaf mould

1 part clean fine sand

2 parts ordinary garden soil

A six months old palm can be potted in a 6-inch pot, being progressively re-potted when necessary to larger pots, the maximum size being a 14-inch pot, or, if there is plenty of space for the height of the palm, an 18-inch tub.

Palms need re-potting perhaps once a year, or when the roots fill the pots. It is important not to disturb the roots when lifting the plant, and do not straighten the roots when re-potting.

If the plants do not need re-potting one year, remove about 1½ inches of the top-soil in the pot instead, and top-dress with a compost as follows.

#### PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS

#### Top-dressing for potted palms

1 part old cattle manure

1 part leaf mould

1 part sand

Potted palms can be taken up and planted out in the ground provided they are not too old and stunted.

Most palms can be pot grown for a time, but the following are especially suited for the purpose.

#### Feather-leaved

*Chrysalidocarpus lutescens*

*Kentia belmoreana*

*Phoenix roebelinii*

*Ptychosperma macarthurii*

#### Fan-leaved

*Licuala gracilis*, *L. elegans*, *L. grandis*

#### Palms and allied plants that like moisture

The following can be grown on marshy ground, and are useful for ornamenting a low-lying area near a pond.

#### Palms

*Euterpe edulis*

*Nipa fruticans*

*Rhapis flabelliformis*

#### Allied plants

*Carludovica palmata*

*Cyclanthus cristatus*

*Pandanus odoratissimus* (Screw pine). *P. veitchii*,

*P. utilis*, *P. sanderiana* are decorative dwarf types.

#### Cycas

These plants much resemble palms in appearance, and look well on a big lawn. Being of small growth they are more suitable than palms for the average garden.

*Cycas circinalis*, height 10 to 14 feet

*C. revoluta*, a dwarf species about 6 feet high

## THE GARDEN IN THE PLAINS

- C. rumphii*, 6 to 8 feet high  
*C. siamensis*, 5 to 6 feet high

## ORNAMENTAL GRASSES

### Bamboos

Bamboos for the most part like a fairly moist climate. Some grow at a height of 3,000 feet above sea-level, but the very large varieties belong to low damp country.

A clump of bamboos should be kept clean, and when cutting out old stumps be sure to do so at the node, for if you cut between nodes the hollow stems will form a receptacle for water, and a breeding place for mosquitoes.

Bamboos flower after a very long period, may be up to fifty years or more, after which the parent clump dies. It takes a long time for a clump to form. The first year the suckers usually give rise to two stems, often thin, solid and twisted. Subsequent stems are normal, and double in numbers each year.

Bamboos are best propagated in rainy weather by suckers, several feet long, taken with a piece of root. Dig the ground well before planting. The sucker should be put into the soil at a slant, and the cut top protected with a dab of mud and cowdung paste.

### *Bambusa arundinacea*

The ordinary green and prickly bamboo.

### *B. aurea*, or Golden Bamboo

A smaller type suited to medium-sized gardens in comparatively cool districts. It is very ornamental and has yellow stems.

### *B. nana*

A dwarf species growing about 8 feet high. It makes an excellent hedge for a wind break.

[ 176 ]

## PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS

### *B. nigra*

This bamboo grows about 25 feet high, the young stems being a dark purple colour. It is suited to comparatively cool districts.

### *B. siamensis*

A very graceful bamboo with feathery plumes, growing about 30 feet high.

### *B. vulgaris*

A tall variety about 40 feet high with greenish-yellow stems. It likes moisture and thrives on river banks.

### Tall grasses

Clumps of these grasses are attractive in a large garden, or near a tank treated in the landscape manner. Soil should be light. Re-plant when the clumps thicken unduly. Propagation by division or seed.

### *Arundo donax variegata*

A pretty variegated grass growing 6 to 8 feet high. It likes full sun and a light, sandy soil. Thin out in the rains if the clump thickens.

### *Gynerium argenteum*, or Pampas Grass

A very ornamental grass growing about 8 feet high, with silvery white plumes. Grows well in the cooler districts.

### *Saccharum arundinaceum*, or Elephant Grass

A tall coarse grass with white plumes.

### *Thysanolaena agrostis*

A grass growing about 10 feet high, with solid stems and purplish-brown plumes.

### Small grasses

### *Apluda aristata*

A small grass about 1 to 1½ feet high which looks like a miniature bamboo, and is suitable for a cleft in a rockery or for pot work.

### *Briza maxima*, or Quaking Grass

A grass with pretty little heart-shaped flowering heads.

[ 177 ]

## THE GARDEN IN THE PLAINS

- C. rumphii*, 6 to 8 feet high  
*C. siamensis*, 5 to 6 feet high

## ORNAMENTAL GRASSES

### Bamboos

Bamboos for the most part like a fairly moist climate. Some grow at a height of 3,000 feet above sea-level, but the very large varieties belong to low, damp country.

A clump of bamboos should be kept clean, and when cutting out old stumps be sure to do so at the node, for if you cut between nodes the hollow stems will form a receptacle for water, and a breeding place for mosquitoes.

Bamboos flower after a very long period, may be up to fifty years or more, after which the parent clump dies. It takes a long time for a clump to form. The first year the suckers usually give rise to two stems, often thin, solid and twisted. Subsequent stems are normal, and double in numbers each year.

Bamboos are best propagated in rainy weather by suckers, several feet long, taken with a piece of root. Dig the ground well before planting. The sucker should be put into the soil at a slant, and the cut top protected with a dab of mud and cowdung paste.

#### *Bambusa arundinacea*

The ordinary green and prickly bamboo.

#### *B. aurea*, or Golden Bamboo

A smaller type suited to medium-sized gardens in comparatively cool districts. It is very ornamental and has yellow stems.

#### *B. nana*

A dwarf species growing about 8 feet high. It makes an excellent hedge for a wind break.

[ 176 ]

## PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS

### *B. nigra*

This bamboo grows about 25 feet high, the young stems being a dark purple colour. It is suited to comparatively cool districts.

### *B. siamensis*

A very graceful bamboo with feathery plumes, growing about 30 feet high.

### *B. vulgaris*

A tall variety about 40 feet high with greenish-yellow stems. It likes moisture and thrives on river banks.

### Tall grasses

Clumps of these grasses are attractive in a large garden, or near a tank treated in the landscape manner. Soil should be light. Re-plant when the clumps thicken unduly. Propagation by division or seed.

#### *Arundo donax variegata*

A pretty variegated grass growing 6 to 8 feet high. It likes full sun and a light, sandy soil. Thin out in the rains if the clump thickens.

#### *Gynierium argenteum*, or Pampas Grass

A very ornamental grass growing about 8 feet high, with silvery white plumes. Grows well in the cooler districts.

#### *Saccharum arundinaceum*, or Elephant Grass

A tall coarse grass with white plumes.

#### *Thysanolaena agrostis*

A grass growing about 10 feet high, with solid stems and purplish-brown plumes.

### Small grasses

#### *Apluda aristata*

A small grass about 1 to 1½ feet high which looks like a miniature bamboo, and is suitable for a cleft in a rockery or for pot work.

#### *Briza maxima*, or Quaking Grass

A grass with pretty little heart-shaped flowering heads.

[ 177 ]

#### THE GARDEN IN THE PLAINS

Suitable for the cooler districts. Sow seeds in October. Mainly grown in the wilder parts of the garden.

*Phalaris arundinacea*, Gardener's Garter or Ribbon Grass

A small variegated grass suitable for edgings. Spreads rapidly.

*Stipa pennata*, or Feather Grass

A pretty grass with feather-like white flowering heads, growing about 2 feet high. Commonly seen in the gardens of Europe. Sometimes grown on the Indian hills, but can also be raised in the cooler months in some plains districts. Sow seed early in October or late September.

*Tricholaena rosea*, or Red-topped Grass

A light grass 1½ to 2 feet high. The flowering heads look the prettiest pink, especially in the late afternoon light. Can be grown annually from seed in the cooler months in many districts.

#### A FEW SUCCULENT PLANTS

Most succulent plants of, or resembling, the cactus type prefer dry localities, although a few thrive in fairly moist districts. The soil for these plants should be light and porous, with good drainage, and fairly rich.

Plants of the cactus tribe are usually propagated easily by placing a joint in sand where, reasonably watered, it will strike and form a new plant. Some varieties are grafted by nurserymen.

These curious plants are grotesque and rather ugly in themselves, although many of them have ornamental flowers, but their strangeness adds interest to a garden and room should be made for one or two of the tall class in a big compound. They are particularly useful in dry districts where the choice of other plants is limited. Smaller succulents grown in pots fit in well with modern schemes of interior house decoration.

#### PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS

##### Tall succulents

*Agave americana variegata*, or Century Plant

A stemless plant with large variegated leaves with spiny edges. Propagated by suckers. Not found in moist districts.

*Aloe abyssinica*

One of the bigger aloes with small red flowers.

*Cereus peruvianus*, or Giant Cactus

A weird plant from South America which grows as tall as 30 feet or more, and has white flowers appearing at night. This will thrive in a fairly moist district, but is not likely to be found in an ordinary garden. There is no reason why it should not be planted in a really large compound.

Others of the species are climbing plants, but all flower at night. The best known of this type is *Cereus grandiflorus*, or night-flowering cereus. This is a rampant climber and bears big, fragrant white flowers which appear just before the dawn.

*Nopalea coccinellifera*, or Spineless Cactus

A leafless shrub 7 or 8 feet high, with flat pear-shaped segments or 'tubercles'. Flowers red.

*Opuntia dillenii*, or Prickly Pear

Resembles the above but has spines on the segments, which are more rounded. Flourishes in dry districts in rocky ground. This plant takes charge if it finds conditions favourable and can become a most difficult weed. *O. elatior* has lemon flowers changing to pink.

*Pitcairnia alta*

A plant with leaves rather like those of a pineapple, and tall red flower spikes nearly 5 feet high.

*Yucca gloriosa*, Adam's Needle or Spanish Bayonet

This plant grows tall and has long flattened leaves with needle-like points, and bears a long spike of white, bell-shaped flowers. *Y. aloifolia* is very similar but the leaves are a little wider, the flowers appearing in the rains.

##### Smaller succulents

*Bryophyllum calycinum*

A plant growing from a foot to several feet high, with

## THE GARDEN IN THE PLAINS

thick, fleshy green leaves with uneven edges, and drooping bell-like flowers which look rather like greenish-purple grapes tinged with red, appearing in January-February. This plant is very easily propagated, for if a leaf is left lying on damp ground it will throw out roots. It is often seen growing on waste land on the fringe of jungle, and is very suitable for the outdoor rockery.

### *Echeveria metallica* (*Cotyledon metallica*)

This is somewhat similar to the *Bryophyllum*, but the plant is of smaller growth and the leaves are of a purple-brown colour. *E. glauca* (*Cotyledon glauca*) is a small plant with leaves growing in a dense rosette. It is only 3 or 4 inches high, and is suitable for edgings or for a patch on a rockery.

### *Euphorbia bojeri*

This plant has flat scarlet flowers and thorny stems. Nearly always in flower, and of low, shrubby growth. Easily grown from cuttings. Useful for an outdoor rockery.

## Succulents for pot work

*Echinocactus* (prickly globular-shaped plants bearing pinkish flowers), *Echinocereus*, *Echinopsis*, and *Mamillaria* (Nipple cactus), can be raised on the plains with care. The beautiful *Phyllocactus* group are more delicate, however, and rarely seen on the plains. *Epiphyllum truncatum* is a small plant with flat stems growing one from the other, which bears pink flowers. It is rather delicate and needs great care as regards drainage and protection from wind. The Starfish Flower (*Stapelia gigantea*) is sometimes taken for a cactus, but actually belongs to the family *Asclepiadeae*. Some of the aloes are suitable for pot culture, notably *A. intermedia* and *A. saponaria*, with green leaves speckled with white.

The above plants should have a fairly sunny situation, and the potting mixture should be light and porous.

## PALMS, ORNAMENTAL GRASSES AND A FEW SUCCULENTS

### Compost for succulents in pots

- 2 parts clean sand
- 2 parts sifted leaf mould
- 1 part sifted garden soil
- a handful broken brick rubbish per pot
- a little charcoal in small pieces in each pot
- 1 teaspoonful bonemeal per pot

Put a layer of broken brick or potsherds with the hollow sides downwards at the bottom of the pots. Sift sand, leaf mould, soil and bonemeal together. Add a little broken brick and a few small pieces of charcoal to each pot.

### Watering

Cacti need watering very sparingly, the amount to be given depending largely on the state of health of each individual plant, and the climate of the district where they are grown. They need rather more moisture when growing than when they are dormant, but even so they rot very easily if too much is given. Take your climate into consideration, and if it is a rather moist one you may find that the plants will only need watering once a fortnight or even once a month. In drier places try giving water once a week for a start, watch the plants carefully to see how they react, and cut down the supply of moisture if necessary.

## Chapter xi

## GRASS AND LAWNS

'The lawn is the heart of the garden and the happiest thing that is in it.'—William Robinson

Drainage—Levelling—Planting grass—Cutting new lawns—Pale or yellow lawns—Fertilizers for grass—Top-dressing a lawn—Watering a lawn—Weeds—Worm casts—'Fairy rings'—A grass tennis court—Measurements of some games lawns

GREEN grass always rests the eye, and in a hot land a sweep of well-shorn grass has the refreshing quality of a calm green lake. Far shores of massed shrubs or a large tree forming an island of shade add to the feeling of cool restfulness, but the main body of a lawn should not be cut up by too many paths and flower beds.

**Drainage**

No lawn should be dead level in districts where the rainfall is moderate to heavy, for there must be some means of getting rid of surplus water during the monsoon. A very gentle slope, so gradual as to be imperceptible to the eye, is sufficient. A slope of about  $1\frac{1}{4}$  inches in 50 feet is necessary, following the direction of the natural drainage. A good way to discover the natural drainage is to go out in a heavy shower and see how the water runs and where it lodges. A peg driven into the earth with its top level with the surface of the water in water-logged places will give you an idea of the amount of soil required to fill up any hollows.

Protective drains round sunk lawns are essential. These usually consist of a cross drain along the top of the garden which will take the water to drains leading down the sides of the slope to an outlet drain from the low-lying area. (See the section on 'Drainage' in the chapter on 'Soil and Manuring'.)

**A seepage drain**

An open drain round a lawn can be ugly, and in its place a seepage drain, leading eventually to an open outlet drain, is often better. This consists of a trench 15 to 18 inches deep and 12 inches wide, filled to within 6 inches of ground level with broken brick rubble or cinders, and the remaining space at the top packed with light soil and grassed over.

**Levelling**

For an ordinary lawn it is not necessary to level very accurately. Once you have found out a natural drainage slope and water-logged areas (as described above), you can do rough levelling by eye, or by stretching a thin rope taut along the ground across the area to be levelled, and smoothing out any bumps or filling any hollows that are shown up.

Rough levelling is not accurate enough for lawns used as tennis courts, bowling greens, etc. For greater accuracy systematic pegging of the ground and levelling by means of a rod and spirit level is necessary. A description of this type of levelling will be found in the section on 'A grass tennis court'.

**Planting grass**

Most gardeners inherit a lawn comprised of a mixture of grasses, coarse and fine. By careful and prolonged weeding and selection such a lawn may be reduced to some semblance of evenness, but to

## THE GARDEN IN THE PLAINS

approach perfection, it is better to replant it with one type of grass, the procedure being as follows.

In dry weather prepare the ground for grass by digging it to a depth of 12 inches. Then remove and burn roots and weeds. Leave the clods to dry for at least a week or several weeks if possible. Turn the soil again, beat out the clods and just before the first rain level roughly and roll with a light roller. After the ground has been soaked with water fill up any hollows with earth, then roll again when the weather clears.

Dhoob grass (*Cynodon dactylon*), known as *Hariali* in South India, is the best grass for the plains and up to elevations between 3,000-4,000 feet.

Dhoob can be grown from seed sown at the rate of 1 lb. to 200 square yards (according to the directions of Messrs Sutton & Sons), and is best sown just before the rains. Before sowing time level the ground, roll it, and finally rake the surface lightly with a fork. Scatter the seeds as evenly as possible, and cover them with a thin layer of roughly sieved earth.

The more usual method of planting out grass, however, is from the actual grass roots. This method of grassing generally takes one of the four following forms.

(1) Gather roots from nearby roadsides or *nullahs*. After levelling, rake the surface of the ground lightly with a fork and dibble in the roots evenly. Do not use pieces of grass longer than 2 or 2½ inches as these merely dry off. Sieve some dry earth with leaf mould, or failing leaf mould fine soil only, and scatter over the roots. If the weather is dry, water every evening. When the grass is established cut and roll with a light roller.

(2) Sometimes tracts of dhoob grassland can be found. From such, cut sods of grass 9 inches square with the earth still round the roots, and 'pave' your site after having lightly raked the ground underneath.

## GRASS AND LAWNS

Sprinkle earth over the cracks between the sods, then water and beat the square lightly with the flat surface of a *kodali* blade or a flat piece of wood. When the grass thickens over the joins, roll and cut. This is a quick and good method.

(3) Some gardeners advise a grass paste, made by cutting lengths of dhoob 2 inches long and adding them to a mixture of earth, cowdung and wood ashes in the proportion of two baskets of grass to one each of the other ingredients. Sufficient water is added to the mixture to make a paste thick enough to spread evenly over the ground. Do not water until 2 or 3 days after spreading the paste. This method ensures a good start for the grass, but its drawbacks are that weeds are sometimes introduced from the cowdung, and the procedure is rather messy and difficult. As a rule this method is only practicable for small areas.

(4) Another method is to collect grass and cut it into 2-inch lengths, scattering the pieces evenly over the prepared ground. The grass is then covered with a layer of earth sieved with a little sand and leaf mould, and watered every evening. This method avoids the messiness of a wet paste and the risk of introducing weeds. Care must be taken, however, to cover all the pieces of grass with earth.

### Cutting new lawns

When cutting new lawns for the first time do not use a lawnmower, because the barely established grass is apt to be uprooted by the blades. If your *mali* is not particularly skilled at using a sharp scythe, clipping with a good pair of garden shears will answer the purpose.

### Pale or yellow lawns

A pale or yellow lawn may be due to several causes. In districts where the rainfall is heavy the cause may

#### THE GARDEN IN THE PLAINS

be water-logging through poor drainage. In a dry place the reason might be sun-scorch or inadequate watering. A hard soil and nitrogen deficiency are frequent causes of yellowness. The problem of drainage has been dealt with earlier in this chapter, while the questions of manuring and top dressing, cultivating a hard soil and watering are discussed in the sections that follow.

#### Fertilizers for grass

Ready-mixed fertilizers for grass are on the market, but these proprietary mixtures are often expensive. A suitable mixture may be made up as follows, the parts being by weight.

##### Fertilizer

- 2 parts sulphate of ammonia
- 1 part superphosphate
- 1 part sulphate of potash

This, purchased in quantities of not less than 1 cwt. of each chemical ingredient, should not cost more than Rs. 6 per cwt. of mixture. Use 2 to 3 oz. of the mixture to a square yard, or 40 to 60 lb. to a lawn the size of the playing area of a tennis court.

An easy method of distributing the manure is to fill a shallow bamboo basket with earth mixed with  $2\frac{1}{2}$  oz. of the fertilizer, and to spread this over the ground. A basket of about 15 inches diameter across and a depth of 7 inches, holds enough earth when it is heaped up to spread a layer  $\frac{1}{4}$  inch thick over about a square yard. This method has the advantage of providing a top dressing. The general mixture described above should be given in August, or at the beginning of the rains.

On a tennis court, applications of sulphate of ammonia,  $6\frac{1}{4}$  oz. to a  $2\frac{1}{2}$ -gallon can of water, can be watered on the grass once a month from November

#### GRASS AND LAWNS

onwards during the dry season. Ordinary lawns will also benefit by such treatment occasionally.

#### Top dressing a lawn

An occasional thin top dressing of light soil is most beneficial to grass, especially if the lawn is founded on poor soil. This covering with earth takes the place of cultivation which, of course, is impossible in the ordinary way.

Top dressings can be applied just before the early rain, or towards the end of the monsoon in late August. Never smother the grass in earth; a layer  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch deep is enough. Some sort of nitrogenous manure mixed with the soil benefits the grass tremendously. If you have a plentiful supply of leaf mould or compost, this can be sifted and mixed with soil and sand in equal quantities and used for the dressing. An alternative to a bulk manure is the use of chemical manures mixed with the soil, as advised above. Use plenty of soil with the chemicals, otherwise the grass may be scorched. Thin and clean the lawn by raking the surface lightly before applying the top dressing.

If the lawn is founded on stiff, hard ground it often pays to aerate the soil by deep cultivation before applying the top dressing. For this purpose a big, straight *kodali* fork is necessary, with twelve-inch prongs straight in line with the handle shaft. (See the chapter on 'Garden Implements'.) The fork should be plunged into the earth the length of the prongs, in lines 3 or 4 inches apart all over the lawn, the fork being pressed gently backwards and forwards once with each plunge. The object is to open the soil without breaking it into clods, and so aerate it to a depth of 12 inches.

Deep cultivation is best done with the early rain. Let the rain and sun get at the forked ground at least a week before applying the top dressing. When the

#### THE GARDEN IN THE PLAINS

grass has pushed through its covering of earth, cut and roll the lawn. The grass will soon spread over the marks left by the prongs of the fork.

Top dressing is not always practicable for really big stretches of grass because of the labour involved and the amount of earth needed, but a dressing once every year or two is usually possible for smaller lawns, and the improvement in the grass makes all the trouble worth while.

#### Watering a lawn

In dry, hot weather it is essential to water grass if it is to remain the refreshing green which is so precious. It is better to water thoroughly occasionally, however, than to give a light daily sprinkling that will remain near the surface and evaporate in a few hours of hot sun.

If you have a copious water supply, it is a good plan to leave the lawn sprinkler in one place all night, thus soaking the ground thoroughly within its range of action. Every night move the sprinkler to another place so that eventually the whole lawn receives a systematic soaking. Should there be no water laid on, water the lawn by hand very thoroughly in small sections every evening.

#### Weeds

The constant cutting down of the leaves of a weed starves the roots and prevents seed formation, and so kills the weed eventually. Lawns should be searched for weeds periodically. A light raking removes surface weeds and dead roots, but if the grass has been neglected for some years and the more serious weeds have gained a stranglehold, the only course is to dig the ground and re-lay the lawn. Rake the dug earth well for the runners of *motha* or nut-grass (*Cyperus rotundus*) and such vicious weeds. This raking must

#### GRASS AND LAWNS

be done very thoroughly, for if the smallest pieces of *motha* remain in the ground the trouble will start all over again. The best time for this task is right at the end of the dry weather, so that the new grass gets the benefit of the early rain.

Here are a few names of particularly vicious weeds.

|                                                                  |                                                                                                    |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <i>Cyperus rotundus</i> , <i>Motha</i> ,<br>or nut-grass.        | With bulblets and long runners underground.                                                        |
| <i>Imperata arundinacea</i> ,<br>or <i>Ulu</i> .                 | Both these have straight, sharp foliage and deep roots, and are apt to appear on low-lying ground. |
| <i>Saccharum spontaneum</i> ,<br><i>Rarhi</i> , or <i>Kash</i> . |                                                                                                    |

Proprietary weed-killers are on the market for use on drives and paths, but they are not really satisfactory in India where the influx of weeds from outside is constant. Paths founded on a brick or gravel core are not so likely to grow weeds as those based on ordinary garden soil. Many weed-killers contain poisons which are dangerous to any pets you may have, but one containing common salt only can be used safely.

#### *Poisonless weed killer for use on drives and paths*

- 1 lb. common salt
- 1 gallon hot water

Apply as hot as possible through a watering-can with a fine rose.

#### Worm casts

Although worms are valuable as a means of aerating the ground, worm casts are ugly on grass and a well-laid lawn, adequately drained, does not need unlimited worms for its aeration. As a cure use *mowrah* cake (the crushed seed of *Bassia latifolia*). Broadcast the pulverized cake at the rate of 2 to 2½ oz. per square yard when the soil is moist after rain or water-

## THE GARDEN IN THE PLAINS

ing, and the worms will come to the surface. There are various proprietary worm eradicators on the market.

### 'Fairy rings'

'Fairy rings' are due to a fungus which spreads from the point of infection in rings. The fungus first attacks the grass, turning it brown, and then moves outwards in an ever-widening circle. The brown area recovers, once the fungus has moved on, and turns lush and green, this part forming the 'fairy ring'. This disease is not common on tropical lawns.

Should grass be disfigured by 'fairy rings', the best way to overcome them is by watering with a suitable solution. Copper sulphate, used at the rate of 2 oz. to 2½ gallons water, or 4 oz. iron sulphate to 2½ gallons water, can be applied. Copper sulphate may not be used in the ordinary watering can, but should be applied from a wooden or earthenware vessel. The exact strength of the solution and the number of applications required will depend on weather and other conditions so that experiment is necessary. When watering with the solution the outer rim of the ring should be treated, where the fungus is active.

### A grass tennis court

When selecting a site for a court remember that it should lie north and south, or north-west and south-east so that the players are not worried by the evening sun.

The area of the actual court is 78 by 36 feet (see Fig. 17), but as it is necessary to allow for a run-back and space at the sides, a total area of about 110 by 50 feet is required.

As a preliminary to making a court, the ground should be well dug, the clods of earth broken and

## GRASS AND LAWNS

the surface roughly levelled. Before starting the final levelling the earth should be allowed to settle.

### Levelling a tennis court

For accurate levelling it is necessary to have a spirit level and 55 wooden pegs. These pegs should be 12 inches long with tops 2 inches square and pointed

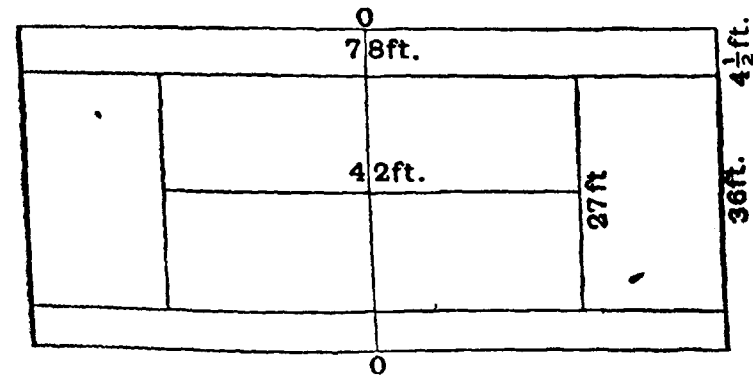


FIG. 17. PLAYING AREA OF A TENNIS COURT

ends, and a mark should be scored on each peg 6 inches from the top. You must also have one straight wooden batten 10 feet 6 inches long, 2 inches wide and 2 inches deep, and one small block of wood, 2 inches square and 1¼ inch thick.

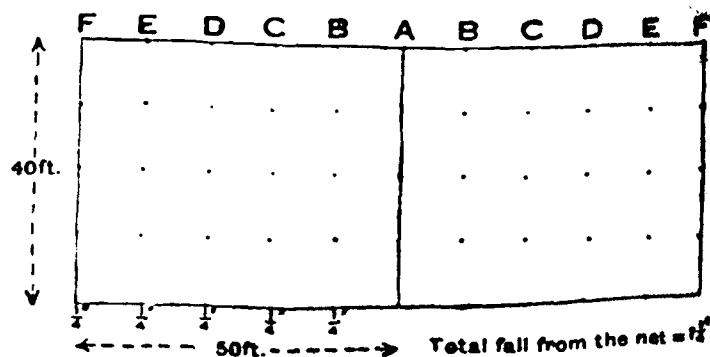
Fig. 18 (a) and (b) illustrates how levelling should be carried out.

In the centre of the court, at the line of the net, drive in one peg to the 6-inch mark. On either side of this peg and along the line of the net, drive in two more pegs at 10-foot intervals. There are now five pegs in a line covering a length of 40 feet. The pegs on either side of the centre peg should not be driven far into the ground at first. Put one end of the batten on top of the centre peg, and the other end on a peg next to it. Place the spirit level on the centre

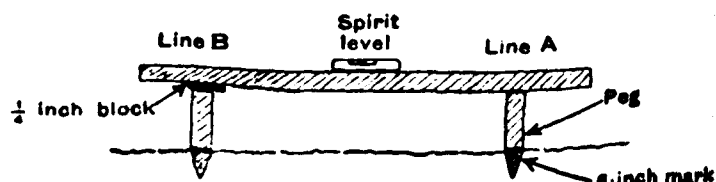
## THE GARDEN IN THE PLAINS

of the batten, and the position of the bubble will indicate how far the second peg has to be driven in so that its top is level with that of the centre peg. When the two pegs are level, the bubble in the spirit level will be in the centre of its run.

In a similar manner the other three pegs should be levelled against their neighbours so that all four will



(a) Diagram showing the pegging of a tennis court to be levelled  
A is the net line, and F F the back lines.



(b) Diagram showing the levelling of line B against line A, with the use of the  $\frac{1}{4}$ -inch block

FIG. 18. LEVELLING A TENNIS COURT

then be level with the centre peg. The 6-inch marks on the pegs on either side of the centre peg will show how much levelling is required. If the mark is below the ground, soil must be removed; if the mark is above the ground, soil must be added to reach

## GRASS AND LAWNS

the mark. Thus the net line is levelled [A in Fig. 18 (a)].

On one side of the net line at a distance of 10 feet, put a parallel line of pegs [marked B in Fig. 18 (a)] at 10-foot intervals, as in the original centre line. Place one end of the wooden batten on the centre peg of line A and the other on the centre peg of line B, on the top of which has been placed the small wooden  $\frac{1}{4}$ -inch block. Put the spirit level on the batten as before, and drive in the peg in line B until the bubble is central. On subsequently removing the  $\frac{1}{4}$ -inch block it will be found that the top of the peg in line B is  $\frac{1}{4}$ -inch lower than the centre peg of line A. If the 6 inch mark on the peg in line B is level with the ground, then the slope is correct. If it is above or below the ground, soil must be added or removed accordingly. Each peg in line B is levelled with its fellow in line A in a similar manner.

The five pegs constituting line C are now levelled against those in line B. With the use of the  $\frac{1}{4}$ -inch block, line C will have dropped  $\frac{1}{4}$  inch below line B. Lines D, E and F each drop  $\frac{1}{4}$  inch below the preceding line, making a total drop of  $1\frac{1}{4}$  inches in 50 feet.

In the same way lines B, C, D and F on the other side of the net line A, are levelled. The drainage slope thus more than covers the playing area. Having levelled each line of pegs, a thick string stretched taut along the ground from the net line to each end of the court will show up any hollows or hillocks on the ground between the lines of pegs.

In districts where the rainfall is heavy the construction of a seepage drain outside the surrounds is an advantage. (See the sub-section 'A seepage drain' in this chapter.)

*Setting the corners square*

Care must be taken that the court is set out square. If no instrument is available for fixing the right angles at the corners, they may be checked as follows. Form a corner A, mark a point 12 feet along the back line and call it B. From A mark another point 9 feet along the side line and call it C. If the angle between the two lines is a right angle, the diagonal line B-C should measure exactly 15 feet. If the line is less than 15 feet, then the angle is less than a right angle, and vice versa.

*Grass for a tennis court*

The planting of roots of *dhoob* grass is the cheapest way to grass a tennis court and is quite a satisfactory method. The best alternative to this is to sow *dhoob* grass seed.

**Measurements of some games lawns**

*Tennis court*: Regulation size 26×12 yards (78×36 feet), to which must be added a suitable border. Detailed marking of a tennis court is shown in Fig. 17.

*Bowling green*: 42 yards square, dead level and surrounded by a covered seepage drain.

*Badminton or deck tennis*: The size of the double court is 21×42 feet, and of the single court, 15×36 feet.

*Croquet lawn*: Regulation size is 35×28 yards, or with surrounds, 40×33 yards.

HEDGES

'Go thou, and like an executioner,  
Cut off the heads of too fast growing sprays,  
That look too lofty in our commonwealth :  
All must be even in our government.'

—King Richard II



Barriers—Demarcation hedges—Wind breaks—Planting a hedge  
—Clipping hedges—Small edging plants

**Barriers**

AMONG the various uses of a hedge the most important is that of an impenetrable barrier. The thornless hedge plants mentioned later can be used for this purpose, provided an adequate fence protects the hedge outside; but if your property is not protected by a goat-proof fence, a thorny, dense hedge is essential. The following plants are thorny in varying degrees, and when established will keep out four-legged intruders. It is, however, advisable to thread a few strands of barbed wire between temporary posts behind such hedges while they are too small to be of much use as a protection.

*Bougainvillea*

These plants make decorative barriers and can be allowed to ramble along wires, or may be clipped and thickened to form a neat hedge, when the blooms powder the surface with colour. *B. glabra* and *B. spectabilis* are the varieties most commonly used for hedges.

*Caesalpinia sepiaria*

This is a thorny creeper found in dry parts. It can be formed into a hedge, effective for its purpose, but untidy and unattractive to look at.

*Duranta*

*D. plumieri* and the cream and green-leaved *D. variegata* make firm hedges. They do not form such an impenetrable barrier as some others mentioned here, but the plants are infinitely more decorative and suitable for the average garden. The hedge is rather apt to look thin in the cold weather, but it is a refreshing green in the hot months.

Durantas are often grown as single shrubs on account of the sprays of mauve or white flowers and the golden berries that follow. As a severely clipped hedge, of course, there are few flowers or berries.

*Inga dulce* (*Pithecolobium dulce*), or Madras Thorn

This is really a small tree, but it can be pruned to hedge form, and constitutes a tall, impenetrable barrier.

*Parkinsonia aculeata*

Not a decorative plant, but it makes a firm boundary in very dry districts where other hedge plants are difficult to rear.

**Demarcation hedges**

A secondary use for a hedge is to divide the garden within itself, the vegetable garden from the flower garden, a formal garden from the big lawn, or to screen off a corner for potting operations. For this purpose the hedge need not be of a thorny nature.

*Acalypha*

The foliage types of *Acalypha* make effective hedges if not too severely clipped.

*Achania malvariviscus*

A shrub with foliage resembling that of the hibiscus. It can be trimmed to form a neat hedge, and grows easily from cuttings. Grown as a single plant, flowers like small scarlet sunshades, half furled, appear on and off throughout the year.

*Barleria*

*B. cristata* with white or blue flowers, and *B. strigosa* with yellow flowers, can both form a dense hedge where a high screen is not needed.

*Buddleia lindleyana*

The mauve flowers and grey-green leaves of this plant are often seen in the hills clipped and trained as a hedge. It can be grown in the same way in some plains districts.

*Daedalacanthus nervosus*

This plant has very dark green leaves and makes an attractive hedge. Unless it is clipped severely it bears pale blue flowers in February.

*Dodonaea viscosa*

This shrub has insignificant pale green flowers, and makes a thick evergreen hedge. Easily grown from seed.

*Hamelia patens*

A tall shrub with reddish-green foliage and small orange tubular flowers. It makes a high, shrubby hedge.

*Hibiscus*

The common red type which does not look too thin in cold weather will make a particularly effective hedge. It is quick growing, of a dense, dark green, and can be clipped into a neat conventional hedge most suitable for the formal garden.

*Ixora stricta*

This shrub is sometimes used in the more humid districts for a low ornamental hedge, but being of slow growth it is not recommended when a tall screen is wanted quickly.

*Lantana*

This shrub, seen so often colouring waste lands, is sometimes used as a hedge plant. As it is of rampant growth it must be carefully pruned and thickened to make a neat hedge. It is apt to look bare at the bottom.

*Lawsonia alba*, or Mehndi

This shrub is often grown as a hedge, being easily raised from either cuttings or seed. It is commonly seen in the drier districts.

*Murraya exotica*, or Chinese Box

An evergreen shrub, very popular for hedges. As a single shrub it produces sweet-scented white flowers several times a year.

## THE GARDEN IN THE PLAINS

### *Plumbago capensis*

This plant makes a pretty, flowery hedge if it is severely clipped, and is often used for this purpose in Southern India.

### *Thevetia neriifolia*

This shrub is sometimes seen pruned to hedge form.

### Wind breaks

Wind breaks are usually classed in the same category as hedges. In humid districts they sometimes take the form of a line of tall bamboos some distance outside the garden boundary, protecting the property from strong winds. Any tall, dense hedge within the garden acts as a wind break to a certain extent if rightly placed, the dwarf bamboo *Bambusa nana* being particularly good for the purpose. *Haematoxylon campechianum* or Logwood, is a pretty little tree 10 or 12 feet high, and is often planted as a tall hedge or wind break in the drier districts.

### Planting a hedge

Make a trench the length required for your hedge and 18 inches to 2 feet wide. Dig the soil well to a depth of 2 feet, add a layer of leaf mould, compost or decomposed cattle manure and mix it with the earth.

Most hedge plants grow from cuttings. Choose half-matured wood the thickness of a finger, cut it into lengths of nine inches, and take off the leaves. The sticks should be cut diagonally just below a leaf bud and planted at a slight slope criss-cross along the centre of the trench, one-third of their length being in the earth.

If you are short of good cuttings, green shoots can sometimes be used as thickening for the hedge. Green shoots usually do not do as well as half-matured wood a year old, because they have no reserves with

## HEDGES

which to withstand dry weather, but they are better than very old, moribund wood. Planted in the wet season green shoots often strike readily, and in particular the young shoots of *duranta* do well.

Make the trenches towards the end of the dry weather and put down the cuttings with the early rain. Cuttings and seedlings planted before the rains have arrived should be watered and given light shade by means of leafy branches which are stuck at a slant into the earth at the sides of the trench and bent over to protect the cuttings.

Some hedge plants, *Dodonaea viscosa* for one, shed seed profusely. These can be gathered from a mature shrub and sprinkled along the prepared trench. Cover them with a thin layer of earth, and spread a few brambles along the bed as a protection against careless feet.

### Clipping hedges

Severe clipping reduces flowering, but encourages leaf growth and thickens the form of the hedge. A common mistake is to cut a hedge so that the top is wider than the bottom. This is very ugly and means thick growth at the top and bare branches below. It is really better to have the base very slightly wider than the top, the effect being far more pleasing than the reverse. Best of all is a hedge with straight sides, if the *mali* can be trained to achieve this. A straight rod on a flat wooden base, the height of the hedge, can be used as a guide while the hedge is being cut.

Many *malis* leave the hedge to grow its own way, and do not clip it until it has reached its final height. This treatment results in a thin and straggly frame, and it is important to start clipping and shaping when the hedge is only a foot or so high. At first both height and side growth should be checked so that

## THE GARDEN IN THE PLAINS

the base of the hedge thickens nicely, then height should be gained gradually, cutting back 3 inches after every 6 inches of new growth.

### Small edging plants

Some people with very tidy minds like to have neat little edging plants outlining paths or flower beds. Here is a short list of plants suitable for this purpose.

#### *Alternanthera*

A small plant with either bronze-red or green foliage. Can be clipped to form a low, neat edging about 6 or 8 inches high. Easily increased by cuttings. If grown in the shade the leaves are apt to be more green than red.

#### *Ophiopogon intermedius* var. *variegata*

A small plant with narrow variegated leaves and pale mauve flowers. Useful for a shady, rather moist situation.

#### *Phalaris arundinacea*, or Ribbon Grass

A small grass with variegated leaves.

#### *Pilea muscosa*

This is a rather moss-like, fresh green plant. Easily increased by cuttings.

#### *Dodonaea viscosa*, *Duranta*, *Malpighia coccifera*, *Murraya exotica*, and *Ixora stricta*

These shrubs can be clipped to form an edging a foot or so high.

## Chapter xiii

# FERNERIES AND POT PLANTS

'In my garden there is a green refuge  
from the dust and glare outside.'

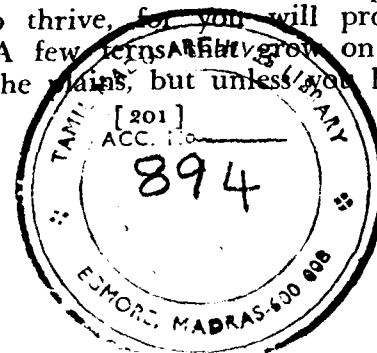
Kathleen L. Murray: *My Garden in the Wilderness*

Propagation of ferns—Potting ferns and other fern-house plants—How to prepare pots or hanging baskets—Home-made hanging baskets—Watering ferns and pot plants—Types of ferneries—Situation and structure of a fern-house—PLANTS FOR A FERNERY

AN Indian fernery is an attractive place, cool and restful, in which to potter while the outside world bakes and sizzles. There are many types of ferns to collect, and a variety of glowing foliage plants available to mass against the green background.

There are fashions in gardening as in other things, and nowadays a well-stocked fernery is seldom included in the small garden. This may be due to lack of space, or perhaps on the grounds of expense, but it seems to me that a small garden is just the place for a fernery. When there is not room enough for wide lawns and many different kinds of ornamental shrubs and trees, one can introduce variety by cultivating a selection of interesting pot plants in a little fernery tucked away in a corner.

When collecting ferns, do not bring delicate, lacey types from high elevations down to the plains and expect them to thrive, for you will probably be disappointed. A few ferns which grow on the hills also thrive on the plains, but unless you have some



## THE GARDEN IN THE PLAINS

previous knowledge on this subject you may waste much time and trouble in transferring those that will repay you only by wilting away.

Generally speaking, the following factors are essential for cultivating ferns successfully: shade, moisture, protection from wind, good drainage and a light soil. Some ferns thrive with less shade than others and a few stand full sun, but all require good drainage, for ferns like moisture but not water-logging.

### Propagation of ferns

Ferns are of a more primitive order than flowering plants inasmuch as they propagate not by seed, but by spores. The latter usually occur on the undersurfaces of the leaves in little dark brown cases (sporangia). The growth of a fern from the spore is a complicated and lengthy procedure, for the spore itself gives rise to an intermediate form which in turn produces the fern.

To grow ferns from spores, fill a shallow earthenware bowl with a layer of broken brick covered by sand mixed with a little sifted leaf mould. Lay the mature fronds, which carry sporangia, on the top of this sand, stand the bowl in water and cover it with a pane of glass. The spores are eventually discharged from their cases, the intermediate phase develops and finally a new fern grows. Another method is to sow the spore cases on a mossy brick, stand the brick in a little water and cover it with a bell glass or glass bowl. Most ferns grown on a shady rockery will in time reproduce themselves by spores.

By far the easiest and quickest method of fern reproduction is by division of roots. This is done simply by pulling apart the roots very gently, and planting each piece separately to form a fresh clump.

## FERNERIES AND POT PLANTS

### Potting ferns and other fern-house plants

Division of the roots and re-potting ferns or other pot plants should only be undertaken when signs of strong new growth appear. This usually takes place in the early rains. Re-potting is often a cure for a sickly plant which gets a fresh start in new soil, but ordinarily plants only need re-potting when they have thickened unduly and their roots fill the pots. In most cases re-potting is necessary once a year. Do not disturb ferns until the time for dividing their roots comes round again, but snip off any dead fronds close to the stem as they wither.

The best way to loosen a fern or other plant from its pot is to hold it upside down in one hand, with the stems projecting through the fingers, and tap the bottom until the contents are loosened. Should the earth round the roots have become hard, put the latter in water until the earth softens, then divide and plant at once. All pieces of dead fronds, leaves, stems or roots should be removed before putting the plants in their new quarters. Potting operations should be carried out in a cool and shady place.

### Leaf mould

Leaf mould is excellent for pot plants. It consists of leaves, grass and fine vegetation with a slight mixture of earth, all left in a damp heap to rot. It is worth keeping leaf mould on hand for fernery plants.

### How to prepare pots or hanging baskets

Good drainage being essential, before filling pots with a compost they should be lined at the bottom with a 2-inch layer of potsherds (with the concave or hollow sides downwards), or else with broken brick covered with a very thin layer of coir fibre, dry leaves on dry moss. This layer of fibre or moss keeps the drainage material clear of clogging earth.

#### THE GARDEN IN THE PLAINS

It is not necessary for wire baskets to have the layer of broken brick or potsherds for drainage purposes, but they need some coir fibre or moss at the bottom and round their sides to prevent the earth falling through the mesh.

Use 8 to 10-inch pots, no larger. It is a mistake to use pots too large for the root growth of a plant, for too big a pot leads to excessive leaf growth and poor flowering. Even ferns do not thrive well in pots which are much too big for them.

Scrub the pots inside and out before putting in the drainage material and filling them with earth. Moisten the compost slightly all through so that it is crumbly and fill the pots to within an inch of the rim.

#### *A compost for ferns and most fern-house plants*

- 1 part sand
- 2 parts well-sifted leaf mould
- 1 part soil
- 1 part charcoal, broken into tiny pieces

or

- 1 part small pieces of mortar or lime-concrete, the size of peas, with the dust.

Sift sand, leaf mould and earth together, then add the charcoal or pieces of lime-concrete.

Ferns and other pot plants may vary in their degree of appreciation of lime, but it would seem that varieties of *Adiantum* (maidenhair fern) definitely like this substance. Begonias appear to like lime, and a little should be included in their compost.

A thin layer of tiny pieces of broken brick placed on top of the soil round the plant is a help in distributing the moisture evenly when watering, and acts as a protection for the surface roots of the plant.

Never let potted plants stand directly on the floor

#### FERNERIES AND POT PLANTS

or on a solid brick stage, but raise the pots on three bricks or stones, so that air can pass freely beneath them.

#### Home-made hanging baskets

##### *A round wire basket*

Take some  $\frac{1}{2}$ - or  $\frac{3}{4}$ -inch wire mesh and some fine soft galvanized wire. Cut a strip of the mesh about 30 inches long and 6 inches deep, and bend it round so that the ends meet. Bind the flat join with wire. Cut a round piece of the mesh large enough to form the bottom of the basket and bind it on with wire. Brace the top of the basket with a circle of split bamboo attached with wire.

##### *Square wire basket*

Cut a square of mesh  $27 \times 27$  inches. At 6 inches from each corner cut 6 inches into the square of the mesh, taking out the corner sections thus set free. The remaining piece will be cross-shaped. Fold to form a square container, binding the corners with wire. Brace the top edge with pieces of split bamboo bound on with wire.

These baskets are much lighter in appearance than wooden baskets or earthenware crocks for hanging purposes. Pliers can be used to cut the mesh if wire-scissors are not available.

##### *A wooden basket*

Take 16 pieces of wood, 15 inches long and 1 inch thick. Arrange them four a side, with the ends interlacing and projecting slightly, in such a manner that there is a space between each piece of wood. Fasten the pieces together with nails. Flat slats, with  $\frac{1}{4}$ -inch space between each, form the floor of the basket. Treat the wood with a wood preservative.

#### Watering ferns and pot plants

Ferns love moisture and will need daily watering in the evening all the year round if under cover, and possibly twice a day in the hot, dry period. Provided ferns and pot plants have a porous compost and good drainage, a thorough watering is good.

## THE GARDEN IN THE PLAINS

A good way to keep the atmosphere of a fern-house humid in dry weather is to spray the walls and floor with water several times a day. The leaves of foliage plants need cleaning by gently syringing them with water two or three times a week, and more often in the very dry and dusty months, so that the pores of the leaves are not clogged by dust.

A supply of water within a short distance of the fern-house is essential. A small reservoir of water inside the house helps to keep the atmosphere humid.

### Types of ferneries

The type of structure you have to house your ferns depends largely on the locality. In fairly dry districts a separate fern-house is the best place for growing all ferns and small foliage plants requiring partial shade. Delicate plants always need the controlled conditions which are only possible in a proper fern-house, but in humid districts a compromise is often possible when housing hardy types.

In comparatively moist districts like Assam or Sylhet it is possible to have an outdoor fernery provided it is in a really protected and shady spot. This might take the form of a fern-covered rockery (see the chapter on 'Rockeries'), or a large, shady old tree converted into a bower of ferns. Some big trees have gnarled roots looping out of the ground, and the space between these roots can be used to house clumps of lilies or hardy ferns, provided the pockets are filled with a prepared compost, while orchids can grow on the branches themselves. A tree fernery is not always an unqualified success, however, as ferns have a definite dislike of overhead drip. Outdoors this cannot be avoided, but it is as well to remember that although hardy ferns and lilies may survive, delicate types will not stand excessive drip without

## FERNERIES AND POT PLANTS

rotting. Be sure and choose a tree which does not give too dense shade.

Some bungalows in India are built on a *chang*; that is, they are raised ten feet or so above the ground on iron supports leaving a space between the bottom floor and the earth. The portion of this space facing east or north-east makes an adequate fernery for hardy plants. If pot plants are kept too far towards the centre of this space below the bungalow, however, they may become debilitated and grow towards the light. Consequently, the plants should be placed only on the east and north-east rims, as it were.

The veranda of a plinth bungalow can house a selection of hardy fern-house plants in pots, provided it is on the shady and protected side of the house.

### Situation and structure of a fern-house

A thatched structure must be well away from the bungalow on account of fire risks. Avoid any low-lying place subject to water-logging, and if possible choose a site out of the track of strong winds. The protection of trees or a hedge is a help in windy districts, but overhead drip or the shade of big trees should be avoided.

The object of a fern-house is to protect the plants from wind, excessive cold or heat, and to diffuse the light so that the plants live in the semi-gloom that they require. A small fernery built lightly of bamboo will be adequate for a year or so, but a metal frame is more satisfactory.

The easiest shapes to build are squares, oblongs, hexagons or octagons, according to the size of the house required, with posts at the angles. These posts should be 8 to 10 feet apart, and can be of angle or T-iron, old rails or pipes. They should be at least 8½ to 9½ feet above ground with 2 to 2½ feet in the earth. It

## THE GARDEN IN THE PLAINS

is best to bed the underground portions of the posts in concrete, or else sink them in holes packed with broken brick. If wood is used instead of iron, the posts must be painted with some preservative and the underground parts earth-oiled or tarred in addition. Use the hardest local wood procurable, avoiding sap wood.

If expert help is available an arched roof looks best, but a flat roof is often easier for an amateur to build. For a flat roof crossbars of H-iron, T-iron, slender pipes, or slats of wood treated with a preservative, should form a light frame, with the ribs of the frame joining the outer posts and crossing the centre from post to post. Whether extra supports for the centre of the roof are needed depends on the size of the house and the skill with which it has been built. Any home-built house larger than 10×10 feet will be better for additional support in the centre. The pillars can be disguised by foliage creepers.

One-inch wire netting makes a good covering for both sides and roof, bound on to the posts and roof ribs with galvanized wire. Light creepers can be grown round the sides on the wire netting provided the roots are bedded well outside the fern-house, and the creeper itself is lacy and sufficiently controlled to allow enough light to penetrate inside. The most satisfactory covering for the roof consists of strips of thatch grass woven in a loose open-work mesh giving half light and half shade, and bound firmly to the wire with strands of shredded bamboo. An alternative to thatch is a double layer of very loosely woven coir string mesh. If the shade is too dense the plants inside will be sickly. On the other hand, in blazing dry weather it may be necessary to reinforce the roof with an extra layer of thatch, which must be removed at the end of the hot, dry period.

[ 208 ]

## FERNERIES AND POT PLANTS

If you decide to have a rockery inside the fern-house, it should be placed towards the centre (see the chapter on 'Rockeries'). Should wooden pot-stands be your choice, they look well tiered, and built of slats of strong wood painted green. Brick stands with receding shelves are sometimes used. Avoid set formations when grouping either stands or rockeries, as the effect of a path winding through banks of green is much more intriguing than a dull, straight walk between ranks of orderly stands.

Paths ought to be at least a yard wide and covered with rough material such as gravel or cinders as a precaution against slipping on a slimy mud floor.

Exposed parts of the house should not face the afternoon sun, so it is best to have the entrance on the north or north-east side of the house. It is advisable to have a door that can be locked if necessary. This door can have a light wooden frame and wire-mesh panels, with two extra iron or wooden posts as door jambs.

## PLANTS FOR A FERNERY

### Ferns for pot cultivation

*Adiantum*, or Maidenhair Fern

*A. capillus veneris*, *A. tenerum*, *A. cuneatum*, *A. trapeziforme*, *A. peruvianum*, *A. gracillimum*.

*Asplenium nidus-avis*, or Bird's-nest Fern

This is a handsome fern with pale green fronds ribbed with brown, about a yard long. Its structure forms a bowl which collects fallen leaves, etc., so that it looks like a huge bird's-nest.

*Blechnum*

*B. boreale*, *B. occidentale*

*Cheilanthes argentea*, or Silver Fern

*Gymnogramme chrysophylla*, or Gold Fern

Will stand full sun.

[ 209 ]

#### THE GARDEN IN THE PLAINS

is best to bed the underground portions of the posts in concrete, or else sink them in holes packed with broken brick. If wood is used instead of iron, the posts must be painted with some preservative and the underground parts earth-oiled or tarred in addition. Use the hardest local wood procurable, avoiding sap wood.

If expert help is available an arched roof looks best, but a flat roof is often easier for an amateur to build. For a flat roof crossbars of H-iron, T-iron, slender pipes, or slats of wood treated with a preservative, should form a light frame, with the ribs of the frame joining the outer posts and crossing the centre from post to post. Whether extra supports for the centre of the roof are needed depends on the size of the house and the skill with which it has been built. Any home-built house larger than 10×10 feet will be better for additional support in the centre. The pillars can be disguised by foliage creepers.

One-inch wire netting makes a good covering for both sides and roof, bound on to the posts and roof ribs with galvanized wire. Light creepers can be grown round the sides on the wire netting provided the roots are bedded well outside the fern-house, and the creeper itself is lacy and sufficiently controlled to allow enough light to penetrate inside. The most satisfactory covering for the roof consists of strips of thatch grass woven in a loose open-work mesh giving half light and half shade, and bound firmly to the wire with strands of shredded bamboo. An alternative to thatch is a double layer of very loosely woven coir string mesh. If the shade is too dense the plants inside will be sickly. On the other hand, in blazing dry weather it may be necessary to reinforce the roof with an extra layer of thatch, which must be removed at the end of the hot, dry period.

[ 208 ]

#### FERNERIES AND POT PLANTS

If you decide to have a rockery inside the fern-house, it should be placed towards the centre (see the chapter on 'Rockeries'). Should wooden pot-stands be your choice, they look well tiered, and built of slats of strong wood painted green. Brick stands with receding shelves are sometimes used. Avoid set formations when grouping either stands or rockeries, as the effect of a path winding through banks of green is much more intriguing than a dull, straight walk between ranks of orderly stands.

Paths ought to be at least a yard wide and covered with rough material such as gravel or cinders as a precaution against slipping on a slimy mud floor.

Exposed parts of the house should not face the afternoon sun, so it is best to have the entrance on the north or north-east side of the house. It is advisable to have a door that can be locked if necessary. This door can have a light wooden frame and wire-mesh panels, with two extra iron or wooden posts as door jambs.

#### PLANTS FOR A FERNERY

##### Ferns for pot cultivation

*Adiantum*, or Maidenhair Fern

*A. capillus veneris*, *A. tenerum*, *A. cuneatum*, *A. trapeziforme*, *A. peruvianum*, *A. gracillimum*.

*Asplenium nidus-avis*, or Bird's-nest Fern

This is a handsome fern with pale green fronds ribbed with brown, about a yard long. Its structure forms a bowl which collects fallen leaves, etc., so that it looks like a huge bird's-nest.

*Blechnum*

*B. boreale*, *B. occidentale*

*Cheilanthes argentea*, or Silver Fern

*Gymnogramme chrysophylla*, or Gold Fern

Will stand full sun.

[ 209 ]

## THE GARDEN IN THE PLAINS

### *Nephrolepis*

*N. cordifolia*, *N. duffii*, *N. exaltata*, *N. furcans*

### *Onychium japonicum*

Has spray-like fronds.

### *Polypodium*

*P. horsfieldii*, *P. wallichii*.

### *Pteris*

*P. quadriaurita* var. *argyrea*, *P. aspericaulis* var. *bicolor*,  
*P. cretica* albo-lineata, *P. serrulata*

### Ferns for hanging baskets

*Adiantum caudatum*

*Blechnum boreale*

*Davallia fijiensis*

*Lygodium circinatum*, *L. scandens*

### Other plants for hanging baskets

#### *Achimenes*

The purple-flowered variety is best for the plains. Plant the tubers about February, one in the centre of each basket, one inch beneath the earth. The soil must be light and rich. As the plants appear, pinch their tips to thicken them and make them spread. Water regularly. In bloom June-October. Allow the plants to die down in November by gradually withdrawing water.

#### *Asparagus sprengeri*

This plant has trailing green foliage sprays, and is easily grown from seed.

#### *Panicum variegatum*

This is a creeping grass which looks pretty trailing from a hanging basket. It is streaked pink and white with wavy edges.

#### *Pellionia*

Creeping plants with succulent leaves. *P. pulchra*, purplish, and *P. argentea*, silver.

## FERNERIES AND POT PLANTS

### *Tradescantia zebrina* (*Zebrina pendula*)

This is a pretty, trailing foliage plant, the leaves being banded with purple undersurfaces.

### *Verbena erinoides*, or Moss Verbena

A perennial verbena with small flower heads in white, mauve or pink. It needs sun, so is not suitable for a true fernery.

### Pot plants for the fernery

There is an almost inexhaustible choice of foliage plants available for a fernery, and the following list gives a few only to make a start with. A few more plants are mentioned in the lists at the end of the chapter on 'Rockeries'.

#### *Aglaonema*

Foliage plants with fleshy blotched or variegated leaves.

#### *Alocasia*

These are handsome foliage plants with tuberous roots, easily propagated by division. *A. sanderiana* has dark green leaves with wavy edges and silver veins. *A. putzeii* and *A. singaporiensis* are also beautiful. These plants need good drainage and some lime in the compost. They should be allowed to die down annually by gradually withdrawing water about October. Store the tubers in a dry place and re-pot in fresh mould in March. (See the section on 'Storing bulbs and tubers' in the chapter on 'Lily Bulbs and Tubers'.)

#### *Anthurium*

There are both foliage and flowering types of these plants. Of the foliage class, *A. crystallinum* is handsome with large leaves of velvety green with silver veins, and *A. warocqueanum* has giant leaves 2 or 2½ feet in length. *A. chelsiense*, *A. desmetianum*, *A. andreanum* and *A. ferrierense* have flowers in various shades of bright red or crimson. *A. carnea* is rose pink, and *A. Archduke Joseph* a pretty light pink. There are also some attractive butter-yellow hybrids.

#### *Apluda aristata*

This miniature bamboo-like grass is often seen potted in a fernery. Propagated by division.

## THE GARDEN IN THE PLAINS

### *Begonia*

A few of the fibrous-rooted varieties do well in the plains. Try the pink or white *semperflorens* and *discolor*. They require moisture, good drainage, and some lime in a light but rich compost. A leaf planted in sandy soil develops root-tissue and forms a complete plant. Strike the leaves or divide the roots early in the rains. Grow the plants in raised beds edging a fernery and you will have sheets of frothy pink flowers.

The semi-scandent shrub-begonia *President Carnot* is a handsome plant to have in a fernery.

### *Caladium*

These foliage plants have broad, pointed leaves splashed with white, red or pink. They are very handsome plants and a great standby for the fernery, their treatment being identical with that of *alocasia* mentioned above. *C. humboldtii* is a pretty dwarf variety with green leaves splashed with silvery white.

### *Coleus*

These plants have beautiful leaves in many rich shades of red and yellow. They are easily raised from seed or cuttings. Pinch the tips to make bushy plants, and give them rich soil. *Coleus* can be pruned in the winter, but as they are rapid growers and consequently become quickly exhausted, it is as well to renew the plants every second year by means of cuttings.

*C. forskohlia* is a type grown for the sake of the spikes of its pale blue flowers. *C. thyrsoidea* has bright blue flowers and small leaves.

### *Costus igneus*

A fleshy plant with bright orange flowers.

### *Dieffenbachia magnifica*

A foliage plant with leaves a foot long and four inches wide, dark green blotched with yellow. There are many other varieties with variegated leaves.

### *Dracaena*

The dwarf varieties are excellent for pot work. They have leaves a foot or so long in lovely bronze tones, or

## FERNERIES AND POT PLANTS

mixed colours in dark green, cream or rosy red. Easily propagated by cuttings.

### *Impatiens sultani*

This plant is a kind of balsam, with bright cerise flowers, and grows about 12 to 15 inches high. There are other varieties, very similar, with white, scarlet or pale pink flowers, but the cerise is the hardiest and most commonly seen. Easily grown from cuttings.

### *Iresine*

*I. herbestii* has reddish foliage, *I. aurea-reticulata* green veined with red. Both these small shrubs are very hardy and easily reproduced by cuttings.

### *Maranta*

Ornamental foliage plants. *M. zebrina* (*Calathea zebrina*) has mid-green leaves boldly striped with darker green. *M. tigrina* (*Calathea tigrina*) is very similar except that the ground colour is a paler green. *M. sanderiana* has pinkish and white veins, while *M. veitchii* is another attractive variety.

### *Peperomia*

Low plants with fleshy leaves, usually prettily marked. Can be increased by division of the side shoots.

### *Saintpaulia ionantha*, or African violet

A low plant with round, hairy and fleshy leaves, bearing very pretty purplish-blue flowers. Can be propagated by striking single leaves in a sandy soil, or by division.

If the leaves are watered they are liable to rot, so water carefully under them. If grown in pots, the plants can be watered from below by standing the pots in water for five or ten minutes.

### *Strobilanthes*

Some of these plants are of dwarf growth suitable for pot work. Perhaps the best of these is *S. dyerianus*, described in the chapter on 'Shrubs and Shrubberies', which grows 2 to 3 feet high outdoors but is of more compact growth in a pot.

### Climbers and creepers for the walls or pillars of a fern-house

#### *Asparagus plumosus*

A well-known feathery foliage climber for wire walls or pillars.

## THE GARDEN IN THE PLAINS

### *Cissus discolor*

A creeper with mottled red and green leaves on red stems. Deciduous in the cold months.

### *Clerodendron*

*C. thompsonae* and *C. splendens* have been described in the chapter on 'Climbers and Creepers', and are suitable for the walls of a fernery mixed with another climber which is not deciduous in cold weather.

### *Manettia bicolor*

A climber with scarlet and yellow flowers.

### *Philodendron carderi*

A foliage creeper suitable for covering pillars.

### *Thunbergia fragrans*

This climber, described in the chapter on 'Climbers and Creepers', is suitable for wire mesh walls.

### Flowering shrubs for the fernery

The following flowering shrubs if grown in the fernery will also provide colour. They are all described in the chapter 'Shrubs and Shrubberies'. *Barleria*, *Crossandra*, *Clerodendron paniculatum*, *Eranthemum*, *Pentas carnea* and *P. alba*.

Many dwarf shrubs thrive in semi-shade and are useful for a shady outdoor fernery or for pots in the fern-house. It is a good plan to place their pots in a shady spot in the garden, bringing them into the fern-house for a day or two at a time when the flowering stage is reached. If they become debilitated after a long stay in the fernery do not subject them immediately to strong light.

Choose 10- or 12-inch pots, or halved oil drums painted green with drainage holes pierced through the bottoms. Before filling up with soil put a 2-inch layer of broken brick or potsherds with the hollow sides downwards over the holes.

Re-pot the shrubs in the early rains after having

## FERNERIES AND POT PLANTS

scrubbed the pots well. The pots should be filled to within an inch of the rim with fresh compost.

### Compost for potted shrubs

1 part well-rotted cow manure

1 part good garden soil

### Palms that can be pot grown

Most palms grow to a fair height outdoors and some grow very tall, but if pot-bound they will remain dwarfed and suitable for a fernery or veranda for some years. For details on this subject see the chapter on 'Palms, Ornamental Grasses and a few Succulents'.

## Chapter xiv

# ROCKERIES

'The charm of a rock garden is essentially Lilliputian . . . Climb, in your mind's eye, the mossy stones, and grow dizzy on their steep escarpments.'

—Beverley Nichols: *Down the Garden Path*

~~~~~  
Making a rockery—Types of rockeries—Care of rockery plants
—SUGGESTIONS FOR ROCKERY PLANTS

THE colourful rockery with true rock plants is not found on the plains of India. Many decorative rock plants cannot survive the heat, whilst in some districts rocks and stones are difficult to procure.

The Indian version of a rockery, however, can be very beautiful. Ferns and creeping herbs take the place of rock plants proper, and some colour can be introduced by foliage plants, dwarf shrubs, lilies or annual flowers. In humid places an outdoor rockery of fern-house plants is a possibility if there is shade and protection from wind. In drier parts it is necessary to have such a rock garden incorporated in the fern-house.

Making a rockery

The problem of rocks in a stoneless place may be overcome with the help of a local builder and contractor. He can perhaps provide fragments of old concrete, or will make irregular blocks of rubble and mortar. Lumps of overburnt brick are obtainable from most kilns. Concrete or brick are very poor substitutes for natural rocks, but they should not be despised entirely, for even a synthetic rockery pro-

ROCKERIES

vides a good stage for fern-house plants, and the artificiality is decreased considerably when the ferns and creepers have established themselves. The chief point to remember about both artificial and true rock is that large chunks with broad surfaces are preferable to small, symmetrical pieces.

The planning of a rockery is not as easy as one might think, for a demure, regular design is not at all effective. You must visualize a miniature mountain range, an outcrop of rock on the slope of a hill, or a mountainous coastline. There should be small bays, jutting headlands and a few dominant peaks, and in between the 'ranges' of a large rockery the 'valleys' are winding paths paved with flat stones. Before starting work, collect the necessary soil and assemble the stones nearby. You will find that you need five or six times as much earth as rock.

The first step in making a rockery is to draw the rough outline on the ground. Next, excavate the site to a depth of 6 or 9 inches, and fill this space up to ground-level with gravel or broken brick rubble and a little earth to form a firm drainage bed. This strong foundation should now be covered with a layer of earth a foot or so deep. Fairly big rocks are then arranged at ground-level with half to three-quarters of their bulk buried in the layer of soil. It is important to see that each rock rests on its broadest face, and is slightly tilted backwards and embedded in the earth. Gradually build up the rockery in this way to the desired height and shape, packing plenty of soil beneath each stone. If the rocks are stratified, that is, formed in natural layers, they should be placed so that the strata run in the same direction to avoid a chequered effect.

Try to avoid a too even, tiered appearance as you build, and keep the surface lines irregular instead

THE GARDEN IN THE PLAINS

of level. In order to avoid loss of soil in the rains or from heavy watering, the slope of the rockery must not be too steep, but should rise in irregular shelves to the climax of the peaks. Never let the rocks be overhanging, and they must be arranged boldly with broad surfaces to give the impression of a natural outcrop. At all costs avoid the effect of many small stones scattered over a heap of earth. Big pieces of concrete and overburnt brick are more difficult to arrange naturally than true rock, but when the plants have grown and the rockery is fully dressed, their artificial appearance largely disappears.

The irregular shapes of the rocks and their different elevations form pockets and clefts which will hold the plants. If a variety of plants is to be grown, ranging from ferns to dwarf shrubs, the soil in these pockets can be treated to suit each particular plant.

A little pool sunk in the rockery is very attractive, but as this must be lined with cement concrete some outside help will be required to build it. Drainage or spillway pipes from the pool will be hidden in the rockery and should continue for some distance underground so that the water can seep into the soil well away from the rockery. If the water in the pool is likely to be changed often it is better that the drainage pipe should discharge eventually into an outlet drain.

Summary

(1) Prepare a drainage bed over the site, which also makes a firm foundation for a heavy rockery.

(2) Use five or six times as much earth as rock.

(3) Choose big stones with broad surfaces.

(4) Build with earth and rock together up from ground-level.

(5) Tilt each stone slightly backwards into the soil, with half to three-quarters of its bulk buried in earth.

ROCKERIES

(6) See that the strata of natural rocks run the same way to avoid a chequered effect.

(7) Keep the general design irregular, with uneven surface lines.

(8) Build to a climax in the way of a peak or bluff, without making the slope of the rockery too steep.

Types of rockeries

A cold weather rockery of annuals

In all plains districts where bedding flowers can be grown in the cool weather, it is possible to have a very colourful rock garden with the help of annuals. Such a rock garden should have full sun and will be at its best in the cooler weather, for the stones heat up too strongly in the summer to allow flowers to thrive in most parts of India.

A rockery of succulents for dry areas

In districts where the climate is too dry to grow ferns and fern-house plants outdoors, it is sometimes possible to have an outdoor rockery of succulent plants, both large and small. Names and descriptions of suitable plants will be found in the sections 'Tall succulents' and 'Smaller succulents' in the chapter on 'Palms, Ornamental Grasses and a few Succulents'.

A rockery of big succulent plants should be boldly conceived for some of the plants grow very tall and will need a massive setting. The boulders should be as large as can be rolled into place safely. This type of rockery should have full sun.

A rockery of fern-house plants for humid areas

The site for the outdoor rockery of ferns and fern-house plants should be a shady corner well protected by evergreen trees from wind and sun, yet out of range of heavy drip from their leaves if possible. As

THE GARDEN IN THE PLAINS

this type of rockery is shaded in order to grow ferns, annual flowers requiring sun will not thrive on it.

In dry weather the outdoor rockery must be watered every evening, and possibly in the morning as well.

A rockery in the fernery

In all but humid districts, the only place for the year-round rockery of shade-loving plants is in a fern-house. Unless the fern-house is on a large scale a heavy rockery is out of place. A rocky wall to the fern-house would shut out too much light, so it is advisable to concentrate the rockery as a mountainous and irregularly shaped island towards the centre of the house.

A fern-house rockery is not very colourful, for annual flowers and many shrubs do not like gloom, but there is such a wide choice of ferns, small foliage plants and creepers, that a very cool, fairy-like effect can be achieved without relying on much bright colour.

Care of rockery plants

Early in the rains thin out any plants that have thickened unduly. *Alocasia*, *caladium*, etc., should be allowed to die down for the winter by the gradual withdrawal of water, and ought not to shoulder too closely those plants requiring regular watering all the year round. At the same time they should not be planted in such masses as to leave too large a bare patch during their dormant season.

The soil for annual plants, or for those which are divided and replanted yearly, should be forked deeply and a little compost, rotted cattle manure or leaf mould added each season, according to the type of plant grown. Dwarf shrubs and the like that are not lifted should have some sort of bulk manure forked into the earth round them each year.

ROCKERIES

Moisture drains away quickly from a well-built rockery, and a thorough watering once a day, or even twice in very hot and dry weather, is necessary for the plants in most cases, especially on outdoor rockeries. Care must be taken, however, not to wash the soil out of the pockets.

Keep the plants clean by snipping off any dead fronds or leaves, and in dry, dusty weather syringe the leaves of all foliage plants with clean water once or twice a week.

SUGGESTIONS FOR ROCKERY PLANTS

In addition to the plants listed below, many of those mentioned in the chapter on 'Ferneries and Pot Plants' are suitable for a shady rockery.

Annuals for a cold weather rockery

The following flowers should thrive on a sunny rockery.

Alyssum, *Browalia elata*, *calendula*, *candytuft*, *dianthus*, *dwarf ageratum*, *gaillardia*, *gerbera*, *Leptosiphon hybridus*, *linaria*, *nasturtium*, *Nolana grandiflora*, *petunia*, *Phlox drummondii*, *Phlox nana compacta*, *Platystemon californicus*, *portulaca*, *verbena*, *V. erinoides*, *Zinnia linearis*.

Plants for an outdoor rockery in dry districts

Descriptions of the succulents listed below will be found in the chapter on 'Palms, Ornamental Grasses, and a few Succulents'.

Agave, *aloe*, *bryophyllum*, *echeveria*, *Euphorbia bojeri*, *nopalea*, *opuntia*, *pitcairnia*, *yucca*, and so on.

Plants for a shady rockery

Colour in the rockery

Annual flowers requiring sun will not thrive on a shady rockery, and instead the following plants can be grown to give colour.

THE GARDEN IN THE PLAINS

Salvia splendens (red salvia), *S. farinacea* (blue salvia). Amaryllis lilies in terra-cotta, red and white. Crinum lilies in pink and white. Zephyranthes or crocus lilies in pink, white or yellow. Terrestrial orchids such as *Arundina bambusifolia* and *Spathoglottis plicata* are hardy enough to grow on the outdoor rockery in humid districts given a suitable compost.

Dwarf shrubs

The following shrubs can be grown on a semi-shady outdoor rockery at the base of the structure, or in deep pockets at points which require emphasis.

Barleria, *Clerodendron paniculatum*, crossandra, *eranthemum*, *Orthosiphon stamineus*, *Pentas carnea* and *P. alba*, *Iresine herbestii*, *Lantana sellowiana*.

Creeping plants

Plants marked * are described elsewhere in this book.

Fittonia, a creeping plant with variegated leaves.

Hemigraphis colorata, a creeping plant with metallic purplish-green leaves and small mauve flowers.

*Panicum variegatum**

*Pellionia**

*Pilea muscosa**, a small green herb which stands drought well.

*Philodendron carderi**

Selaginella laevigata, *S. serpens*, *S. argentea*, are beautiful close-growing plants that clothe the bare rocks quickly. They must have shade and moisture.

Tradescantia zebrina (*Zebrina pendula*)*

Small plants

*Achimenes**

Billbergia, plants with succulent leaves and spikes of pink or purple flowers.

Cyanotis barbata, a plant with blue flowers appearing in the rains. It likes a shallow pocket with gravelly soil.

*Alocasia**, for a rockery under cover.

*Anthurium**, also suitable for a rockery under cover.

*Apluda aristata**, a small grass.

*Coleus**

*Cyperus alternifolius**, a sedge or rush which will grow in a fairly deep cleft.

ROCKERIES

*Gynura aurantiaca**

*Iresine**

*Maranta**

*Peperomia**

Sansevieria, or Bow String Hemp. *S. zeylanica* has sword-like leaves about 25 inches long, coloured green and transversely blotched with grey, which give point to the rockery. *S. guineensis* is a much taller variety, about 3 to 4 feet high.

Schizmatoglottis, a dwarf plant with lanceolate leaves in various colours and next to no stems.

Tradescantia discolor (*Rhoeo discolor*), a small plant 12 to 18 inches high the leaves of which have purple edges and undersurfaces.

Ferns

Many of the hardy ferns mentioned in the chapter on 'Ferneries and Pot Plants' will grow outdoors in humid districts given shade, moisture and protection from wind, but all delicate types must be under cover.

Ferns look attractive set in a cleft of a shady rockery, but there must be a suitable compost in the pocket.

Chapter xv

WATER GARDENS AND MARSHY GROUND

‘Comforting, that crisp, gentle sound of water ;
ever so comforting to sit on a stone, very still,
and wait for things to happen round you.’

John Galsworthy : *The Dark Flower*

~~~~~  
Mosquitoes—Fish for a pond—The ideal water garden and a compromise—Formal treatment of a ‘tank’—Landscape effects—Aquatic plants—Planting water lilies—A paved pool—Stocking a pool—Marshy ground—The seaside garden—A LIST OF PLANTS

**I**N India people are often afraid of making a water garden because it may breed mosquitoes. It would be unwise, perhaps, to make a pool in a notoriously malarious district, but in many places there is no undue risk provided certain precautions are taken.

### Mosquitoes

In dealing with water gardens in India the question of mosquitoes must, of course, be considered. The curious ways of this pest are not wholly understood yet, and some streams and *nullahs* harbour varieties which are carriers of malaria, whilst others are comparatively free. The same holds with ponds. Mosquitoes may be kept in check by treating the water with oil which forms a film on the surface and suffocates the young insect wriggler, but plants will not thrive in an oily medium and such treatment rules out aquatic planting. There are several varieties of

[ 224 ]

### WATER GARDENS AND MARSHY GROUND

small fish that eat the larvae of mosquitoes, and it is worth while trying to procure some of these to keep a water garden clear of this pest.

In some places a small fish known as Million’s (*Lebistes reticulatus*) is procurable, which eats the larvae of mosquitoes. In other districts fish such as *Aplocheilichthys* and *Panchax* serve the same purpose, the latter being brightly coloured and ornamental as well as useful. Being indigenous it is hardy and does not need the care and attention necessary for imported exotic species.

### Fish for a pond

Do not overstock a pool with fish, for they need plenty of oxygen and space if they are to thrive. A few large-leaved aquatic plants are necessary to fish as a shelter or protection from hungry kingfishers, and one or two rounded boulders placed on the floor of the pond provide additional cover.

Owing to the extreme variations in temperature often experienced it is as well to have a full 18 inches of soil on the floor of a paved pool if fish are to be kept.

Fish prefer natural food, the fry of snails, the larvae of midges and flies. These foods will be found already established in streams or old ponds, and in artificial pools once aquatic plants have established themselves. A lot of prepared fish food is liable to foul a pond and encourage fungi, and should not be necessary except possibly for a short time when fish are introduced into a new pool. Fine oatmeal, previously steeped in hot water, can then be used, and there are made-up fish foods on the market.

Aquatic snails such as *Planorbis*, or the large pond snail *Ampullaria*, help to keep algae<sup>1</sup> in check and

<sup>1</sup> Algae are low forms of plant life which often form a scum on the surface of water.

[ 225 ]

#### THE GARDEN IN THE PLAINS

do good work in disposing of drowned worms and other animal matter. They can be found in any pond or ditch overgrown with weeds, more especially near streams and lakes. Water fleas (*Daphnia*) live mainly on algae and so help to keep the water clear. They multiply quickly enough to keep their numbers up and provide food for the fish as well.

There are various submerged water weeds procurable that help considerably in aerating water and keeping it pure. These are found in natural waterways and it is advisable to get a few plants for an artificial pool. The names of some of these weeds will be found in the lists at the end of this chapter.

Detailed information on keeping fish can be had from the Departments of Fisheries.

#### The ideal water garden and a compromise

A winding stream falling to a lower level in a series of cascades and little pools, or a small lake set in a natural hollow, make the ideal setting for a water garden, but on the plains of India if one is lucky enough to have water in a private garden it is usually in a square or oblong 'tank', with the excavated earth heaped round the sides. Such a tank seems difficult material to work upon, but it can be made into a beautiful feature of the garden.

There are roughly two ways of transforming a tank, one may be called formal, the other natural. The formal treatment does not attempt to modify or soften rectangular lines, and the water is used as a mirror for massed flowers on the banks. The tank as a feature can be emphasized by a well-defined approach, such as a paved path flanked with flower borders, a pergola, or a flight of steps to the water with a couple of vases on pedestals guarding the descent. A natural water garden reproduces a wild, forest-bound

#### WATER GARDENS AND MARSHY GROUND

lake in miniature. Overhanging vegetation dresses the banks, and interest is drawn to the water itself.

#### Formal treatment of a 'tank'

Formal treatments are particularly suitable for the tank in a small garden especially if it is near the bungalow. The water itself is free of plants and accordingly can be treated against mosquitoes if necessary.

The simplest scheme is to run a low railing about 2 feet high round the tank, and allow flowering climbers to ramble along it and over an arch at the top of a flight of brick steps that leads to the water.

If the tank is not too large to work upon easily, a spectacular effect can be obtained by cutting back the banks to a gentle slope, and terracing them in irregular bays down to within a few feet above water level, planting the terraces with masses of cannas in every shade from pale apricot to flaming scarlet. It must be remembered that although cannas like water they do not like water-logging. In the rains the water-level may rise several feet, and this fact should be borne in mind when cutting the lower terraces for the flowers. A few narrow paths or steps winding down the terraces, paved with stone or brick, are a help when tending the plants.

To be effective the terraces should not be too sharply stepped, 18 inches between each level being a suitable height. The retention of terraces is always a problem. If you do not want the expense and trouble of supporting each with stone or brick-work, allow grass to grow up the terrace face. Bamboo stakes are a help in keeping clods of grass in place until they become part of the bank.

If possible the heaped earth round the edge of the tank should be flattened to allow of a formal approach. The charm of this treatment is the bowl of

## THE GARDEN IN THE PLAINS

glowing colour formed by the flowers on the banks and their reflection in the water.

### Landscape effects

Natural treatment of a tank is more ambitious than the formal scheme outlined above. It is essential to break the hard outlines, and if it is not possible to alter the actual shape of the tank, a good method is to vary the height and spread of the plants grown along the banks. In aiming at a landscape effect the following ideas may prove helpful.

Along the top of the far bank plant one or two bougainvilleas, and encourage some of the sprays to lean over for reflection in the water, while others are trained to ramble along the banks. One of the smaller varieties of bamboo, a quick-growing flowering tree, one or two shrubs, or clumps of tall grasses, are all useful in providing the high points needed near the banks.

Lilies, hardy ferns, creeping herbs, or a rush, like *Cyperus alternifolius*, all lend variety in fairly moist districts, and can be planted in pockets cut in the banks almost down to the monsoon water level. The ferns will appreciate shade from any overhanging vegetation.

If possible the near bank should be carved down to a very gentle slope so that the water can be seen from a distance. Plant this comparatively low bank with tall, feathery grasses and lilies, with marsh-loving plants near the water's edge. Lilies look particularly attractive grown in the grass by a pool provided there is no chance of their roots standing in wet soil. (See the sub-section on 'Lilies grown in drifts on grass' in the chapter on 'Lily Bulbs and Tubers'.)

A big pot submerged a few inches in water close to the shore can house *Cyperus papyrus*, the

## WATER GARDENS AND MARSHY GROUND

paper-grass of Egypt, which will grow with its roots just under water. Should the tank be shallow and if there are any large boulders available, group a few in the water close together to form an island, with bulrushes growing in crevices between the boulders. Masses of rubble and cement mortar can sometimes take the place of boulders, provided the clefts are planted thickly so as to mask the artificiality. A few water plants will complete the landscape effect.

If the tank is the source of your drinking water, both aquatic planting and anti-mosquito treatments are ruled out, of course. You will have to be careful also how you plant the banks, as fallen and rotting leaves are not desirable and it is as well to have full sun on the water.

### Aquatic plants

In the water itself, the *Nymphaea* or water lily group is the most desirable aquatic for the average garden pool. There are some floating water weeds which are pretty enough to be worth growing (see lists at the end of the chapter), although these often require severe control if they are to be prevented from choking a pool. A certain amount of clear water is essential for the beauty of reflections and for proper aeration, so do not let water plants get a stranglehold.

The submerged water weeds are very helpful in oxygenating the water and keeping it pure, and a few should be procured for an artificial pool if possible.

### Planting water lilies

Water lily plants or crowns can be bought from the various Horticultural Gardens, but it is a fairly easy if somewhat lengthy process to grow them from seed. The seeds are sometimes put into balls of clay

## THE GARDEN IN THE PLAINS

and thrown into the pool or tank, but a better method is as follows.

### *Water lilies from seed*

Procure an earthenware *gumlah* and fill it with clay soil to within  $\frac{3}{4}$  of an inch of the rim. Sow about three water lily seeds, well spaced, put the pot in a slightly larger and deeper vessel, and fill up with water to the brim. As the water evaporates add more to keep the water line steady.

Germination may take as long as 4 to 6 months, or even longer. When the little plants are just under 1 inch high (perhaps in the 7th or 8th month), transfer the *gumlah* to the pool and support it just under water on a pile of bricks. As the plants grow, remove the bricks of the support in stages so that the pot is lowered gradually until it eventually rests on the floor of the pool.

Leave the pot resting at the bottom for a week, then let out some of the water from the pool by syphoning or other means, so that the lilies can be attended to easily. Take up the pot, and very carefully lift each lily plant with a ball of earth round the roots, and plant it in its permanent place, singly in a wide earthenware pot, or on the floor of the pool. Weight the plants so that the roots do not float before they are established. Let in water slowly until it has reached its former level.

### *Planting water lily crowns*

Bought or collected water lily crowns should be placed singly in broad earthenware pots or *gumlahs* filled with a special compost (described later). Any holes at the bottom of the pot should be plugged with cement mortar so that the soil is not washed out.

Take the pots to the pool and support each one on a pile of bricks so that the leaves of the plants are submerged 3 inches below water level. When

## WATER GARDENS AND MARSHY GROUND

the plants have grown so that the leaves have reached the surface of the water, remove a few bricks at a time from beneath the pots so that they are lowered gradually, according to the growth of the plants, until they rest at the bottom of the pool. The pots may then be embedded in the soil on the floor of the pool, or else broken up and the lilies planted together with the earth from the pots. Weight the newly planted lilies, as mentioned above. The pool should be nearly empty while the planting process is taking place, otherwise it is difficult to carry out the job properly. Afterwards let in the water again slowly.

### *Water lilies planted in deep tanks*

In big tanks where the water is deeper than 2 or  $1\frac{1}{2}$  feet and the water level cannot be lowered, it is not easy to plant the lilies in the soil at the bottom of the tank. Instead put the water lily crowns singly in light woven grass baskets about 12 inches square, with strong handles. These baskets can be supported by their handles at the end of a rope attached to a strong rod stuck firmly into the bank, and lowered by gradual stages to the floor of the tank by lengthening the rope. Once the baskets are resting on the earth bottom, cut the rope as far down as possible and leave the baskets where they have settled. If the material of the baskets is thin enough, it will rot quickly and the roots of the plants will find their way to the earth beneath.

The use of baskets instead of earthenware pots is not advisable in small pools as the rotting material is liable to introduce fungus disease, but in deep water it is the better alternative.

### *Compost for water lilies*

- 7 parts ordinary garden soil
- 1 part well-decayed horse manure
- 1 oz. superphosphate to every bushel of soil (roughly
- 1 oz. to every two heaped baskets of soil).

## THE GARDEN IN THE PLAINS

The stronger growing water lilies will have to be divided from time to time, those confined in pots requiring division when the root growths fill the pots.

### A paved pool

A paved pool can be a most decorative feature in a garden. The shape should be simple, its position definitely important in the garden scheme, and the site open and free from falling leaves. Chinks can be left in the paving or the design can be such that it is easy to grow plants round the pool informally.

The exposed rim of the pool looks best if it is from 18 inches to 2 or 3 feet wide. The materials used for the rims are generally stone, bricks, or blocks of concrete paving. The inside of the pool should be a concrete layer 4 or 5 inches thick covered with a lining of cement mortar strengthened at the corners where leakage gradually occurs. Add Pudlow water-proofing powder to the cement, 1 lb powder to 20 lbs cement. (See 'Concrete for general use' in the chapter on 'The Formal Garden and Garden Ornaments'.)

The pool should have some sort of spill, e.g. a hole a few inches below the rim of the wall, with a sunk pipe leading through the soil to a seepage or ordinary outlet drain to take any overflow when the water level rises in the rains. The hole must be protected by fine wire netting to prevent fish escaping.

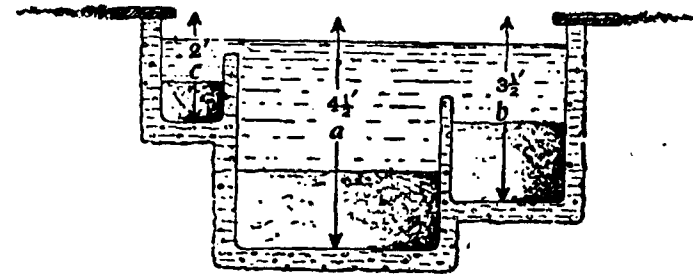
### Depth of a paved pool

When calculating how deep a pool is to be, the depth of water needed for the aquatic plants should be taken into account, as well as the depth of the soil to be laid on the floor of the pool. Another point to be considered is the question of the water level rising in the rains, and where the rainfall is heavy a margin of 5 or 6 inches should be allowed between

## WATER GARDENS AND MARSHY GROUND

the ordinary water level and the rim of the pool, in addition to a spillway pipe inserted near the rim.

Water lilies need from 18 inches to 3 feet of water, above earth level in a pool, according to their type. Allowing for 18 inches of soil, the minimum depth for a lily pool should be 3 feet, with an additional 6-inch margin. A pool to hold lilies that require 2½



Width of pool, 8'. Excavated depth at deepest point, 4' 11". Thickness of concrete walls and floor, 5".

- |                                                          |            |
|----------------------------------------------------------|------------|
| (a) 18" soil<br>30" water<br>6" margin above water level | } 4½' deep |
| (b) 18" soil<br>18" water<br>6" margin above water level |            |
| (c) 9" soil<br>9" water<br>6" margin above water level   |            |

FIG. 19. SECTION THROUGH A PAVED POOL, CONSTRUCTED TO HOLD PLANTS REQUIRING THREE DIFFERENT DEPTHS OF WATER

or 3 feet of water should be between 4 and 5 feet deep. Some aquatic weeds will thrive in a foot or less of water, so the depth of the pool where they are to be can be comparatively shallow.

If plants requiring different depths of water are to be grown in the same pool, make the centre deep

#### THE GARDEN IN THE PLAIN

enough to hold the water lilies, according to their type, and step the sides to form protruding shelves or ledges of the necessary depths, to house those aquatic plants needing less water. Each of these ledges should have a thin concrete wall, submerged below the water on the outer side, so that the soil on the ledge is not washed off (see Fig. 19). An alternative to stepping the sides of the pool is to grow each plant in a wide pot, supported by bricks at the required depth.

##### *Seasoning a paved pool*

Before laying down the soil and stocking the pool, fill it with water and leave for about 15 days; then empty the pool and scrub the concrete with clean water. Repeat this process once more, and empty the pool again before putting in the soil and water. Allow the earth to settle before stocking a new pool with aquatic plants or fish.

##### *Changing the water of a pool*

It should not be necessary to change the water in a pool if suitable submerged aquatic weeds are grown for aeration, and the water is not polluted by too much prepared fish food or by overstocking with fish. Take care to keep the pool clear of rotting vegetation, dead frogs and the like.

In case it should ever be necessary to change the water or to reduce the water level, it is a good plan to have a sunk drain pipe in the wall 7 inches above earth level in the pool, fitted with a firm plug. A circle of fine wire netting must be fitted behind the plug so that when the water flows fish are prevented from escaping.

Another method of taking out water is to syphon it away by filling a piece of light rubber hose with water, and closing its ends by squeezing them or other

#### WATER GARDENS AND MARSHY GROUND

means. One end of the full hose is placed in the pool, and the other outside, below the level of the water in the pool, into a drain perhaps. Unstop both ends of the hose and the water drains off. Take care that no tiny fish are removed by way of the pipe.

Whether draining or syphoning off water from a pool, it is important to leave 6 inches of water at the bottom over the soil so that fish are not left high and dry. A certain amount of old water mixed with the new does not matter. Put in the fresh water at once, taking care that it is about the same temperature as that taken out, and letting it in slowly and gently.

##### **Stocking a pool**

Always see that half the water surface is kept clear of aquatic leaves and flowers, so that the plants get all the oxygen they require. Water lilies spread their leaves for a distance of 2 to 4 or 5 feet, so do not grow too many in a small pool. Lilies such as the lotus are best confined to tanks.

A pool 12×8 feet, with 2 to 3 feet of water above earth level at the deepest point, can be stocked as follows.

- 2 water lilies
- 1 water fern, or 1 decorative floating weed kept well under control
- 1 or 2 submerged weeds for aeration
- 25 pairs small fish, such as Millions or *Panchax*
- 40 water snails

(See the section on 'Fish for a pond'.)

##### **Marshy ground**

Many old bungalows with gardens on river banks have some marshy and neglected corners. A small patch of swampy ground can usually be filled up with soil, level with surrounding higher land. If the low-

#### THE GARDEN IN THE PLAINS

lying area is at all big, however, it should be carefully drained, as a swamp is most unhealthy near a dwelling.

If the swamp is at the bottom of a slope it should be protected from water coming in from above by means of cross drains leading to sloped outlet drains. (See the section on 'Drainage' in the chapter on 'Soil and Manuring'.) The land between the drainage channels should be well dug and limed at the rate of 5 ounces of powdered limestone per square yard, and perhaps planted with moisture-loving trees or other plants.

#### The seaside garden

The seaside gardener usually has to contend with two main difficulties, a poor soil and strong winds. The question of soil varies with the locality. In some places laterite is the problem, in others a sandy soil. Red lateritic soil is often very hard, and sometimes gardeners have to cut extra big pits for the plants and mix the soil with manure and friable earth imported from further inland. Sandy soils need constant building up with some crushed limestone and plenty of organic manure, as is described in the section 'Soil management' in Chapter III. It is not possible to do much with gardens within reach of actual sea spray, but ordinarily a garden can be protected from gales by growing a tall hedge or windbreak on the side where the prevailing winds blow. The tree *Casuarina equisetifolia* can be grown to form a dense hedge, and is controllable for a number of years.

If an effort is made to build up the soil and provide protection from wind, it is possible to grow a number of the hardier ornamental plants a short distance from the shore. They must be chosen to suit the climate, of course. Flowering trees like *Peltophorum ferrugineum*, the Gold Mohur (*Poinciana regia*), and *Spathodea campanulata* are often seen. Shrubs like datura,

#### WATER GARDENS AND MARSHY GROUND

*Caesalpinia pulcherrima*, hibiscus, oleander, plumeria and crotons, or bright climbers like the bougainvillea, *Quisqualis indica* and some of the *Ipomoeas* are to be found in many seaside gardens. Near the beach the selection narrows, while a few sand-binding plants are all that will grow by the edge of the sea. At the end of this chapter there is a list of seashore plants.

#### A LIST OF PLANTS

##### Plants for the banks of a 'tank'

##### Bamboos

The smaller kinds, such as *Bambusa aurea* or the dwarf *B. nana*, are useful grown near a tank treated in the landscape manner, where the climate is suitable.

##### Cannas

Cannas are effective for a formal treatment of a tank, when the vivid colours look lovely reflected in the water. (See the chapter on 'Cannas'.)

##### Ferns

A few hardy ferns can grow on the banks of a natural water garden or on the rim of a paved pool. *Asplenium nidus-avis* is a handsome fern with large fronds, the *Nephrolepis* family are hardy and will grow in most situations bar full sun. *Gymnogramme chrysophylla*, the gold fern, stands sun well.

##### Flowering grasses

Tall grasses give an attractively wild look to the banks of a natural water garden. Those described in the section on 'Tall grasses' in the chapter on 'Palms, Ornamental Grasses and a few Succulents' are suitable.

##### Lilies

These can be planted in pockets on the banks of a natural water garden, on the rim of a paved pool, or in drifts on grass near water. *Pancratium longifolium* (the spider lily), varieties of crinum, and the hardy amaryllis or *Hippeastrum* are all useful. Zephyranthes or crocus lilies in yellow, white and pink, look very pretty grown in drifts on a gently sloping grass bank near water. In some moist

## THE GARDEN IN THE PLAINS

districts *Iris chinensis* with blue flowers, and *I. moracoides* with white flowers, will grow. (See the chapter on 'Lily Bulbs and Tubers'.)

### Shrubs and shrubby climbers

Shrubs of different heights lend variety to the banks. (See the chapter on 'Shrubs and Shrubberies'.) They can be grown on a bank quite close to a pond provided there is no chance of their roots standing in water or soggy soil. Many climbers are effective if pruned to shrub form or trained to ramble among the banks, e.g. *Allamanda schottii*, bougainvilleas, *Bignonia magnifica*, and so on. (See the chapter on 'Climbers and Creepers'.)

### Trees

Trees always look attractive near water, but they should be planted far enough from the banks to give scope to the roots, and to prevent fallen leaves fouling the tank.

Trees with a spreading or weeping habit make a good background for a tank or pond. *Cassia nodosa*, the pink mohur, *Poinciana regia*, the gold mohur, are striking trees with a good spread, while the weeping callistemon or bottle-brush tree, and the weeping willow (*Salix*) are graceful. The latter is particularly useful as it thrives quite near water.

### Plants for marshy ground

#### Palms and allied plants

Several palms and similar plants will thrive in low-lying areas. *Nipa fruticans*, the water palm, likes true marshy ground. Others are *Areca lutescens*, *Rhapis flabelliformis*, *Carludovica palmata*, *Cyclanthus cristatus*. Varieties of screw pine (*Pandanus*) will thrive on marshy ground and thicken rapidly.

#### Rushes

Rushes are usually half-and-half plants that will grow on the rim of a pool or in the water with their roots just submerged. *Typha angustifolia* is a tall bulrush with cylindrical, dense brown heads, and *T. elephantina* is a larger type only suitable for a big expanse of water. *Cyperus alternifolius* is useful for planting on the rim of a pool, while *C. papyrus* will grow with its roots just under water.

## WATER GARDENS AND MARSHY GROUND

### Small plants

*Acanthus ilicifolius* is a low shrub with prickly leaves and blue flowers. *Acorus calamus*, the sweet flag, grows in swampy ground. *Commelina sellowiana* is a plant with blue flowers that likes partial shade and grows well near water. *Hedychium coronarium* has fleshy stems and grows about 3 feet high, with white scented flowers appearing in the rains. There is also a variety with creamy-yellow flowers. *Costus speciosus* has reddish-white or mauve flower-heads borne in the rains. *Marsilea quadrifolia* is a small fern which grows in swampy soil.

### Trees

Several trees will grow well in low-lying areas provided the soil is not sour with stagnant water: notably *Barringtonia speciosa*, *B. racemosa*, *Lagerstroemia flos reginae*, and *Salix*.

### Aquatics

#### Water Lilies

*Nymphaea sulphurea* and *N. lutea* are yellow water lilies, and will thrive in 2 or 2½ feet of water. *N. rubra* (*N. lotus*) has red flowers, while *N. pubescens* has white flowers appearing in the cold weather. *N. stellata* has bluish flowers borne in the monsoon only, and will thrive in 18 inches of water. This spreads rampantly unless controlled.

The *Marliacea* hybrids have beautiful flowers, and one or two varieties are said to do well in some parts of India. They need from 2 to 3 feet of water.

*Nelumbium speciosum*, the sacred lotus, has large double pink or white flowers and leaves which stand up away from water. It requires from 3 to 4 feet of water, and is best grown in a tank.

*Victoria regia* has magnificent round tray-like leaves, several feet across, and pink or cream flowers, but it is only suitable for a big tank with about 4 feet of water. This is an annual water lily seldom cultivated by the amateur as the seeds are difficult to germinate.

#### Water weeds, ornamental or useful for aerating purposes

*Aponogeton distachyum*, the water ribbon weed, has white

#### THE GARDEN IN THE PLAINS

or pale blue flowers. It needs from 1½ to 2 feet of water, and is suitable for the cooler districts.

*Azolla pinnata* is a feathery weed which gives a reddish tone to the pool, but needs severe control.

*Ceratopteris thalictroides*, the water fern, is a pretty aquatic fern needing about 2 feet of water.

*Ceratophyllum verticillatum* is a feathery submerged weed often used for aerating the water of an artificial pool or in aquaria. This needs severe control as it spreads rapidly.

*Eichornia* (*Pontaderia crassipes*), the water hyacinth, has blue flowers and fleshy leaves. It is very beautiful, but spreads rapidly enough to choke a tank unless controlled with constant care and severity. In Ceylon this weed is banned and in India very much discouraged.

*Euryale ferox* is an aquatic with floating leaves and curious upright spines, and pale mauve flowers.

*Limnathemum indicum* has leaves very like those of a water lily, and tiny cream flowers. The plant is suitable for a small pool if it is controlled. Will grow in either 1 or 2 feet of water, and is useful for the shallow parts of a pool.

*Monochoria hastata* has blue flowers and much resembles the water hyacinth both as to good looks and bad habits, but is somewhat taller.

*Ottelia alismoides* has small whitish flowers, and needs shallow water to thrive best, say from 9 to 12 inches.

*Pistia stratiotes*, the water lettuce, is an ornamental plant with leaves like rosettes or tiny cabbages. It likes still water sheltered from wind, and spreads rapidly if not controlled.

*Sagittaria sagittifolia*, or arrow-head plant, has white flowers and pointed leaves. This likes really shallow water or marshy ground.

*Trapa bispinosa* is an aquatic plant with pretty bronze-green foliage and edible nuts. Useful for the shallow parts of a pool.

*Utricularia*, or bladder wort, is a curious weed with a number of small bladders. Useful for the shallow parts of a pool.

*Vallisneria spiralis*, or water tape grass, is a weed with long submerged leaves, the length of which varies according to the depth of water. One of the most commonly used plants for aerating the water of an artificial pool.

[ 240 ]

#### WATER GARDENS AND MARSHY GROUND

##### Plants that will grow near the seashore

##### Trees and shrubs

In addition to the hardier ornamental trees that will thrive a short distance inland, the following are often found near the seashore. *Barringtonia speciosa*, sometimes seen in South India; *Borassus flabellifer*, the palmyra palm; *Casuarina equisetifolia*, or beefwood tree; *Cocos nucifera*, the coconut palm; *Ochrosia borbonica*, a handsome tree with big leaves; *Thespesia populnea*, with yellow flowers.

Many hardy flowering or foliage shrubs, suited to the climate of the district, will grow a short way from the shore. Nearer the beach varieties of *pandanus* (screw pine) and tall grasses like *Arundo donax variegata* are seen. Small plants like *Vinca rosea* with white or pink flowers; *Ternera elegans*, with cream flowers; and *Ternera ulmifolia*, a dwarf shrub 2 or 3 feet high with yellow flowers, are useful as they will grow in very poor, sandy soil.

##### Sand-binding plants

*Calotropis gigantea* is a shrub with fleshy leaves and mauve-pink flowers.

*Canavalia obtusifolia*, a creeping plant, has white or pink flowers.

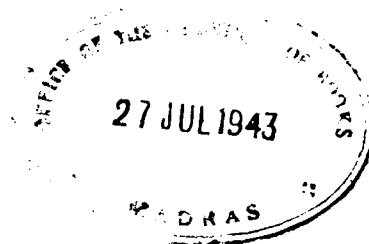
*Cassia auriculata*, often found on dry salt land, is a tall shrub with yellow flowers.

*Ipomoea biloba* is a creeping plant with two-lobed leaves and pink flowers.

*Tamarix gallica* and *T. dioica* are shrubs with slender feathery branches, and are seen on dry salt land, and on sandy beaches.

*Tephrosia purpurea* is a small leguminous shrub a foot or so high, and has purplish-pink flowers.

[ 241 ]



PART FOUR



FLOWERS



## THE ANNUAL FLOWER GARDEN

'One was a spire of blue, one was a cluster of orange, there was an orchestra of red trumpets, a mist of starry grey, and bits of sky caught in a web of green.'

—E. F. Benson

Flower borders and beds—Preparing flower beds—Sowing seed—Flowers out in beds—Cold weather annuals—Everlasting flowers—Hot weather annuals—Annuals for districts with no marked cold weather—Annuals suitable for pot work—A few perennials

**P**LANNING the annual flower garden is one of the joys of an Indian year. English flowers can be grown in places which have a cool season, and seedsmen's catalogues are nowadays particularly tempting.

A flower garden should have full sun all day, although shade thrown from the house in the late afternoon is not harmful. There should be no big trees nearby on account of their shade and competitive roots.

### Flower borders and beds

A true 'herbaceous' border is not possible at low elevations in India as only a few perennials will thrive on the plains, but a very good substitute is a border of mixed annual flowers. To achieve a colourful display a certain amount of skill and experience is needed, for it is not easy to time the planting of the flowers so that they all bloom together, the erratic germination of seeds being an upsetting factor.

Plant the flowers in irregularly shaped blocks of

## THE GARDEN IN THE PLAINS

about 10 to 18 plants, according to their spread and the width of the border. Arrange the groups so that they merge into one another unevenly, avoiding straight lines. Keep tall, straight flowers towards the back but let a few of the bushier tall flowers be a little more forward to break a monotony of line. In the same way a few flowers of medium tallness should be rather more forward than others of the same height. This uneven planting avoids a too graded effect. Let the low, spreading flowers of the foreground fall on to the grass of the lawn in a spontaneous manner.

A long herbaceous border may be as broad as 10 feet or more. Such a wide bed is rather expensive to fill with annual flowers, but a border of mixed flowers narrower than 6 or 7 feet is apt to look meagre. A straight border suits some lay-outs, but in many cases a few bold curves are more effective.

A wide mixed border with tall flowers at the back looks most effective against a wall or tall dark hedge. The bed should not be too close to this background, however, because of shade or root competition, and the space between depends largely on the height of the wall or hedge. About 5 feet is necessary between a 6-foot hedge and a flower bed. A strip of grass between a border and a path provides a soft green setting for the flowers, and at its narrowest should be wide enough to be cut easily by a lawn-mower.

Although few flowers actually clash out of doors, brilliant colours badly placed in a border are apt to kill the more tender shades. Some contrast is essential, but speaking generally, it is as well to harmonize the pastel tints, and progress through the intermediate tones to a climax of strong rich colour. Yellow is an important ingredient in a border, giving

lightness and binding the blues, reds and pinks together.

Narrow 'ribbon' borders are popular with some people, the flowers being graded in lines according to their height, with small edging plants in the front ranks.

Many flowers are particularly suited to massing in beds of one colour and kind of flower. A group of beds, each bed planted with antirrhinums in a different colour so that the shades merge into a harmonious whole, is effective. *Phlox drummondii* is another flower especially suited to group planting. Blue flowers alone look rather dull, and need the contrast of white or pale yellow nearby to show them up.

## Preparing flower beds

Beds should be simple in outline, for complicated designs are difficult to keep tidy and are unrestful to look at. Do not cut them too small, for the effect is then thin and spotty. When planning beds in groups see that there are at least 2½ or 3 feet of grass between each bed, to simplify mowing. Beds look better if raised a few inches above ground level to form a stage for the flowers; but they must not be too high or the moisture in the soil tends to dry out. Before cutting a new bed, outline the site with string attached pegs at the corners, to get a neat, straight edge.

Flower borders and beds should be dug 18 inches deep in August and a layer of rotted cattle manure or compost mixed throughout the dug soil. Every third year or so a sprinkling of lime can be forked into the earth during July, a month before the beds are manured, in districts where the rainfall is heavy or lime naturally short. Never add the lime and the manure together. When the time comes to plant out

## THE GARDEN IN THE PLAINS

seedlings dig the beds again, crumbling the top-soil finely and evenly.

### Sowing seed

For particulars regarding the preparation of seed-boxes and nursery beds, collecting seed, sowing seed, germination, the care of seedlings and so on, see the small sections in the chapter on 'Plant Propagation'. Acclimatized seeds from sunflower, cosmos, hollyhock, cornflower, larkspur, nasturtium and poppy do well, but as a rule it is better to buy fresh seeds each year.

It is advisable to sow the majority of flower seeds in boxes or protected nursery beds, but some seedlings are better not transplanted. Examples of flowers that should be sown outside direct are sweet pea, nasturtium, poppy, cosmos, coreopsis, portulaca, cornflower, nicotiana, eschscholtzia, mignonette and larkspur. With great care most of these can be transplanted on occasion, but the losses are sometimes great.

Seeds for flowers to bloom in the cool season may be sown from late August to the middle of October. August and September sowing is often risky as the seedlings sometimes damp off in the warm and humid air, so generally speaking early October is the safest time for sowing in many places. Acclimatized seeds can be sown a little earlier than imported seeds as the seedlings are not so likely to damp off. Plants from acclimatized seeds, however, are apt to mature more quickly than those from newly imported seeds, and this fact should be remembered when sowing for mixed flower borders. Seeds that are to be broadcast direct in the open beds should not be sown before October on account of possible heavy late monsoon showers. November is usually too late to sow seeds for cold season flowers, except in the case of those that bloom 6 or 7 weeks after sowing.

## THE ANNUAL FLOWER GARDEN

For hot weather flowering, sow from December to the end of January. For rains flowering, sow in April or early May.

### Flowers out in beds

For notes on transplanting to the flower beds see the section 'Transplanting' in the chapter on 'Plant Propagation'.

Seedlings that show signs of flowering prematurely should have the buds nipped off. This early flowering may be due to climatic conditions, to poor soil, to undue shock when the seedling is transplanted, or to the seedling being allowed to languish too long in a shallow seed box. Pinching back the leader shoot of a plant when it is 6 or 7 inches high encourages side branching, and results in a bushier form. Selective dis-budding makes for bigger flowers. The removal of dead flowers delays seed formation.

Tall-growing flowers are better for being staked when 9 or 10 inches high. Pieces of fine bamboo are suitable for the purpose, and raffia or split plantain fibre for binding.

It is advisable to fork the surface of a flower bed fairly frequently, but care must be taken not to damage the upper roots of the plants in the process.

Cold season flowers are at their best from January to March in most plains districts, but it is sometimes difficult to spare enough water daily for all the beds in that rather dry season. In that case it is a good plan to spread a layer of leaf mould one inch deep over the forked earth in the bed, and leave it there without further forking. This covering forms a substantial mulch which enables the flowers to thrive on one really thorough watering every second, third or even fourth day.

In districts where frosts occur it is possible that seedlings and small plants may be damaged. The

## THE GARDEN IN THE PLAINS

ravages of frost are due largely to the hot sun thawing too quickly the tiny ice particles formed within the leaves, and so damaging the tissues of the plant. If thawing takes place gradually the plants are not so likely to suffer. A good way to protect the seedlings is to cover them at night with short, leafy branches stuck firmly into the earth at a slant between each plant. This protection should not be removed until the sun has been up one or two hours and the air is warmer. An alternative to shading is to water the plants very early before the sun is up.

### Cold weather annuals

Most cold season flowers sown in late September or early October will come into bloom from January to early March. Those flowers that bloom from 6 to 8 weeks after the time of sowing may flower in December if the seed is put down towards the beginning of October and the winter is not too severe, for cold is apt to retard flowering.

#### *Ageratum*

Blue-mauve flowers. The tall variety grows about 18 inches high and is useful grown in groups in a mixed border. Plant 12 inches apart. The dwarf types grow about 9 inches high, and the miniature kind 4 inches. These last two types need transplanting several times before the final planting out, in order to keep them dwarfed. Properly grown they are useful edging plants.

#### *Alyssum*, or Sweet Alison

Has fragrant white flowers resembling candytuft. Height 9 inches, but the dwarf types grow 4 or 5 inches high only. Used mainly as an edging plant, but will grow in the chinks between crazy paving if temperatures are not too extreme.

#### *Antirrhinum*, or Snapdragon

There are three types of antirrhinum: the tall, growing about 3 feet high; the intermediate, about 18 inches high; and the dwarf, 9 inches high. The intermediate is generally

## THE ANNUAL FLOWER GARDEN

the most successful on the plains. Soil, light and rich. Sow as early as possible in seed boxes and transplant to beds, 12 inches apart. Colours: white, yellow, orange, pink and red, both definite shades and soft intermediate tones. Pinch back leaders to get bushy plants.

*Arctotis*. See 'Hot weather annuals'.

*Aster*. See 'Annuals suitable for pot work'.

#### *Bartonia aurea*

Big yellow flowers, and a showy bedding plant. Height 18 inches. In a mixed border plant in groups, each plant 12 inches from the next.

#### *Bellis perennis*, or Daisy

Useful edging plants for ribbon borders. Sow in seed boxes and transplant to the beds 6 inches apart.

#### *Brachycome*, or Swan River Daisy

Pale blue and white daisy-like flowers. Grows 9 or 10 inches high, and should be planted 12 inches apart.

#### *Browallia elata*

A pretty little deep blue flower, with glossy green leaves. The white flowering type is not so pretty as the blue. Transplant to 9 inches apart. Pinch back the leaders to make the plants bushy. Useful as an edging plant and for the cold weather rockery.

*Calendula*. See 'Annuals suitable for pot work'.

#### *Candytuft*

Very useful bedding plant. Colours: white, pale pink or mauve. The white and mauve types are generally more satisfactory than the pink. Height 12 inches. There is a dwarf type used as an edging plant that only grows 6 inches high. Seeds usually broadcast in the beds and the seedlings thinned out to 9 inches apart, but with care they can be transplanted.

#### *Centaurea*, or Cornflower

Colours: intense blue, pink, white and deep wine. Height 2 feet. Broadcast the seed in the beds and thin out 12 to 16 inches apart. Acclimatized seed does well for a season or two.

#### *Chrysanthemum* (annual)

Showy flowers, both single and double, height 12 to 24 inches. Transplant to 18 inches apart.

## THE GARDEN IN THE PLAINS

### *Clarkia elegans*

Long sprays of flowers in white, crimson, various pink shades and salmon-scarlet. The last colour is perhaps the most effective. Height 2 feet or more. Plants need very thorough drainage and are best grown in raised beds with light, friable soil. Broadcast the seed and thin out to 18 inches apart. Liable to leaf curl. If the plants are at all overcrowded, thin out and be very careful not to water too heavily.

*Coreopsis*. See 'Hot weather annuals'.

### *Cosmea*, or *Cosmos*

Very dainty flowers in white, pinkish-mauve, and claret. A useful flower for growing in clumps towards the back of the mixed border, or in beds for cutting. Height 2½ feet or more. Can be grown at most times of the year, but is liable to run to leaf in rains and is easily damaged by heavy rain or wind. In places where frosts occur about Christmas, sow the seed to flower in the early hot weather. Acclimatized seed does well for a season or two, but after that the magenta-pinks seem to predominate among the flowers.

### *Cynoglossum amabile*, or Chinese Forget-me-not

Blue flowers resembling forget-me-nots, height 15 to 18 inches. Very pretty in the mixed border where they should be planted in groups to make a large patch of misty blue. Mixes well in a bed with gypsophila, either white or pink.

### *Dianthus*, or Pinks

*D. chinensis*, the Indian pink, grows about 9 inches high. Transplant to 9 inches apart. Colours vary in white, pink and red shades. Particularly suitable for a cold weather outdoor rock garden. If the plants are cut back after blooming, a second crop may result. Requires a light soil, with a sprinkling of lime added.

*D. hedderwigii*, the Japanese pink, is available in many beautiful colours. Height 8 or 9 inches. Treatment similar to the Indian pink.

### *Didiscus Coeruleus*, or Blue Lace Flower

Dainty blue-mauve flowers, suitable for a mixed border. Height 18 inches. Can be transplanted with care, but is often sown direct and thinned out to 18 inches apart.

*Dimorphotheca*. See 'Annuals suitable for pot work'.

## THE ANNUAL FLOWER GARDEN

### *Eschscholtzia*, or Californian Poppy

A perennial grown as an annual in India. Colours: orange, yellow, buff, cream or rose shades. The orange shade predominates as a rule. Height 12 inches. Broadcast seed direct in open beds and thin out to 12 inches. Does not stand up well to transplanting. Acclimatized seed does well for a few seasons. Do not over-water the plant.

*Gaillardia*. See 'Hot weather annuals'.

### *Gypsophila*

The white *G. elegans* is 18 inches high with dainty little flowers. The large-flowered is a more handsome type. Less often seen are the pale pink and crimson colours. Broadcast the seed and thin out to 9 inches.

### *Hollyhock*

Only the single-flowered type does well on the plains. Colours: pink, deep red or white. Acclimatized seed flowers earlier than imported seed. Sow direct or transplant very carefully to 18 inches apart. Very useful to give height to the back of the mixed border, planted in groups, or grouped by a gate.

### *Hunnemania*, or Golden Cup Poppy

A perennial grown as an annual on the plains. On occasion the seed takes a long time to germinate, and often the plants fail to flower before the hot winds start. Sow direct or transplant very carefully to 15 inches apart. Height 18 inches. Clear yellow flowers and grey-green foliage. Very useful in the mixed border.

### *Larkspur*

Colours: white, pale pink, deep rose, blue, pale mauve and deep purple. Height 2 or 3 feet. Broadcast and thin out to 9 inches apart. Useful in big patches in the mixed border, or is spectacular bedded alone. The stock-flowered is the best to grow. Seed will not germinate until the nights are cold. Acclimatized seed does well for a season or two, but after a time the blue flowers predominate over the other shades.

### *Leptosiphon*

A dwarf plant growing a few inches high only, with

#### THE GARDEN IN THE PLAINS

little flowers in white or rose shades. Suitable for the cold weather rockery of annual flowers.

##### *Leptosyne*

Lemon yellow flowers and light foliage. Height 18 inches to 2 feet. Broadcast seed in well-drained beds and thin out to 10 or 12 inches. Blooms in about 6 weeks from the time of sowing.

##### *Linaria*

Pretty little flowers like miniature snapdragons. Colours: white, yellow, pink, mauve and crimson. Height about 15 to 18 inches. Broadcast seed and thin out to 9 inches.

##### *Linum*, or Flax

Both red and blue flowering types. Broadcast and thin out to 7 inches. Height 15 to 18 inches. Very pretty, but has a short flowering period.

##### *Lobelia*

Small blue flowers, the plants being available in dwarf, tall and spreading types. The tall kind does well in pots, the dwarf class for edgings, and the spreading type for hanging baskets. The plants flower late in the season.

##### *Lupin* (annual)

Blue, white, pink and yellow flowers. Height, 2 feet for the tall types, 12 inches for the dwarf kinds. Sow direct, 15 to 18 inches apart. Soil must be light and not too rich.

##### *Marigold*

The African variety has large, round orange or lemon coloured flowers. Height 2 to 2½ feet. There is also a fine single variety with frilled petals. Useful for groups towards the back of a mixed border. Transplant to 15 inches apart.

The French variety has smaller flowers, yellow blotched with brown, or reddish-brown flowers marked with deep yellow. Height 12 to 18 inches. There is a dwarf variety too. Transplant to 9 inches apart in light, rather poor soil.

Marigolds are often raised in the early hot weather.

##### *Mathiola bicornis*, or Night Scented Stock

Pale lilac flowers which look shrivelled during the day in hot sunlight, but open in the evening. Height 12 inches.

#### THE ANNUAL FLOWER GARDEN

Because of its inconspicuous flowers it does not deserve a place in the foreground of the border, but grow a few plants near the bungalow windows, so as to get the benefit of the very sweet smell in the evening.

##### *Mignonette*

Green and rust-red or green and yellow, scented, flowers. Height, 12 to 15 inches. The seeds should be broadcast where they are to remain, and the plants thinned out to 12 inches apart. *Mignonette* seems to like a firm bed to germinate in. Before sowing the seed, water the soil very lightly, then cover the damp earth with a thin sprinkling of dry soil and pat it down firmly and evenly. Broadcast the seeds sparingly over the surface and cover them with a layer of finely sieved earth. Put down the seed in several sowings to get a succession of flowers.

##### *Nasturtium*

Very useful flowers with their many rich colours. The dwarf Tom Thumb variety is good for bedding, the seeds planted 8 or 9 inches apart. The tall or creeping types are usually seen in the hills rambling over a bank or up a low trellis, but they are sometimes grown on the plains in baskets hung from the eaves of a sunny veranda.

The Double Gleam varieties are very handsome and sweet scented. There are both semi-tall and dwarf Double Gleams, in attractive yellow, orange and red shades.

If the soil is too rich nasturtiums run to heavy leaf growth which hides the flowers, but even poor soil must be well cultivated if the plants are to thrive. Full sun is essential. Sow the seed where the plants are to remain. Acclimatized seed does well for several seasons.

##### *Nemophila*

A pretty little plant growing 6 or 8 inches high with blue-mauve flowers. Used mainly as an edging plant. Transplant to 8 or 9 inches apart.

*Nicotiana*, or Flowering Tobacco. See 'Hot weather annuals'.

##### *Nigella*, or Love-in-a-mist

Pretty blue flowers, the dwarf types grow 10 or 11 inches high, and the bedding class 15 to 18 inches high.

## THE GARDEN IN THE PLAINS

### *Nolana grandiflora*

Pale blue convolvulus-like flowers. Height 9 inches. Spreads well and is useful for the outdoor rockery of annual flowers.

### Pansy, or Heart's Ease

Many rich colour combinations are now available; blue, purple, white, yellow and red being the predominating shades. Light shade is advisable. The plants can be grown in shallow pots or *gumlahs*, or in beds under the eaves on the east or north-east side of the house. Soil, rich and well cultivated. Seedlings should be transplanted several times before they are finally planted out. Better flowers are obtained if the plants are not allowed to spread or run to leaf. Each plant should be 7 or 8 inches from the next.

### *Petunia*

For bedding purposes the single varieties are best. They vary in height from the compact types which only grow 8 or 9 inches high, to the taller bedding varieties which grow to 18 inches. Plant the compact class 12 inches apart, and the taller varieties 15 to 18 inches apart. The seeds are sometimes broadcast direct in the open beds, but as they are very small it is safer to sow them in seed boxes and transplant the seedlings carefully.

Double petunias and the large, frilled single types are best grown in pots or hanging baskets.

Petunias are often sown in September or at the beginning of October and grown as a winter annual, but in districts where frosts occur it is better to sow the seed for flowering in the early hot weather.

Colours: white, pink, mauve, purple or wine, the flowers being faintly scented. Some of the large petunias are beautifully veined.

### *Phacelia*

Pretty bright blue flowers. Height 12 inches. Transplant to 12 inches apart. More attractive as a patch in the mixed border than bedded alone.

### *Phlox drummondii*

One of the prettiest and most useful annuals for the plains. The dwarf compact types grow about 6 inches high and are used as edging plants. By far the best class for

## THE ANNUAL FLOWER GARDEN

bedding is the large-flowered, the plants growing 12 inches or so high. Sow the seed in boxes and transplant the seedlings when they are a few inches high to the open beds, 12 inches apart. Pinch back the leaders to form side shoots quickly. There are many delightful colours. Soil light but rich. Spectacular if grown in beds grouped together, one colour in each bed, or in gay borders with all the colours mixed.

### *Pimpinella monoica*, or Lady's Lace

Lacey white flowers resembling those of wild cow-parsley in England. Grows about 2½ feet high, and is useful in the mixed border. Long sprays of these flowers arrange lightly in vases.

### *Platystemon californicus*

Flowers bright yellow, the plants growing about a foot high.

### Poppy, Shirley or Carnation

Broadcast the seed thinly where the plants are to remain, and thin out to 12 inches. Height 18 inches to 2 feet. The soil should not be too rich but must be well drained and cultivated. Be careful not to over-water poppies. Acclimatized seed does well.

*Portulaca*. See 'Hot weather annuals'.

### *Rudbeckia* (annual)

Golden yellow flowers with raised centres and reddish-brown markings. Height 18 inches. Transplant to 12 inches apart.

### *Salpiglossis*

Very beautiful trumpet-shaped flowers, much veined. Colours: dark blue, deep pink, crimson, white and yellow. Height 3 feet. Rather delicate and erratic as to flowering. Better grown in the mixed border than in beds alone. Plant 12 inches apart. Often grown in pots.

### *Salvia*

A perennial usually grown as an annual from seed except in the comparatively cool districts. Given a protected situation with light shade, it is sometimes possible to carry over the plants from season to season. The scarlet *S. splendens* is very spectacular and should be planted 15 inches apart.

## THE GARDEN IN THE PLAINS

*S. farinacea* has misty blue flowers resembling lavender, and should be massed to be effective. There is also a pink variety that can be grown on the plains.

### *Saponaria vaccaria*

Sprays of pale pink flowers which resemble *gypsophila*. Height 2 feet. Pretty when grouped in large patches in a mixed border. Plant 12 inches apart.

### *Stocks*

These flowers usually do better in the hills than on the plains. Try the ten-week varieties which are the most likely to succeed. Soil should be well cultivated but not too rich. Beds need to be raised to ensure good drainage. Acclimatized seed does well on the plains, but the plants are rather apt to revert to the single flower. Transplant carefully to 15 inches apart. Height 12 to 15 inches.

### *Sunflower*

The tall varieties, height 3 to 7 feet, have flowers in yellow or coppery brown. Sow direct or transplant to 18 or 20 inches apart. Very useful in groups towards the back of a wide mixed border, or in clumps by a gateway.

The miniature types, height 3 or 4 feet, are useful for the mixed border.

### *Sweet Pea*

The early flowering varieties are the best to grow on the plains. Good drainage is essential for these plants, and a light, sandy soil is desirable.

Prepare the beds several months before sowing the seed. Dig a trench 2 feet wide and 2 feet deep, running north and south for preference. Take out the loose earth and fork the ground at the bottom of the trench. Replace about a foot of soil, on top of which place a thick layer of rotted cattle manure or compost mixed with a sprinkling of wood ashes, and mix this dressing thoroughly with the loose soil below. Replace the rest of the soil mixed with a thinner layer of manure and a sprinkling of wood ashes. The reason for this thicker layer of manure underneath is that sweet peas have long roots and like their richest food well below the surface of the ground. Turn in 2 oz. bonemeal per yard of trench. During the time between preparing the bed and sowing the seed the soil should be kept clean and free from weeds.

## THE ANNUAL FLOWER GARDEN

At planting time fork the bed deeply. Smooth over the soil so that the surface of the bed is quite level and press the earth down firmly, for sweet peas do not like a loose soil.

If a sweet pea hedge is wanted, put a row of thin bamboo stakes arranged in a criss-cross pattern down the centre of the bed, alternatives being a line of twiggy branches, or strips of wire netting attached to a few wooden stakes. This central support should be quite 6 feet high.

Plant the seeds 4 or 5 inches apart in two shallow drills or furrows, one placed along each side of the row of stakes, at a distance of 4 or 5 inches from the stakes. Cover the seeds with half an inch of soil. There should be 5 or 6 feet between separate hedges of sweet peas.

Sometimes a pillar form is preferred to a hedge. This is a good way of growing sweet peas if you want to keep the colours separate. For pillars separate circular beds are dug, each about 30 inches in diameter. A ring of stakes is arranged in the centre of the bed, in a circle 12 to 16 inches in diameter. The seeds are planted in circular drills round the group of stakes.

Seeds take from 8 to 12 days to germinate as a rule, the creams, whites and lavender-blues usually germinating the quickest.

When the plants are about 4 inches high, pieces of thin brush-wood can be placed at the foot of the stakes to give the young plants something they can grip on to easily. As the plants grow tie them to the stakes so that they are not wrenched away by wind.

Many gardeners allow their sweet peas to grow up naturally, but stronger side branches result if leaders are pinched back when the plants are about 7 inches high. If specially good flowers are wanted, select two or three branches only on each plant for growing on, and remove new growth appearing at the axils of the leaves, other than the flower stalks.

When the flower buds begin to form, water the plants with liquid manure twice a week. (See 'Liquid manure' in the chapter on 'Soil and Manuring'.) An alternative is to treat the plants with an artificial fertilizer.

### *Fertilizer for sweet peas*

- 1 oz. sulphate of potash
- 1 oz. sulphate of ammonia
- ½ oz. superphosphate

## THE GARDEN IN THE PLAINS

Dissolve in 5 gallons water (two 2½-gallon watering cans). This will stimulate growth and also assist flowering.

### *Sweet Wivelsfield*

A cross between *Dianthus allwoodii* and sweet william. The flowers resemble those of the sweet william, but bloom much better on the plains. Transplant to 9 inches apart.

### *Tithonia speciosa*

A tall plant with reddish-orange flowers. Height 5 or 6 feet. Very useful at the back of a wide mixed border.

### *Verbena*

A low spreading plant about 9 inches high. The seed should be sown as early as possible in seed boxes, and the seedlings transplanted to open beds, 12 to 16 inches apart. Very pretty grown in beds edging a paved path, in the foreground of a mixed border, in baskets or pots, or in the cold weather outdoor rockery of annual flowers. There is a wide colour range.

*Zinnia*. See 'Hot weather annuals'.

## Everlasting flowers

### *Acrolinium*

A small plant 12 inches high, with pink or white flowers. Transplant to 9 inches apart. Flowers in about six weeks from sowing.

*Globe Amaranth*. See 'Hot weather annuals'.

### *Helichrysum*

Tall annuals growing about 3 feet high with many coloured, papery flowers. Transplant to 15 inches apart.

### *Rhodanthe*

About 12 inches high with pink or white flowers. Benefits by being transplanted several times.

### *Statice*, or Sea Lavender

*S. spicata* is a dwarf annual with puce-coloured everlasting flowers. Often grown in pots. The *sinuata* types are more often seen on the hills.

## Hot weather annuals

After removing the dead cool-season flowers, dig

## THE ANNUAL FLOWER GARDEN

the beds thoroughly and turn in a little very old, decomposed cow manure or compost.

It must be remembered that summer temperatures vary a lot from district to district, and in some places flowers may not flourish at all until the rains break.

Sow seed in December or January for early hot weather flowering and from the beginning of April to the end of May for rains flowering.

### *Amarantus tricolor splendens*

A hot season foliage plant with crimson, bronze-green and yellow leaves. Height 18 inches. Plant 15 inches apart.

### *Arctotis*

Can be grown as a winter or hot-season annual. Flowers white with blue-mauve centres. Height 2 feet. Plants 12 inches apart.

### *Balsam*

The annual camellia-flowered and rose-flowered varieties are particularly useful for filling in the main flower beds in the rainy season, or they can be grown in pots, 3 to a 10-inch pot. The seedlings benefit by being transplanted several times before being planted out. Height, 15 to 18 inches. Distance apart, 8 inches. The flowers can be pulled off and floated in a shallow bowl, as a centre piece for the dining table when other flowers are short. Colours: white, mauve, pink and red.

### *Cacalia*, or Tassel Flower

Flowers bright red or vivid orange. Height about 12 inches.

### *Celosia*

*C. cristata*, or cockscomb, has flowers of red, deep magenta and yellow. Height 7 to 9 inches. Distance apart, 12 inches.

*C. plumosa*, the feathery cockscomb, is 18 inches high, and has yellow, scarlet and crimson flowers. Plants should be 12 to 15 inches apart.

### *Coreopsis*

A very useful flower that can be grown at all times, but

## THE GARDEN IN THE PLAINS

is usually raised for blooming in the early hot season. Often broadcast direct in beds, but can be transplanted carefully if the beds are not free at sowing time. Height 1 to 2 feet. Plant 12 inches apart. Colours: yellow and brown shades.

### *Cosmea klondyke*

This is the orange-flowered cosmos usually grown in the early hot weather. Broadcast the seed direct in the beds if possible, as it needs care in transplanting.

The pink, mauve and white types of cosmos are usually grown in the cool season in places with a mild winter, but they can also be grown in the early hot weather.

### *Gaillardia*, or Blanket Flower

These flowers can be grown in the cool season in many places, but because the selection of plants for hot season flowering is limited, they are usually grown then.

Colours: yellow and reddish-bronze, both single and double-flowered types. Height 12 to 18 inches. Distance apart, 12 inches.

### *Globe Amaranth*

Small everlasting flowers in white, pink, purple and orange. Height 12 to 24 inches. Plant 12 inches apart. Can be grown in both hot season and rains.

### *Hibiscus manihot*

A small perennial shrub, with pale yellow flowers and dark maroon eyes. Grown for flowering in the rains when flowers for the beds are scarce. Height about 4 feet. Distance apart, 3 feet.

### Marigold

Although the African marigold is grown as a cold weather annual in many districts (see 'Cold weather annuals') the French type is more often raised for the hot season and rains.

### *Mirabilis jalapa*, Marvel of Peru, or Four-o'clock Plant

A tuberous-rooted plant with flowers rather like a convolvulus in white, pink and reddish shades. Easily grown from seed sown about April. Often seen in old-fashioned gardens. The flowers open in the evening at about four o'clock. Height 2 feet. A perennial by nature.

## THE ANNUAL FLOWER GARDEN

### *Nicotiana*, or Flowering Tobacco

Colours: white, pink and red. Height 3 feet. Broadcast the seed direct in the open beds and thin out 2 feet apart. Needs great care if transplanted and usually perishes. *N. sanderae* is one variety grown extensively, but it has little or no scent. *N. affinis* is the old-fashioned kind which has a very sweet scent in the evenings. Sometimes grown at the back of a mixed border in districts where the cold season is very mild, but more often raised to flower in the early hot weather.

### *Petunia*

Often grown as a cold season annual in places with a mild winter, but in some districts succeeds better in the early hot season. See 'Cold weather annuals'.

### *Portulaca*

A small edging plant with fleshy leaves and stems and brilliant flowers, either single or double, in white, yellow, apricot, pink and red. The flowers close in the evenings when the sun goes down. Soil light but rich. Can be grown on the outdoor rockery of annual flowers, or in chinks between crazy paving in places with a mild cool season, but is often raised to bloom in the early hot weather. Broadcast the seed where it is to remain and thin out to 6 inches apart. Needs care if transplanted. Full sun essential.

### *Sunflower*

Usually grown as a cool season annual in groups towards the back of the mixed border; but both tall and miniature types are equally good for the same purpose in the hot and rainy seasons.

### *Tithonia speciosa*

A tall plant with reddish-orange flowers useful for the back of the mixed border at most times of the year.

### *Torenia*

*T. fournieri grandiflora* has white flowers blotched deep blue. *T. bailloni* has yellow flowers with deep blue throats.

These flowers are used for bedding, but are often grown as pot plants. Height 1 foot. Usually sown in early April to bloom in the rains.

## THE GARDEN IN THE PLAINS

### *Ursinia anethoides*

Bright orange daisy-like flowers with purplish centres. The plants are about a foot high, and the foliage is finely cut. Useful for drier districts.

### *Verbena erinoides*, or Moss Verbena

A low-growing perennial that can be raised as an annual to flower in the hot season. Flowers white, mauve and pink, and foliage rather like that of cosmos. Spreads rapidly and is a useful plant for an outdoor rockery, for hanging baskets, or to grow in chinks between crazy paving.

### *Vinca rosea*

A perennial that can be grown as an annual to flower in the hot season. Height 12 to 15 inches. Transplant to 12 inches apart. Colours: white, mauve and pink. Seedlings spring up all round a plant.

### *Zinnia*

Very handsome flowers in shades of yellow, orange and scarlet, and pastel tones of pink, buff and apricot. There are many hybrid new varieties nowadays, but the giant double zinnia is still the most showy. Height 15 to 24 inches. Soil light and rich. Sow in seed boxes and transplant the seedlings when sturdy and a few inches high, to the open beds. Plant 12 inches apart. Nip off the first buds to encourage bushy plants. Best grown to flower in the early hot weather, although they sometimes do well in the rains too.

*Z. linearis* is a small perennial plant, with single yellow flowers, that succeeds well in the hot weather.

### Annuals for districts with no marked cold weather

In Southern India where there is no marked cold season, the choice of annual flowers is comparatively restricted. Those flowers mentioned in the section 'Hot weather annuals' are suitable, and cosmos, red and blue salvia, nasturtium, marigold, pinks and *Phlox drummondii* are often grown as well. Gerberas sometimes succeed in pots.

## THE ANNUAL FLOWER GARDEN

### Annuals suitable for pot work

People living in flats can still have the interest of growing annuals by raising them in pots on a sunny veranda. Most flowers that are fairly low growing are suitable, the smaller kinds in 8-inch pots and bigger plants in 10-inch pots.

In some show gardens where there must be colour in the beds most of the year, the flowers are raised in pots and brought to the beds when in bloom, the pots being sunk in the soil, level with the ground. In this way the succession of plants can be practically continuous.

Prick out the seedlings which have been sown in boxes and transplant them into small 4- or 5-inch pots. In this first potting they should be planted in a compost as follows:

#### First potting

- 3 parts garden soil
- 1 part very old rotted cattle manure

Later transplant again to 8- or 10-inch pots, containing the following compost.

#### Second potting

- 1 part rotted cattle manure
- 1 part leaf mould
- 2 parts garden soil

Keep the pots in a shady place until the seedlings have recovered from the shock of transplantation, then move them into the sun. Stake any tall-growing plants when they are 8 or 9 inches high.

The following is a list of flowers specially suited to pot work.

#### *Abronia*

A small creeping plant with succulent stems and flowers very much like those of verbena. Sow seeds in October. One plant to an 8-inch pot, or three to the 12-inch size.

*Angelonia grandiflora*. See 'A few perennials'.

## THE GARDEN IN THE PLAINS

### *Aster*

Height 15 to 18 inches. These handsome flowers are sometimes grown as bedding plants, but they are particularly suited to pot work. Transplant the seedlings, one to an 8-inch pot. Well-known types are the Ostrich plume, the Comet and Victoria. Single asters are best grown as bedding plants and are good for cutting.

### *Calendula*, or English or Pot Marigold

A hardy annual which is equally effective as a bedding plant or in pots. Flowers orange or pale lemon. Height 12 inches. In beds, plant 9 inches apart : in pots, one to the 10-inch size. Sow in early October.

### *Carnation*

Most people are anxious to grow carnations, but these flowers are not always satisfactory on the plains, often not blooming until the second year from seed. With care some plants manage to survive the rains, but the warm, damp atmosphere may prove fatal to many of them. Carnations are usually grown in pots, although they can be bedded out in the cool months, being potted and brought to a veranda for protection in the really hot weather and rains.

The hardy border carnations succeed better in the hills than on the plains. For low elevations the early perpetual varieties are best, as they usually flower the same year from seed, if forced on.

Theoretically the seed should be sown as early as July or August, to give the plants as much time as possible for the season's flowers. Actually, early seedlings are very apt to damp off, so to be on the safe side keep half the available seed to be sown later towards the end of September. A certain percentage of single flowers are inevitable among seedling carnations, and these should be thrown out. Vigorous double-flowered plants should be layered or cuttings of them taken in an attempt to preserve the strain until the following season.

Layers are taken from basal shoots which are prepared and pegged down into the soil. (See the section on 'Propagation by layers' in the chapter on 'Plant Propagation'.)

Cuttings are best taken from leaf shoots about  $4\frac{3}{4}$  to 6 inches long, pulled off very gently from the parent stem. Trim the end of the cutting and plant it upright with

## THE ANNUAL FLOWER GARDEN

an inch of its length beneath the soil, in shallow pots or *gumlahs* filled with a porous compost of half sand and half light garden soil. An alternative is the 'light compost for delicate cuttings' recommended in the chapter on 'Plant Propagation'. The cuttings will need careful watching to see that they are adequately watered, perhaps several times a day, as moisture drains away quickly from such light composts.

Seeds are sown in a light compost, and when the seedlings are about 2 inches high they can be transplanted singly to 4- or 6-inch pots in a compost made up as follows.

### *First potting*

- 1 part rotted cattle manure
- 3 parts garden soil
- a little sand

When the plants are 5 to 6 inches high, transplant them to 8-inch pots, the compost being as follows.

### *Second potting*

- 2 parts old horse or cattle manure
- 1 fistful broken lime mortar or lime rubbish
- 2 parts garden soil
- a sprinkling of sand

Only 3 to 6 stems should be kept to a clump, so cut off superfluous side-shoots. Retain the terminal flower bud and the third bud, nipping off the second and all buds below the third bud, so leaving two flowers to a stem. If bigger flowers are desired take off all except the terminal bud. After the plants have established themselves in the larger pots, liquid manure can be given every 5 or 6 days until the buds are about to open. (See 'Liquid manure' in the chapter on 'Soil and Manuring'.)

Stake all plants securely. Special flower rings are procurable which prevent the calyx from splitting and keep the flowers a good shape.

### *Cineraria*

A very handsome plant. Height 12 to 16 inches. Two main types, the star and the large-flowered. Colours : white, dark or light blues, pink and deep red. This is a delicate flower on the plains and the plant should never be exposed to wind or strong sun. The best place to rear the plant

## THE GARDEN IN THE PLAINS

is in a lightly shaded fernery. Transplant from seed boxes to small pots. Sow early October. Acclimatized seed does well.

### *Delphinium*

Delphiniums do not succeed on the plains as a rule. The 'blue butterfly' is a dwarf type sometimes seen in pots. Sow in September. Germination erratic.

### *Dimorphotheca*, or Star of the Veldt

Daisy-like flowers in yellow, orange and pinkish-apricot colour ranges. Height 12 inches. A good bedding plant but also excellent for pots.

### *Petunia*

The double and large-frilled single varieties are best grown in pots or hanging baskets. Transplant one seedling to a 10-inch pot.

*Salpiglossis*. See 'Cold weather annuals'.

*Torenia*. See 'Hot weather annuals'.

### A few perennials

In the average plains district very few perennial flowers for bedding survive the hot weather and rains. In hill stations, pentstemons, perennial poppies, delphiniums and many kinds of michaelmas daisies are seen, but at low elevations we must be content with quite a short list.

### *Angelonia*

*A. grandiflora* is a perennial growing about 2 feet high with deep blue-mauve flowers. There is also a white-flowered variety, *A. alba*. Usually grown in pots on the plains. Easily propagated by cuttings.

### *Aster amellus*, or Michaelmas Daisy

The hardy blue-mauve variety is sometimes seen. It should not be allowed to spread unduly or to run to leaf at the expense of the flowers. Easily propagated by division of the roots, the young side-shoots making good plants.

### *Gerbera jamsoni*, Transvaal or Barberton Daisy

These are large single daisy-like flowers in many attractive colours, both brilliant and pastel shades. Soil light and

## THE ANNUAL FLOWER GARDEN

fairly rich, with a sprinkling of wood ashes added to the compost.

Gerberas like a sunny situation in cool weather, but during the summer months they should be lightly shaded if left out in their beds. In most places it is better to take up the plants in the spring, divide each clump into 3 or 4 pieces, or more if the clump is a big one, and pot each piece separately in very light, sandy soil in 6-inch pots. After 4 or 5 weeks they should be transferred to a similar sized pot but in a richer compost. Keep the pots in a shady place. In September the plants can be bedded out in the garden and will provide flowers all through the cool season.

It is rather difficult to grow gerberas from seed, partly because the seeds do not keep well, and also because only a few seeds from each flower are likely to prove fertile. Seeds are best collected in the season when the plants bloom most prolifically, from flower heads which are nearly dry. Infertile seeds are very fine, thin and almost lost in fluff, while fertile seeds have a dab of fluff at one end only. Sow the seed as soon as it is dry. Prick out the seedlings to 4 inches apart in seed boxes. In about 6 weeks from pricking out, transfer singly to 6-inch pots. In 9 or 10 weeks renew the soil in the pots. Transplant to open beds early in October.

*Hibiscus manihot*. See 'Hot weather annuals'.

*Mirabilis jalapa*. See 'Hot weather annuals'.

### *Salvia*

Although salvias are often grown as annuals from seed, many of them are perennial by nature and sometimes survive from season to season in comparatively cool districts. *S. splendens* is easily propagated by cuttings as well as by division of the rootstock. The blue and white types, *S. farinacea* and *S. globosa*, are more often divided. Division or propagation by cuttings should take place towards the end of the rains. Light shade advisable.

### *Ternera elegans*

A perennial by nature, easily grown from seed. The plant grows from 18 inches to 2 feet high, and bears yellowish cream flowers with dark centres rather like those of the evening primrose in form. Does well in a fairly dry climate.

## THE GARDEN IN THE PLAINS

*Verbena erinoides*. See 'Hot weather annuals'.

*Vinca rosea*. See 'Hot weather annuals'.

### Violet

Violets are often disappointing in size in India, but they are sweet-scented enough to justify their cultivation.

The plants benefit by early morning sunshine but do not like the blazing midday sun, and although they need moisture they cannot stand up to heavy rain. The best place to grow them is in a well-drained bed under the eaves on the east or north-east side of the house, or they can be grown in shallow pots or *gumlahs* on a veranda of the same aspect.

Soil should be light and rich, with well-decomposed cow manure and some leaf mould in the compost, and a sprinkling of wood ashes forked in. Applications of dilute liquid manure made with poultry dung are beneficial. Divide the plants early in September and re-plant the runners 9 inches apart in rows, triangular fashion, or 3 plants to a 12-inch *gumlah*. After dividing the roots of the violets cut down the stems to a couple of inches from the ground, and so avoid undue evaporation of moisture from the leaves. The new leaves will appear quite soon.

A fungus disease is apt to attack the plants, the cause often being poor drainage or overcrowding. If the attack is slight try watering with a solution of 4 oz. copper sulphate in 2½ gallons of water, made in and applied from a copper, wooden or earthenware vessel. If the disease is virulent the plants must be burnt and new ones planted in a fresh bed.

*Zinnia linearis*. See 'Hot weather annuals'.

## Chapter xvii

### LILY BULBS AND TUBERS

'Funny little fellows, bulbs! Their ivory bodies so clear and firm, tight swaddled in fine brown silk.'

—Marion Cran: *The Garden of Experience*



Bulbs, stem-tubers and root-tubers—Soil and propagation—Bulbs specially suited to pot work—Outdoor lilies—Storing bulbs and tubers—DAHLIAS

**L**ILIES are satisfactory plants, for the hardy kinds need very little care and reproduce themselves to form fine clumps. The more delicate varieties that are grown in pots on the veranda or in the fernery provide that individual interest always connected with pot gardening.

#### Bulbs, stem-tubers and root-tubers

To the average beginner a 'bulb' means any plant with bulbous or swollen rootstock under the ground. Actually, there is a great difference between a bulb, a stem-tuber, and a thick rooted plant like the dahlia. Although these thickened parts all have the same purpose, i.e. to store food, the swellings form in different parts of the plant in each case, either as an underground leaf bud, a thickened underground stem or shoot, or swollen roots.

A *bulb* with its wrapped-round scales is a modified leaf bud growing underground. Beneath the bulb is a small flat disc which is really the stem, from which spring the roots. This formation is clearly seen in

the onion. Examples in the flower world are lilies, daffodils and the like.

*Stem-tubers* are swollen, modified underground stems bearing 'eyes' or buds from which grow new shoots, examples being the potato and arrowroot. *Corms* and *rhizomes* differ from stem-tubers in construction and arrangement, but are the same in principle. Examples are the gladiolus (corm), and the canna (rhizome).

*Root-tubers* are different from stem-tubers and rhizomes. They are actually swollen roots which do not bear 'eyes', the new shoots springing from the crown or neck at the base of the stem above.

These paragraphs are not so irrelevant to straightforward gardening as one might think. For instance, if a single root-tuber from a dahlia is planted it will be found that no growth will result unless a piece of the bud-bearing neck or stem above is attached to the root. The term 'division of the rootstock' means division of the underground parts of the plant, each divided piece including both actual roots and stems bearing 'eyes' or buds.

### Soil and propagation

Lilies need well-drained, friable soil in which the bulb can develop. Leaf mould and rotted cattle manure are valuable both as food and for lightening the soil. Some lilies prefer partial shade whilst others will thrive in full sun.

Bulbs and tubers can be propagated by division. If the plant is one that is in leaf continually, then division may be carried out after the flowering period. On the other hand, if the plant has a dormant phase and the leaves die down, division should be done during this resting time. Amateurs seldom grow lilies from seed.

### Bulbs specially suited to pot work

Most bulbous plants can be grown successfully in pots. Perhaps those most suitable are plants bearing particularly large and showy flowers which call for the isolation of a 'specimen' piece, and those that are somewhat delicate and need controlled conditions. Lilies that prefer shade can be grown in the fern-house or on a veranda with a north-east aspect, while those that like sun can be housed on the steps of a veranda facing south-east.

A layer of small pieces of broken brick, or crocks with the hollow sides downwards, should be spread over the drainage holes at the bottom of the pot. A good compost for potting lilies is as follows.

#### Compost for potting lilies

- 1 part very old and rotted cattle manure
- 1 part leaf mould
- 3 parts light garden soil
- a sprinkling of sand

### Amaryllis

The Amaryllis hybrids look well in pots grouped against the green background of a fernery. Many of the flowers are very handsome, and often the leaves are distinguished by having a white mid-rib.

The bulbs will need re-potting every second year or when the roots fill the pots. The year the bulbs are not re-potted, fork in a top dressing of some very old cow manure, or leaf mould, at the beginning of the growing season. When the leaves start to turn yellow it is a sign that they will soon die down for the bulb's dormant period in the cold weather. As the leaves die back let the soil dry out gradually by cutting down watering until none is given. Growth starts in the early spring, and the bulbs should be re-potted if necessary late in December. Plant one bulb in an 8-inch pot with the tip of the bulb one inch below the surface of the soil. The delicate hybrid Amaryllis need partial shade. Water twice a week, or as needed in dry weather.

In places with a severe cold season Amaryllis lilies die

## THE GARDEN IN THE PLAINS

down naturally. On the other hand, in districts with a mild winter they often have no dormant period at all. The flowers will be better, however, if wintering has been forced on the plants by withdrawing water from them in October until the end of December.

### *Cannas and gladioli*

These can be housed in big pots, or in kerosene tins if the bottoms are perforated, with some drainage material over the holes underneath the soil. Both these plants will require a sunny situation.

### *Crinum*

These lilies in several varieties are quite attractive and can be grown in 10-inch pots, or kerosene tins with perforated bottoms. They need shade and a cool situation, and do not like being disturbed. *C. moorei*, the monsoon lily, has white flowers; *C. superbum* has pink flowers; *C. asiaticum*, white flowers. All these lilies are heavy growing with thick stems, and are usually faintly scented, the flowers appearing in the rains.

### *Eucharis grandiflora*

This has white flowers and is excellent for pot work. It needs light shade if it is to thrive, and a rather heavier soil than is usual for lilies. These bulbs do not like constant re-potting.

### *Freesias*

Best planted in September, 5 or 6 bulbs to a 12-inch *gumlah* or shallow earthenware bowl. The bulbs should be just under the soil. Start withdrawing water when the leaves turn yellow, and when the leaves have died down take the bulbs up and store them until planting time comes round again. These plants stand light well, but not the blazing midday sun.

### *Haemanthus*

An exotic plant with a puff-like scarlet flower, shown to best advantage in a pot, the flower appearing in the spring only. Re-pot after flowering.

### *Lilium longiflorum*, or Madonna Lily

This white flowered lily is best grown in a pot in a sunny situation. Big bulbs should be chosen, planted at

## LILY BULBS AND TUBERS

the end of September or early October, the tip of the bulb  $1\frac{1}{2}$  inches below the soil, in a 10-inch pot. The spikes will need staking. The plants will flower in March. If the leaves turn yellow and die down in May or June, withdraw water gradually and store the pots in a cool and dry place until planting time.

### *Polianthes*, or Tuberose

Has creamy, heavily scented flowers and will grow both in full sun and shade. The double 'pearl' is the best variety to grow.

### Outdoor lilies

#### *Amaryllis and Hippeastrum*

The *Amaryllis* group and the *Hippeastrum* (which much resemble the *Amaryllis*) provide hardy lilies that will grow in either shade or sun. Choose the common red, white or terra-cotta varieties for outdoors. The bulbs should be planted with the tip or growing point one inch below the ground.

These lilies can look very charming planted in large drifts on grass under trees, or in pockets cut in the banks of a 'tank'.

### *Crinum*

The varieties mentioned in the foregoing section can also be grown outdoors in a cool and protected spot. They are useful for a shady border, or can be placed in pockets cut in the banks of a 'tank' provided there is some shade.

### *Gladiolus*

This is a fine lily for bedding. The corms should be planted in late September or early October, each about 2 inches below the soil, in well drained beds. Water two or three times a week, as necessary. Start to withdraw water when the leaves begin to turn yellow, and when the plants have died down lift the corms for storing.

*Gladioli* are well suited to bedding alone and look effective if massed in fairly large beds, the corms 9 to 11 inches apart according to their size. They can also be raised in groups in a mixed border. Many fine colours are available nowadays.

The spikes should be staked to prevent twisted stems. With small groups of plants there should be a stake to

## THE GARDEN IN THE PLAINS

each spike, attached with loops of raffia. When gladioli are planted in a mass, however, a forest of stakes looks ugly, and it is better to put a line of stakes at the two ends of the bed only, joined to each other across the bed by means of tightly stretched cords. The flower spikes can be attached to the cords with loops of raffia.

### *Hemerocallis*, or Japanese Day Lilies

Hardy plants that will grow both in sun and shade. The colours vary from pale lemon-yellow and bright orange to tawny or copper-orange, the flowers appearing in the hot months. The spikes grow about 2 feet tall.

These lilies are useful for a permanent border such as the foreground of a shrubbery, or they can be grown in clumps between the stones on the rim of a pool in contrast to other plants of low growth.

### *Iris*

The iris is more suited to the hills than to the plains, but in the comparatively cool and moist districts *I. chinensis* and *I. moraeoides* are seen. In common with others of the iris tribe, these benefit from some lime in the soil where they are grown.

The iris, as seen on the plains, can be grown in a border, and looks attractive on a bank near water.

### *Pancratium longifolium*

A tall lily known as the 'spider lily', with white, spidery-flowers that smell faintly of vanilla. The plant has no dormant period, the blooms appearing on and off throughout the year. The flowers are very similar to those of *hymenocallis* seen in the hills.

This lily is most useful for landscape effects, especially near water, and should always be grown in large clumps.

### *Zephyranthes*, or Crocus Lilies

Very pretty little plants with crocus-like flowers appearing in the monsoon. Flowers pink (*Z. rosea*), yellow (*Z. sulphurea*), and white (*Z. candida*). There are hybrid varieties known as *Cooperanthes*, which resemble *zephyranthes* except that their flowers are likely to appear at any time after rain in the warm months.

*Zephyranthes* are often used as edging plants, but they look their prettiest planted in drifts in grass or under trees, and in patches on the outdoor rockery.

## LILY BULBS AND TUBERS

With the exception of gladioli, hardy lilies out in the ground are not removed for resting as a rule. When the clumps have thickened unduly the plants can be divided and replanted, their beds being well dug and some very old manure or leaf mould added to the soil. The years the lilies are not divided, a top dressing of leaf mould and rotted cattle manure should be forked round the plants. If the lilies are in a border which receives regular watering, it would be as well to give them a modified resting period by withdrawing water in their dormant period.

### *Lilies grown in drifts on grass*

Lilies grown in drifts or patches, which really amount to irregularly shaped beds, are easier to cultivate than if they are scattered widely over a large area. The outlines of the drifts should be quite informal so that the lilies look as like as possible to wild flowers growing naturally.

When planting lilies in drifts, the ground where they are to grow should be thoroughly dug to a depth of 15 or 18 inches. Plenty of leaf mould, and some very old rotted cattle manure, if available, should then be mixed throughout the soil. The humus added increases the bulk of the soil a little so that the surfaces of the prepared ground may be an inch or two higher than the surrounding land. Do not smooth away the excess soil, but leave the loosened earth to sink naturally, otherwise a hollow will form where the ground has been dug.

Scatter the bulbs at random over the prepared ground when it has settled, and plant each bulb where it falls. Eventually the surrounding grass will creep back between the clumps, and will have to be clipped with shears from time to time as a mower is of no use where flowers are growing. Be careful

## THE GARDEN IN THE PLAINS

to mark the place where the lilies that have a dormant period are planted, so that they are not lost when the leaves die down. It is better to keep each kind of lily in a patch by itself than to mix many sorts together. There will then be a broad colour effect when they all bloom together.

### Storing bulbs and tubers

Bulbs or tubers that are to be stored should not be removed from beds or pots until the leaves have died down completely. Take up the bulbs, remove loose pieces and tidy them up, then place them singly in rows on a tray made of hessian or gunny, and leave them to dry in the shade for a time. The surface moisture must be allowed to dry out, but tubers especially must not be allowed to shrivel up by too long exposure to the air.

Shallow boxes are generally used for storing bulbs, and clean, sun-dried but cool sand or sawdust are the usual storage materials. Put a layer of sand or sawdust in the box and place the bulbs on top, separately in rows, each bulb with growing point downwards. Cover the bulbs entirely with sand or sawdust, close the box and remove it to as cool and dry a godown as possible.

Ants sometimes get into the boxes, so it is a good plan to make a small wooden stand with shelves to hold the boxes of bulbs, with its legs resting in saucers of phenyle and water.

Bulbs in pots can sometimes be left where they are if the roots have not thickened unduly. Water is withheld as the leaves die down so that the soil in the pots dries out. When the earth seems really dry the pots can be removed to a cool and dry godown, raised off the ground on stones or bricks so that air can pass freely beneath them.

Those bulbs stored in the hot months should be

## LILY BULBS AND TUBERS

watched for signs of sprouting in July. When these appear, bulbs in pots should be given water and brought back to the fernery, and those in boxes potted if necessary.

Hardy lilies, out in the ground, should be left where they are unless the clumps are to be divided, and then they are usually re-planted straight away.

## DAHLIAS

The dahlia is a plant with fleshy, perennial roots and annual stems. It is propagated by division of the rootstock, by cuttings or by seed.

The named varieties with giant double flowers are usually grown from the root tubers, which will reproduce true to form. Most of these imported dahlias arrive in India early in the year and are mainly grown in the hills, the tubers being planted in March to bloom in the monsoon. The low, semi-hill stations also grow dahlias to flower in the monsoon as a rule, and in some cases this is done on the plains as well.

In many plains districts dahlias are raised in the cool season, to flower in late December and January. The flowers do well in Assam and Bengal, for instance, but in some places the air may be too dry at that season for the plants to thrive.

### *Dahlias as annuals*

The peony-flowered dahlia and many single varieties are grown as annuals from seed sown in late August or early September. Flowers can be expected in about 4 to 4½ months from sowing, and they look fine massed in beds. Drainage must be thorough, the soil light and rich.

Sow the seed in boxes, and transplant the seedlings to the beds when they are a few inches high, each plant 2½ to 3 feet from the next. The height of

#### THE GARDEN IN THE PLAINS

the full-grown plants may be from 2 to 4 feet. Thin out weak branches and buds later if big flowers are wanted.

##### *Dahlias grown from tubers*

For cool season flowering, plant the tubers in September. The neck or crown to which the tubers are attached bears the 'eyes' or buds, so be sure to include a piece of this growing portion of the stem with the roots when dividing rootstock for propagation.

Bury the tubers on their sides about 3 inches beneath the ground, at a distance of  $2\frac{1}{2}$  to 3 feet from each other. In places where the plants are raised in the monsoon, small pieces of charcoal should be mixed with the soil round and beneath the tubers. Water sparingly until signs of growth appear, and when the tubers sprout remove all but the strongest stem. Owing to the brittle nature of the stems and the heavy flower heads, it is important to stake each plant from the time it is a foot high, and to see that the bed is protected from strong winds.

Dis-budding is advisable when three buds appear close together. Retain the centre bud, and nip off the two side flowers. Thinning of the weaker branches also conserves energy for the flowers upon those that remain.

The Decorative or Modern class of dahlia and the Cactus types are popular. The Ball class and the smaller Pompons are old-fashioned but attractive in their way, the Pompons being specially useful as cut flowers.

##### *Resting the tubers and re-planting them*

Plants which have flowered in the cool season will start to die down in late February or March, and water should then be withheld. When the leaves

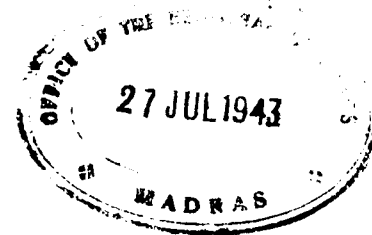
#### LILY BULBS AND TUBERS

have died back, cut off the stems about one inch above ground level. Take up the tubers, making sure that the roots are not separated from the bud-bearing stem. If the rootstock is to be divided, each piece must have a neck or stem to bear 'eyes' or buds.

Examine the tubers carefully, and if they have any cuts or nicks, make a paste of cow dung, soil and water and smear some over the cuts, allowing it to dry on. Dry the tubers and store them as described in the section on 'Storing bulbs and tubers'. Then follows the resting period until growth starts with the rains.

When the monsoon is established in July, the tubers will probably start to sprout, and they should then be taken out of the sand or sawdust in which they are stored. They can now be planted in pots or boxes in light, sandy soil, and given water. When the shoots are 2 or 3 inches high they may be cut off with a part of the tuber and planted in pots or a protected nursery bed, and when they are established, planted out in beds in September or early October, to bloom in the cool season.

Dahlias often do well from cuttings taken from the young shoots, the old tubers being discarded.



## Chapter xviii

# ROSES

'I have been looking through rose catalogues and compiling a list of those plants I want—or, to be exact, of those I mean to order, because I want them all.'

—Kathleen L. Murray: *My Garden in the Wilderness*

THE CLASSIFICATION OF ROSES—What to cultivate on the plains—CULTIVATION, MANURING AND PLANTING—Soils and manures—Planting—Imported roses—Wintering—Watering—Disbudding—THE PRUNING OF ROSES—When to prune—How to prune—THE PROPAGATION OF ROSES—Cuttings—Layers—Budding—PESTS AND DISEASES—Insects—Fungus diseases—THE ROSE GARDEN—Its layout—Standard roses—'Pegging down'—Hedges—Pot planting—A SHORT SELECTION OF ROSES

ABOUT a hundred years ago there were only a few varieties of roses known in India. Then the Rose Edouard, a free flowering Bourbon, was introduced, and this as stock has made possible the culture of many new varieties. Every year the hybridization of roses goes on, till nowadays the great majority of successful bedding plants come into the comprehensive group known as the Hybrid Tea (H.T.) roses. Rarely are pure strains seen, even in the largest gardens or nurseries. Nevertheless, it is very interesting to know something of the origin of present-day types, and for that reason the main classes have been sketched out in a general way in the following section.

## ROSES

### THE CLASSIFICATION OF ROSES

Roses fall naturally into two groups: those of Europe and Western Asia, and those of Eastern Asia. Those of the former group generally bloom in June and July in England and for that reason are sometimes called Summer roses, this class including the Cabbage, French and Damask roses. The second group includes the China and Tea roses, among others. These generally bloom a great part of the year, and are often referred to as Autumn or Perpetual roses, for they flower in the early autumn as well as in midsummer. It must be understood, however, that this division into Summer and Perpetual classes is not a strictly geographical grouping. For instance, the original *wichuraiana* and *multiflora* ramblers came from Japan and China, but the races that bear their names are classed as Summer roses.

The roses of the Summer group do not thrive at low elevations in India as a rule, although they sometimes flower in a few of the cooler dry districts, and also on the high hills. Many of the Perpetual class of roses, and hybrids of the two groups, flourish on the plains as well as in the hills.

Comparatively few of the many species of rose are grown in gardens to any extent. Before describing the hybrids which form the major part of our rose gardens, mention may be made of some of the more important parents which go to make these various crosses.

*Provence* (*Rosa centifolia*), *French* (*R. gallica*) and *Damask* (*R. damascena*) *Roses*

These are old-fashioned roses, and belong to the Summer group.

The *Provence* rose is the *Provence Red* or *Old Cabbage*, the familiar scented red Cabbage rose, and was introduced about 1581. Roses of this class are natives of Asia Minor and Caucasia. The flowers are full and generally very fragrant,

## THE GARDEN IN THE PLAINS

the foliage being pale green margined with red. The White Provence, a sport of the Old Cabbage, is another popular Provence rose.

The Moss roses (*R. centifolia* var. *muscosa*) are related to those of the Provence group, which they resemble, and have, in addition, a moss-like covering of the stems and sepals.

The French roses came from central and southern Europe, and are the oldest roses of European origin. Many of them have blotched or striped flowers. The *Rosa mundi* (white, striped pink) is well known of this group.

The Damask roses are very old and were introduced into Europe from Damascus, possibly by the crusaders. The York and Lancaster (semi-double, white, striped or blotched pink), was introduced in 1551 and is well known. Damask roses are very fragrant.

The above roses are all hardy in England, and of vigorous growth. They are seldom bedded close to the more modern varieties, however, as they need comparatively little pruning. Rose-water is usually made from Provence and Damask roses in Europe.

Roses with the Provence, French or Damask strain were very popular with hybridizers, and they were crossed originally with the China Perpetual class in an attempt to produce a race of roses with a perpetual flowering habit combined with the sturdy growth of the Summer group.

### *Hybrid China, Hybrid Bourbon, and Damask Perpetual Roses*

The Hybrid China group resulted from crossings between the French and China roses, but as the hybrids retained more of the French characteristics than of the China strain, they have been grouped under the *gallica* head.

The Hybrid Bourbons were a free flowering race of robust habit, owning as parents Provence or French roses on one side, and Bourbon roses on the other. Bourbon roses are described later in this section.

The Damask rose crossed with a Perpetual rose produced the Damask Perpetual, and later a Damask Perpetual rose was used as one of the parents of the Hybrid Perpetual (H.P.) class, with a Hybrid China or a Hybrid Bourbon rose as the other parent.

## ROSES

### *Austrian Briar (Rosa lutea)*

These roses belong to the Summer group, and are natives of Austria, Persia and the Himalayas, having been known for many years. Most of them have single flowers. The Austrian Copper (single), introduced in the year 1596, and the Persian Yellow (semi-double) (1838), are noteworthy. Pernet used the latter as one of the parents for his *Pernetiana* strain.

### *Sweet Briar (Rosa rubiginosa)*

The common Sweet Briar is a Summer rose and has a pale pink single flower which when crossed with some other roses gives a popular class of hybrid. The Amy Robsart and Meg Merrilies, both developed in 1894, are examples of these crosses. The foliage of the Sweet Briar is delightfully fragrant.

### *China Rose (Rosa indica, syn. R. chinensis, R. semperflorens)*

The China rose is in the Perpetual class, and since its introduction into Europe has been popular for hybridizing in the attempt to fix the Perpetual strain in other roses. It is closely related to the Bengal rose of India, and China roses were sometimes referred to as 'Bengals' in the old days. Roses of this group are hardy, continuously flowering, and of a semi-scandent nature.

The Monthly rose, Old Blush or Common China, introduced in 1796, is well known, and is popular for rose hedges and for growing on banks or over low walls.

### *The Tea Rose (Rosa indica var. odorata)*

This rose belongs to the Perpetual group, originally coming from China, and many are scented like tea. The growth of the plant is slender and often twiggy, and at the same time branched and spreading, offering a contrast to the sturdy growth of the Provence and Damask classes. The leaves are shiny and the young wood carries a bloom as on a grape. The plants are free flowering, producing richly coloured blooms.

Roses of this group were popular till the advent of the H.T.s. Well-known examples are the Lady Hillingdon, with apricot-yellow flowers, and the Gloire de Dijon (1853), a climbing rose with large and full buff-yellow flowers.

*Musk Roses (Rosa moschata)*

The Musk rose is of the Perpetual class and is found in China, Persia and North Africa, being related to the wild rose of the Indian hills. The flowers are rather insignificant, but have a faint scent like musk and appear in clusters. These are really bush or tree roses, but the plant can be semi-scandent and often climbs trees in China. The Musk rose was crossed with a China rose and produced a hybrid class of climbers known as the Noisette. The Musk roses grown in gardens are nearly always hybrids with a climbing habit.

*Japanese Roses (Rosa rugosa)*

These are Perpetual roses producing large, scented flowers followed by globular scarlet seed pods. The bushes grow big and are vigorous, with strong thorns. *R. rugosa alba* and *R. rugosa rubra* are well known white and deep pink varieties. These roses are popular for hedges.

*Bourbon Roses*

These are Perpetuals, and are a race evolved from a seedling found by Breon about 1817. Seeds from this plant were sent to Jacques, a gardener at the Chateau de Neville near Paris, who raised more plants, the new race being called Ile-Bourbon. The origins are very indefinite, but it is thought by some that the original specimen was a hybrid between a China rose and *Rosa damascena*. Bourbon roses closely resemble the Hybrid Perpetual class. They are not often seen these days, but were popular in India some years ago. This race has been used for hybridizing and many roses have a Bourbon strain in their constitutions.

The Rose Edouard is a well-known Bourbon, and as mentioned before has been particularly useful in India as stock for budding purposes. The Souvenir de la Malmaison, a cross of the year 1853, is a popular descendant of this group with blush-white flowers and great fragrance. The Zephyrine Drouhin is a familiar climbing Bourbon. Bourbon roses have large, glossy leaves which are leathery and thick, and the flowers are fragrant.

*Hybrid Perpetual (H. P.) Roses*

The original Hybrid Perpetual varieties were hybrids between the Damask Perpetual class and Hybrid Chinese or the Hybrid Bourbon roses. Since then many other crossings

have been made, of course. This group became popular in about 1840, and were in great demand in England up to 1890, for during that time they were the only roses of commerce suitable for general bedding. They were then superseded by the newly introduced Hybrid Teas.

H.P.s have quite a long flowering period in England but they are not perpetual bloomers on the plains of India, giving fair-sized flowers in the cool, dry weather only, as a rule. The plants are vigorous but inclined to run to leaf here. The branches have fewer thorns than those of the Tea or H.T. roses, whilst many of the flowers are scented.

Well-known examples are the Frau Karl Druschki, a white scentless, free flowering variety also known as the Snow Queen, and the Hugh Dickson, which is red and scented. Many of our best fragrant red roses are Hybrid Perpetuals.

*Hybrid Tea (H.T.) Roses*

This class was first obtained by crossing the Hybrid Perpetual with the Tea rose, with a view to perpetuating the best points of each parent.

The H.T. group dominates all others nowadays, and the greater part of the average rose catalogue deals with Hybrid Teas. The plants are hardy, able to stand sun and dryness, and flower plentifully. In form the plant is not so twiggy and bushy as the Tea parent on one side, but it bears more branches than the H.P. parent, and these branches are thinner and shorter than those of the H.P. An H.T. bush usually has more thorns than does the H.P., but less than the Tea. Individual roses vary, of course, but this description applies generally.

So much crossing and re-crossing has taken place that some of the H.T.s closely resemble Teas and others H.P.s. Generally those plants inclined towards the Tea parentage do best on the plains of India, for the greater the Tea strain, the more satisfactory in general the hybrid.

*Pernetiana Roses*

The Pernetiana is a comparatively new race developed by the French firm Pernet-Ducher in 1900, by crossing the Persian Yellow Briar with the H.P. Antoine Ducher. The flowers of this group are nearly all yellow, orange or flame shades. The foliage is dark and shining, whilst the wood

## THE GARDEN IN THE PLAINS

is thickish, dark, with strong thorns. Many people consider these as H.T. roses, although this is not strictly the case with the original crosses.

One of the best known *Pernetianas* is the Madame Edouard Herriot or the 'Daily Mail' rose, a vivid flame; another is Independence Day, a yellow. This class is sometimes delicate and shy of flowering in India.

### *Polyantha (Rosa multiflora)*

The Polyanthas are the dwarf varieties of the *multiflora* class, and are also known as the Pompon roses, to differentiate them from the climbing Polyanthas (*multiflora* ramblers). As the name indicates, they are many-flowered, the blooms occurring in clusters.

The Polyanthas have been hybridized so that the original dwarf, bushy plant has given way to a form resembling the H.T. They are continuously flowering and hardy. Those varieties named after the Poulsen family are now well known (D. T. Poulsen, Karen Poulsen and Kirsten Poulsen). Many Polyanthas are useful for low hedges or edgings, and for pot culture.

### *Banksian Rose (Rosa banksiae alba)*

The Banksian Rose (named after Lady Banks) occurs in China, where it climbs trees or bushes 10 to 20 feet high, covered with bunches of small white double flowers, scented faintly like violets. The Yellow Banksian (*Rosa banksiae lutea*) is a very decorative variety. Although these come from China, they are classed as Summer roses, and are more likely to succeed on the high hills than on the plains of India.

### *Climbing Roses*

The climbing roses have been crossed in the same way as bedding roses, and include Hybrid Teas, Noisettes and Bourbon crosses, besides Teas. These are generally perpetual bloomers, and do well on the plains as a rule.

The Noisettes were first developed by crossing the Musk and the China roses, and take the name of a Frenchman called Noisette. The William Allen Richardson and the Maréchal Niel roses are well known in this class.

The Gloire de Dijon, a Tea rose, is a popular climber. A great number of bedding roses may also be obtained as climbers, being sports of the bush classes.

[ 288 ]

## ROSES

### *Rambler Roses*

These roses fall into two main groups, the *wichuraiana* or Japanese class, and the Chinese *multiflora* or Climbing Polyantha class. They are not perpetual bloomers, like the climbers, but flower once a year, the blooms coming in clusters. These are Summer roses and do not succeed well on the plains as a rule, although they are sometimes seen in one or two of the cooler districts, and the higher hill stations.

The *wichuraiana* roses throw out new flowering rods annually, but also bear on the older wood. The original white *R. wichuraiana* (named after Dr Wichura, a botanist) has been crossed with Tea, Noisette and Polyantha roses, producing a hybrid race which bears its name. The Dorothy Perkins is well known of this group.

The characteristic of the original *multiflora* rose and its descendants is that blooms come on the one-year wood, whilst the older wood is practically devoid of flowers. The Crimson Rambler is a popular Rambler of the *multiflora* type, and bears trusses of small, crimson flowers.

Enough has been said to indicate to what degree the different species of roses have been crossed. The Summer roses, such as the Provence or Cabbage, the French, the Damask, the Austrian Briar and the *multiflora* have been crossed with Perpetual roses such as the China, Tea and the Musk, to give hybrids with the characteristics of both parents. Not only has the nature of the bloom been modified thereby, but the form of the plant has been altered.

### **What to cultivate on the plains**

In the plains the Tea, Hybrid Tea and the Bourbons do well among bush roses, and among the climbers the Noisette, and the Climbing Teas and Hybrid Teas.

The Hybrid Perpetual class is not altogether satisfactory, for although the bushes flourish the flowers appear rather sparingly, and in the dry, cool weather only. In places where there is no marked cool season, or a heavy rainfall, these roses are very apt to run

[ 289 ]

## THE GARDEN IN THE PLAINS

to excessive leaf growth at the expense of flowers. There are a few H.P. roses, however, that should be included in the average collection, notably Frau Karl Druschki with beautiful snow-white flowers, and Black Prince and Hugh Dickson, both with scented deep crimson blooms. These are good for pegging down.

## CULTIVATION, MANURING AND PLANTING

### Soils and manures

The rose can be cultivated in almost any soil, but it thrives best in one which contains a good proportion of clay. If the soil is sandy, more care is needed to produce good results. The soil in rose beds must be well cultivated to keep it in good condition.

### Preparing the beds

Good drainage is essential, so that a raised bed, and a 6-inch layer of broken brick or masonry rubble at the bottom of the dug pit, are advantages in districts with a good rainfall.

The rose bed should be prepared well ahead of planting by digging to a depth of about 3 feet, and the soil mixed throughout with some well rotted horse or cattle manure to render it friable. If the bed is prepared shortly before planting, the manure should be omitted from the top 18 inches which may be treated with leaf mould instead. The reason for this is that the roots should not come in contact with animal manure directly after planting. A slightly raised bed makes a good stage for the rose.

### Manuring

Roses should not be over-manured, otherwise the plant runs to leaf or the wood hardens up, according to the nature of the manure given. A layer, 1 to 1½

## ROSES

inches deep, of well rotted horse or cattle manure may be forked into the soil round the plant in October after pruning, or in the latter half of November or early December if the plants have been wintered (see the section on 'Wintering'). At the same time 2 ounces of bonemeal should be forked round each plant. Bonemeal is a slow-acting phosphatic manure which stimulates flowering and encourages good root and wood formation. Vigorous growth is not desirable in the monsoon, and manure should not be given then.

If animal manure is scarce, a well balanced chemical food may be used instead. A suitable mixture of artificial fertilizers, added after pruning and wintering when signs of new growth appear, is as follows.

### Artificial fertilizer for roses

- 2 parts superphosphate
- 1 part sulphate of potash
- 1 part sulphate of ammonia

Fork the mixture into the soil at the rate of 4 ounces per plant or per square yard. Damp the soil before adding the fertilizer, and water the bed lightly afterwards.

A sprinkling of lime may be forked into the soil at the beginning of the rains if the rose beds have been heavily manured the previous autumn, or if the soil is naturally deficient in lime.

After some years a soil may become 'sick' to roses, and then new beds must be made.

During bloom time, liquid manure, made by steeping cattle manure in water, benefits the flowers when applied every eight or ten days. (See the section on 'Liquid manure' in the chapter 'Soil and Manuring'.)

### Planting

Unless roses are planted from cuttings, they are usually bought from a nurseryman or imported from Europe or Australia.

## THE GARDEN IN THE PLAINS

In India there are two seasons for planting: in the rains and in the early dry weather. In the plains, the best time is November or December, but preferably in November. In the hills planting may be delayed until March or April, or may be done in October.

If planting takes place in the rains, bloom will be obtained in the following dry weather. Against this advantage, however, is the fact that roses do not travel well in the monsoon, for they are growing strongly then, whereas in the cold weather they are easily moved in a more dormant state. Again, a very wet spell soon after planting may kill the young bushes.

Roses planted in the cold weather do not bloom until the following season, but it is safer to plant them then unless plants can be obtained quickly and easily in the monsoon.

The plants often arrive partially pruned. Any dead branches should be cut off and straggling shoots trimmed. Examine the roots carefully as they protrude from the surrounding ball of earth, and cut cleanly any damaged ones. Do not remove the earth, but spread out the visible roots naturally and, holding the plant in the hole, fill in the soil, finally pressing it down firmly. The soil should be moist at the time of planting but not too wet, otherwise it becomes sticky with working.

In England many bush roses are budded very low on the stock, and when this is the case with an imported rose the bud should be planted so that the union of bud and stock is about an inch below the soil. In India, the bud graft is sometimes placed several inches up the stock to give the bud a better chance of survival under local conditions, consequently with these roses the point of union is not buried beneath the ground.

## ROSES

Roses should be spaced according to their variety, the heavy growing types like the H.P. needing wider spacing, but for plants of moderate growth a distance of  $3\frac{1}{2}$  or 4 feet apart is suitable.

### *After planting*

After planting, the soil must be kept clean of weeds and watered to keep it reasonably moist. Shading is advisable until the plants have quite recovered from the shock of being transplanted. Each plant should be watched carefully and young suckers below the graft (if the rose is a graft) must be removed. With roses on their own roots those low growing branches which are not needed for renewing the frame should be cut off. Do not let the plants flower (that is to say, disbud entirely) until they have been planted three or four months.

The rose, now planted, will grow in the spring and throughout the monsoon and by the middle of the following October it is ready for pruning.

### *Imported roses*

Roses imported from Europe or Australia usually arrive in a shrivelled-looking condition. They must be examined carefully and dead roots and shoots removed, after which they must be allowed to recover and form new roots before being planted.

Plants from Europe generally reach India in the early cold weather. A trench should be dug deep enough to hold the entire rose, and the bushes stood at intervals along the bottom, their roots being well covered with light, sandy soil, which must be kept moist but not too damp. Matting or a thin layer of thatch grass is then spread over the top of the trench to keep the plants cool and to retain moisture.

Plants from Australia will be dispatched in that

## THE GARDEN IN THE PLAINS

country's autumn, arriving in India at the beginning of the monsoon. These roses are best potted in light, sandy soil in 10-inch pots, under 'cages' of matting or grass.

After a few weeks young roots will have formed on the imported plants, and signs of growth should appear. The plants must then be accustomed gradually to more and more sunlight, started by withdrawing the matting from the trench for an hour each morning, or by putting the pots where they will get the early morning sun. When the roses appear strong they may be planted out.

Some growers consider that imported roses are disappointing in India, and advise budding from the newly introduced varieties on to vigorous country stock, to form bushes with an acclimatized strain in their constitution.

### Wintering

Roses have a definite dormant or wintering period and in order to make the most of the plant in India such a rest is very necessary. So that the wintering process shall be marked some growers bare the roots in October just after pruning and expose them for a week or until the leaves turn yellow and fall. In doing this, soil to a depth of about 6 inches is taken up in a circle of a foot or so round the plant. After exposing the roots, the soil is mixed with rotted cattle manure and replaced. No water is given till the new shoots appear, when the bush is freely watered.

This process is rather drastic, and other growers prefer the milder form of resting brought about by not watering the plant for a month after pruning, instead of removing any soil. The earth dries out and wintering takes place, after which cattle or horse manure is dug into the soil and water given.

## ROSES

### Watering

During the hot weather roses should be watered every evening in dry climates, and two or three times a week in cooler weather. A thorough watering twice a week is usually enough in districts like Assam and Bengal, unless the weather is unusually hot and dry. The beds should be forked lightly the morning after a good watering.

### Disbudding

If big flowers are wanted, it is advisable to disbud. Usually three buds appear close together, and the centre bud is retained whilst the two weaker side buds are cut off cleanly with a penknife. If you want a show of many blossoms rather than a few fine flowers, do not disbud at all.

## THE PRUNING OF ROSES

When growing wild, the rose usually produces its best blooms on one-year wood, or rather on this year's growth. On two-year wood the flowers are not so good, and further deterioration is seen on still older wood. Finally the old wood dies, but the plant continues to throw out new suckers from its roots, so the rose continues as a young plant.

In the cultivation of roses it is found that a clean plant, free from dead wood and blind shoots, grows better than a plant allowed to run, whilst the quality of the bloom depends on the strength of the wood.

### When to prune

The best time for pruning is from the middle of October till mid-November, and during the earlier part of this period for preference. If the bushes are pruned earlier than October they tend to run to foliage.

The plant which is put out in the cold weather

## THE GARDEN IN THE PLAINS

should be planted out and left until mid-October before it is pruned, although at the time of planting dead branches should be cut off and broken ones trimmed.

A one-year plant which arrives in the cold weather, will probably have been pruned before dispatch. Otherwise cut back hard, as described below, at the time of planting.

### How to prune

Pruning is not a complicated process, for it merely requires some knowledge of the class of bush with which you are dealing, coupled with common sense. It is as well to wear a long sleeved coat and a pair of old gloves while pruning.

#### *The first pruning*

This should be severe and is due in October for the one-year plant put out in the monsoon. It consists of the removal of dead wood, crossing branches and blind shoots. Only about four well spaced branches should be left and these are cut back to three or four 'eyes', the top eye pointing outwards. From these eyes will grow new shoots to bear flowers.

The plant which is put out in the cold weather should have the same treatment, *unless* it has had this first pruning before it arrives.

A bush may not possess a suitable frame for spacing, and may even consist of a single stem. In the latter case the stem is cut back to three or four eyes, and from these a new spread of branches should develop.

Climbing roses should have dead and broken wood taken off at planting, also blind shoots. The two or three main branches which are needed are kept intact, and the others cut back at the base.

#### *The pruning of established plants*

The exact type of pruning will depend on the class of rose.

## ROSES

The simple frame, consisting of, say, four branches, each cut back to three or four eyes, which was all that was left after pruning the one-year-old plant, has now developed into a bush, with a large number of branches.

(1) First of all the dead wood is cut away, blind, twiggy stuff removed, crowding and crossing branches eliminated. This should leave four or five branches, or perhaps three on a weak bush, with their smaller lateral or side branches.

This is the first procedure for Teas, Hybrid Teas, Pernetianas, Hybrid Perpetuals, China roses and Dwarf Polyanthas.

(2) We have now a bush with three, four, or five branches, from which grow laterals. The exact treatment of these branches varies slightly with the class of bush.

With *Tea* roses the main branches are cut back to a third of their length, and the laterals or side branches to two or three eyes.

The main branches of *Hybrid Perpetuals* are cut to a little over half their length, and the laterals to leave five or six eyes.

With *Hybrid Tea* roses the degree of pruning will depend upon the nature of the growth of the plant, according to whether the rose tends towards *Tea* or to *Hybrid Perpetual* parentage. If the bush resembles the *Tea* class, prune like a *Tea* rose, but if its growth is strong and vigorous, treat it like a *Hybrid Perpetual*. An intermediate plant can have its main branches cut back to a little over a third of their length, and the laterals to four or five eyes. *Pernetianas* are usually treated rather more lightly than this.

The degree of pruning necessary for a *standard* rose is also governed by its class, according to whether the bearing part or crown of the standard is H.P., T. or H.T.

## THE GARDEN IN THE PLAINS

*China* and *Dwarf Polyantha* roses, after the first pruning described above, have no further cutting, except to maintain the shape of the bush and to cut out dead wood, crowding branches, and wispy growth. In the case of *China* bushes it is necessary to remove very old wood in order to encourage new primary growth.

The treatment of *Climbers* consists merely of the removal of dead wood and the necessary thinning out. One or two old rods may be removed from well established plants of several years growth, and new ones trained.

*Ramblers* are pruned according to the class. The *Wichuraianas* bloom on one-year wood and the older wood as well, so that pruning must be modified accordingly, and some of the old wood left to bear flowers. One or two old rods should be cut out each year as others develop to take their place. *Multiflora* ramblers (*Climbing Polyanthas*) bloom only on one-year wood, so that two-year wood may be cut away unless it forms part of the essential frame, or is needed to bear new wood.

## THE PROPAGATION OF ROSES

Roses may be propagated by seed, grafts, cuttings, layers, or by budding. In India propagation by budding is the most common method, although cuttings are used for the stocks for budding and for roses grown on their own roots. Roses are not generally grown from seed.

As described above, in the wild state the rose is constantly renewing itself by throwing out suckers from the base. When a rose is grafted or budded, the suckers from below the graft can be removed for a number of years, but eventually the graft peters out and the briar stock takes charge. For a similar

## ROSES

reason a standard rose does not last many years whether it be a budded plant or one growing on its own roots.

It can be seen that own-root roses have some advantages over grafted or budded plants. They have a longer life and there is no alien stock to assert itself, a great advantage in damp, forcing climates. Actually, however, in practice it has been found that the vigour of the briar stock is needed to get the best results from the average rose, and this makes budding or grafting well worth while in most cases.

### Cuttings

Propagation by cuttings is the form used by most amateur gardeners. The best time for putting down cuttings is in late October or early November, after pruning time. If possible the cutting should have a 'heel' (see the section on 'Propagation by Cuttings' in the chapter on 'Plant Propagation'), but if this is not practicable a shoot 9 inches long, should be cut flat to include an 'eye' nearby.

Wood for cuttings should be one year old and mature. Two or three leaves can be left at the top of the shoot whilst the rest should be removed without damage to the eyes. Place the cuttings upright in a mixture of moist soil with half their length underground, in a situation where they get the morning light but are shaded from the strong midday sun.

When the cuttings have struck they should be removed to a shady bed, in about January possibly, where they are kept until ready for planting out.

### Layers

Layering is sometimes carried out when cuttings do not strike easily, and often with climbers. Choose a suitable branch, which must be pliable and fairly

## THE GARDEN IN THE PLAINS

young, and prepare in the way described in the section 'Propagation by layers' in the chapter on 'Plant Propagation'. The prepared part of the branch is then pegged down into a flower pot, or a large section of bamboo slotted at the sides to take the branch, in a light sandy soil. The layer is kept moist and shaded until it has struck roots, and is then severed from the parent plant.

### Budding

Budding is the most common nurseryman's method of propagation, and is best for the drier parts of India. In Bengal it is sometimes found that the bark of the rose is too tight for successful budding.

The stock for budding must be hardy, easy to propagate by cuttings, and it must have a loose bark. The Rose Edouard answers these requirements and is therefore a favourite rose in India for the purpose, although Briar and *multiflora* roses are also used for stocks.

A cutting is prepared for the stock as follows. Put the cutting down in November as described in the foregoing paragraphs, and in July or August it should be ready for transplanting to a raised bed in an open, sunny situation. In September cut it back to about 6 inches from the ground, after which new growth will appear from the base near the roots. Encourage two or three of these last shoots and cut the original stump to the ground. In early November remove all growth but the strongest basal shoot on which branch budding will take place in either mid-November or December.

For the process of budding you will need a budding knife, which has a bone blade for turning back the bark in addition to the ordinary cutting blade. Some raffia is also necessary, and a small tin of water.

The scion bud is the swelling at a leaf axil of the

## ROSES

plant to be propagated (Fig. 20 (a)), and is best taken from a flowering shoot, cut from the branch with a 'heel' of bark an inch or so long. The leaves are taken off, then with great care the small core of wood is removed from the 'heel' with the tip of the budding knife, without damaging the bud (Figs. 20 (b)

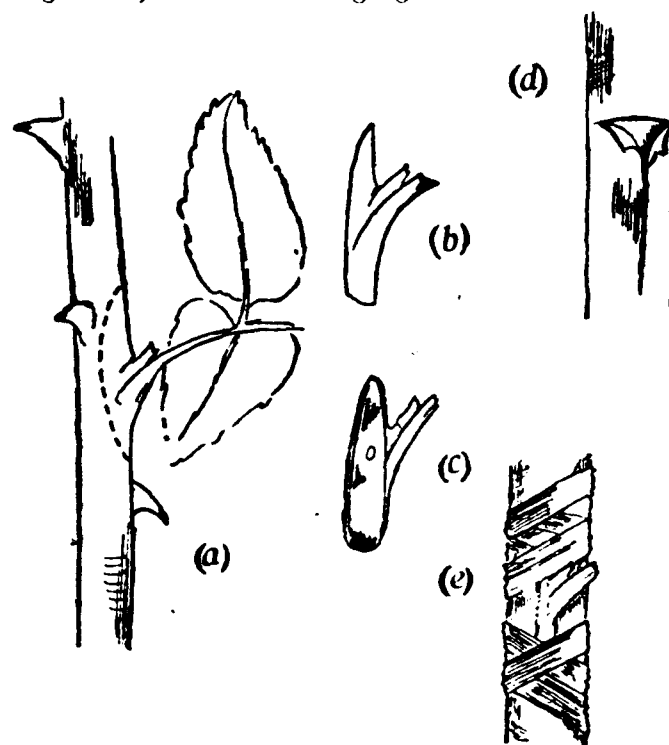


FIG. 20  
THE BUDDING OF ROSES

and (c)). While the bark with the bud is being handled it should be kept moist but not soaked in water. The sooner the prepared bud is inserted into the stock, the better chance the budding will have of success.

In India the bud is often inserted about 3 or 4

## THE GARDEN IN THE PLAINS

inches from the base of the stock. Slit the bark of the stock in a cut about an inch and a half in length, and make a transverse cut at the top end of the slit, thus making a T-shaped cut (Fig. 20 (d) ). These cuts should not damage the wood beneath. With the bone blade of the budding knife, loosen the bark and then slip the shield under the open wings of the bark. Bind up the join with wet raffia, and keep the budded part shaded till union has taken place (Fig. 20 (e) ).

In a day or so, the growing tip of the stock, well above the inserted bud, is cut off. After a few days, eyes below this cut will begin to develop, and these should be removed. This procedure should continue with the object of drawing sap up the stem, past the inserted bud; but the eyes above the bud should never be allowed to take command of the plant. When the bud has grown an inch or so long, which may take two or three weeks, all growth above it should be cut away.

Attention should now be given to the eyes which develop below the inserted bud. These must be rubbed off so that the whole energy of the plant is concentrated on the selected bud.

A budded plant needs shade and some cossetting, and it may be six months or so after budding before it can be transplanted to its final site.

When budding standards, insert the bud on a side branch close to the main stem, high on the stock.

## PESTS AND DISEASES

### Insects

Of the insect pests, the *green fly* or *aphis* is perhaps the most serious. This is a small, active insect, winged and green in colour, which punctures the stems and leaves and sucks the juices. A kerosene or phenyle-kerosene emulsion spray is useful in controlling this

## ROSES

pest, and for recipes see the section 'Piercing and sucking insects' in the chapter 'Pests and Diseases'.

*Saw-flies* sometimes bore into wood, their presence being detected by pellets of saw-dust on the ground. Find the hole that the insect has made and push a wire down it to destroy the inmate. In some cases it is necessary to cut back the affected branch to sound wood.

*Grubs of beetles* may attack the roots, and for these pests, good cultivation and hand collection are the only satisfactory remedies. The same applies to the *rose beetle* which eats the leaves, although a stomach poison spray may be used. (See 'Biting insects that eat leaves' in the chapter on 'Pests and Diseases'.) This pest works mainly at night and collection by lantern light is advised. Here again good cultivation will reduce the ravages of this insect which passes its grub and pupal stages in the soil.

### Fungus diseases

#### Mildew

Of the fungus diseases to which the rose is liable, the commonest is mildew. This appears as a whitish mould on the leaves, especially in damp weather.

Another form of mildew is black mildew, which is shown by dark patches on leaves and stems.

#### Black Spot

This disease shows itself by large patches of purplish brown, and by the falling of the leaves.

#### Rust

Rose-rust is a common disease appearing in the form of rusty-red patches on the leaves. When the whole leaf is affected it falls off.

#### Treatment

All the above diseases respond to spraying with Burgundy, Bordeaux or Lime-sulphur solutions. (See

## THE GARDEN IN THE PLAINS

Fungus sprays and washes' in the chapter on 'Pests and Diseases'.) Should a single treatment prove ineffectual, spray the diseased plants again after an interval of six or seven days. If a few leaves only on one or two plants are affected, these may be dealt with individually by sponging them with a little methylated spirit diluted in an equal quantity of water. Always apply fungicides in the early evening, when the sun has lost its strength.

## THE ROSE GARDEN

### Its layout

Roses look their best bedded on a lawn, although a setting of brick or stone paving is effective, or a combination of lawn and paved path.

Select an open, sunny site but one at the same time protected from wind. The design or layout of the rosary must fit the site, of course. Do not put annuals or other plants in the actual rose beds if both flowers and roses are to be grown in the same plot. There should be quite 3 feet between a rose bed and a bed of annuals.

The arrangement of a rosary is a matter of taste, but great variety is possible with bedding roses, and with the suitable spacing of standard roses, pegged down roses, climbers on a pergola, walls or pillars, or trained along wires.

The Hybrid Perpetual varieties are not free enough bloomers to predominate in an Indian rosary, but a few should be included for they are spectacular pegged down. The majority of plants will be Hybrid Tea, although Tea roses are as suitable.

Climbing roses may be trained over a pergola, if the rosary is large enough to accommodate one. A single pergola consisting of wooden posts or brick pillars, with a chain or treble-woven coir rope looping between them, makes an effective stand for climbers.

## ROSES

Failing this they may be trained along wires, over an archway or as a pillar, the latter being formed in the shape of a pyramid, with a wooden centre pole and wires for the sides down which some of the branches are trained.

### Standard roses

Standard roses may be on their own roots or budded. The stem of the standard should be 3 or 3½ feet high, and the protection of a stake is necessary against wind. Standards may be set off by Dwarf Polyantha roses planted a couple of feet or so from the base of the standard rose, or beds of annual flowers.

In warm, moist climates standards are not very satisfactory as a rule, as the stock is then too vigorous in asserting itself and the bush becomes exhausted quickly. They succeed better in the drier north. Always rub off any embryo shoots on the main stem of a standard. If the bush is a graft these shoots spring from the stock, but even own-root standards should not be allowed to throw from the base. Prune as described in the section 'How to prune' in this chapter.

### 'Pegging down'

When the branches of a rose bush grow more or less straight in the ordinary way, the sap flows strongly to the tips and the flowers are apt to appear there only. If the branches are bent to form an arch, however, eyes along the stem start new growth and burst into flowers. Accordingly 'pegging down' of the branches is a popular method of inducing a show of bloom in some roses. Not every rose lends itself to this treatment, and it is better to choose a heavy growing bush rose like a Hybrid Perpetual for pegging down, rather than a rose of slender twiggy habit.

At pruning time select three or four long pliable

## THE GARDEN IN THE PLAINS

shoots for pegging down, and prune back the rest of the bush in the ordinary way. The ideal branch is about 4 feet long, and just under  $\frac{1}{2}$  inch thick. Hard, old wood is not suitable.

Strong pegs about a foot long are necessary, notched near the top so that the tying material does not slip out of place. Use two or three pegs towards the end of each pegged down branch.

Drive the pegs firmly into the ground at the required places, and bend the chosen branch very gently towards the main stem and over to form an arch, until the ends can be tied to the pegs. If the shoots seem too stiff to bend easily, attach them loosely to the pegs with long strands of raffia, and tighten the strands a little every few days until the tips of the branches meet the pegs.

The season after flowering, cut back the pegged-down branches and choose new shoots to take their places.

### Hedges

Rose hedges are not common on the plains, but they are seen in some of the northern districts. The best roses to use for a bushy hedge 4 or 5 feet high are those of the China class, such as the Old Blush (Monthly rose or Common China) which is pink, Madame Fabvier, red, or Laurette Messimy which is pink. The Japanese *rugosa* roses and their hybrids are also good, such as *R. rugosa rubra*, red, *R. rugosa alba*, white, Parfum de L'Hay, red, Dr Eckner, yellow and Conrad F. Meyer, pink.

A trench must be prepared for the hedge dug  $2\frac{1}{2}$  feet deep and 2 feet wide, with a good layer of rotted cattle manure mixed throughout the lower spit of earth in the trench, and some leaf mould incorporated in the top-soil. The roses are usually planted along the trench in a single line, about 2 to  $2\frac{1}{2}$  feet apart.

## ROSES

The hedge roses mentioned above need shaping into hedge form. China and *rugosa* bushes need very little pruning compared to other bush roses, but when the plants are established it is advisable to cut some of the old wood yearly to encourage fresh primary growth, so that the hedge constantly renews itself. Dead wood must be cut away, of course. *Rugosa* roses sometimes need heavier cutting than do the China bushes, and weak, twiggy growths should be pruned back to about 2 feet. Strong branches only need have the ordinary clipping necessary to control the shape of the hedge.

Tall hedges 6 or 7 feet high can be formed of Climbing or Briar roses trained along wires. Place a row of posts at equal intervals along the bed, joined to each other by four or five strands of thick galvanized wire, well spaced and stretched taut. The roses are trained along these wires and when established pruned until thick. Annually at pruning time cut out one or two of the old rods at yard intervals along the hedge, at different spots each year, so that new growth springs from the base of the plants.

A hedge should consist of one variety of rose, not mixed types. Not only will the ornamental effect be greater, but if the habits of the plants are similar they are easier to shape and control in hedge form. Do not clip rose hedges too often, for then flowering will be reduced.

For a low hedge or substantial edging, Dwarf Polyanthas are decorative. These need little pruning beyond shaping and the yearly clean-out of dead wood and weak or overcrowding branches.

After cleaning up a rose hedge at pruning time, apply a dressing of rotted cattle or horse manure at the foot of the plants.

**Pot planting**

Roses are sometimes grown in pots. Not only are Dwarf Polyanthas good for this purpose, but also Teas like Lady Hillingdon and Mrs Herbert Stevens, and some of the Hybrid Teas which are free flowering but not too vigorous in growth, such as Roselandia, Barbara Richards and Lady Sylvia.

The pots should be fairly big, say about 10 or 12 inches in diameter, drained at the bottom with a 1½-inch layer of potsherds with the hollow sides downwards or with pieces of broken brick. Fill the pots with a special potting mixture to within 1 to 1¼ inches of the rim, so that a certain amount of space is left to hold top dressings of manure later.

*Potting mixture for roses*

- 2 parts soil
- 1 part very old horse or cow manure
- 1 heaped teaspoon bonemeal

Mix together and sift well. The manure used must be very old and decomposed, as it is bad if the roots of newly planted roses come in contact with animal manure which is at all fresh.

If the roots of the roses are too long for the pots, cut them back until they are of the right length, for new fibrous roots will soon appear near the cut. Never cram long roots into a pot too small for them.

Plants can be potted in June and considerable attention is then required. Water should be given two or three times a week and the soil kept from caking, whilst the leaves should be washed or syringed, and diseased ones removed. Flowers will be obtained round about September, after which the soil should be allowed to dry out somewhat and the plants given a clean-up prune to remove the dead wood and twiggy growth. Top-dress with rotted cow manure in November and give water freely. Flowers will appear again

in December, after which rest the plants again, then clean-prune and give a top dressing of manure. The next flowers should be ready in March and April. In June re-potting should take place.

## A SHORT SELECTION OF ROSES

The following brief selection of roses consists for the main part of old favourites known to succeed in most plains districts where roses can be grown. A few of the more recent introductions have been suggested, but spend an hour or so with a rose catalogue which gives descriptions of the newer varieties if you want to experiment with English favourites, or to stock an extensive rosary.

*Bourbon*

Bourbon roses are of long standing in India, and were once commonly seen. The three following are still grown in many gardens.

- PINK — Mrs Paul, blush-white shaded peach  
 Mrs Bosanquet (Maiden's Blush)  
 Souvenir de la Malmaison, blush pink

*Hybrid Perpetual*

These roses should be grown alone and not mixed with Teas or Hybrid Teas in a bed. They are very suitable for pegging down.

- WHITE — Frau Karl Druschki (Snow Queen), pure white, very vigorous
- PINK — Paul Neyron, clear rose pink, vigorous
- CERISE — Ulrich Brunner, scented, vigorous, erect
- CRIMSON — Alfred Colomb, scented, deep colour, vigorous  
 Black Prince, scented, flower large and full, vigorous  
 Hugh Dickson, scented, good shape, very vigorous

## THE GARDEN IN THE PLAINS

### Tea

The following are all hardy on the plains in those districts with a dry cool season, and are suitable for general bedding.

- WHITE OR — Marie Van Houtte, yellowish-cream  
 CREAM Molly Sharman-Crawford, greenish-white, scented  
 Mrs Herbert Stevens, creamy, scented
- PINK — Mamon Cochet, flesh colour, flushed salmon  
 Mrs B. R. Cant, bright silvery rose, full, scented  
 Mrs Edward Mawley, clear pink
- YELLOW — Harry Kirk, clear colour  
 Lady Hillingdon, apricot-yellow

### Hybrid Teas

These make good bedding roses in those districts with a dry cool season.

It is difficult to say which H.T. roses are the most satisfactory in India, for a rose that is disappointing in Bengal, for instance, may flower beautifully in the drier north. The yellow and flame Pernetianas are sometimes difficult, for although the colours are good the flowers often appear sparingly or are thin in form. Those marked with an asterisk \* are hardy in most places where roses can be grown, while those unmarked may succeed better in some districts than in others.

- WHITE OR — \*Everest, large flowers, very vigorous, tall  
 CREAM \*McGredy's Ivory, cream with yellowish base, free flowering  
 \*Miss Willmott, yellowish cream, scented, growth free and branching  
 \*White Ensign, free flowering, sturdy, upright  
 \*Kaiserin Augusta Victoria, creamy white, vigorous
- YELLOW — Golden Dawn, rich yellow, flushed pink  
 Golden Gleam, clear yellow, moderate growth  
 Golden Ophelia, good colour, moderate growth  
 Mabel Morse, golden yellow, scented, vigorous

## ROSES

- Phyllis Gold, lovely yellow, good shape, scented, vigorous  
 Roselandia, apricot-yellow, useful for pots  
 Sunburst, apricot-orange, colour good but variable, vigorous
- PINK — \*Caroline Testout, rose pink, vigorous  
 \*Dean Hole, salmon-carmine, large flowers, vigorous  
 \*Gorgeous, light pink, growth free  
 \*La France, light pink, scented, growth free  
 Lady Sylvia, salmon-pink, useful for pots  
 \*Lorna, peach pink, a beautiful bud  
 \*Madame Abel Chatenay, light carmine-rose, moderate growth  
 \*Madame Butterfly, peach shell-pink, scented, vigorous  
 \*McGredy's Peach, very lovely, fine exhibition rose  
 \*Ophelia, flesh-pink, almost cream, vigorous  
 \*Portadown Fragrance, bright salmon-pink, very fragrant  
 \*Shot Silk, cherry pink shot salmon, vigorous, branching
- COPPER-SHADED — Betty, copper-rose, scented  
 Independence Day (Pernetiana), yellow shaded copper, compact, scented  
 Mrs Dunlop Best, coppery apricot, scented, branching  
 Mrs Sam McGredy, coppery red, delicately scented  
 Mrs G. A. Van Rossem, flame shaded coppery orange  
 Old Gold, orange tinged copper-red, scented, moderate growth
- FLAME — Betty Uprichard, lovely light flame, blooms sometimes thin  
 Irish Elegance (single), light flame  
 Lady Inchiquin, deep flame, growth sometimes weak  
 Madame Edouard Herriot or Daily Mail Rose (Pernetiana)
- BRIGHT RED — \*General McArthur, scented, vigorous  
 \*George C. Waud, scarlet, robust and erect

#### THE GARDEN IN THE PLAINS

- \*McGredy's Scarlet, good colour, delicate Tea scent, growth free
- \*Scarlet Glory, good colour, free flowering, vigorous
- CRIMSON — \*Avoca, tinged with scarlet, scented, vigorous
- \*Daily Mail Scented Rose, velvety crimson shaded scarlet
- \*Etoile d'Hollande, scented, vigorous
- \*George Dickson, scented, vigorous
- \*Grüss an Teplitz, scented, very vigorous, suitable for pegging down
- \*Perfume, scented, growth free, a good button-hole rose
- \*Red Letter Day, crimson shaded scarlet

#### *Dwarf Polyantha or Pompon roses*

These roses are suitable for pot culture, for edgings or low hedges, or for setting off standard roses. In the moister parts of India they may prove disappointing.

- WHITE — Yvonne Rabier, white with yellow centre, dwarf
- YELLOW — Baby Betty, yellow tipped pink
- George Elger, buff-yellow
- Perle d'Or, creamy yellow flushed pink, dwarf
- PINK — Alice Amos, cherry pink with white centre
- Ellen Poulsen, pale pink, tall
- Salmon Spray, salmon pink, vigorous
- RED — Miss Edith Cavell, crimson
- Gloria Mundi, vivid orange-red
- Karen Poulsen, scarlet, tall

#### *Climbers*

These climbing roses succeed in those parts of India with a dry, cool season.

- CREAM — Aimée Vibert (Noisette)
- BUFF — Gloire de Dijon (Tea), scented
- Climbing Elegance (H.T.), good colour, large flowers, scented
- YELLOW — Fortune's Yellow (Noisette), orange-yellow
- Lamarque (Noisette), sulphur-yellow
- Maréchal Niel (Noisette), scented lemon-yellow

#### ROSES

- William Allen Richardson (Noisette), shaded apricot
- PINK — Climbing Caroline Testout (H.T.), carmine-pink tinted yellow
- Climbing Lady Ashtown (H.T.), deep pink
- Climbing Paul Lede (H.T.), shaded yellow
- Climbing Shot Silk (H.T.), bright pink
- RED — Reine Marie Henriette (T.), cherry-red

## Chapter xix

# CHRYSANTHEMUMS

'And 'tis my faith that every flower  
Enjoys the air it breathes.'

—W. Wordsworth

PROPAGATION—Seed—Division—Cuttings—CHRYSANTHEMUMS IN  
POTS—Potting programme—Care of potted plants—DISBUDDING  
—Selecting buds for flowering—Stopping—DIFFERENT FORMS  
—Exhibition flowers—The Decorative class—Bedding plants—  
Cascade chrysanthemums—Notes on some varieties—PESTS AND  
DISEASES—Insects—Fungus diseases—Leaf distortion—A SELEC-  
TION OF CHRYSANTHEMUMS

WHEN we speak of chrysanthemums we usually think of those exotic varieties originally associated with China and Japan, and now highly developed 'show' plants calling for great care and some knowledge in their culture.

The annual varieties usually grown bear no resemblance to the above. They grow freely from seed sown in September or October, and become a fleshy plant about 2 feet in height, with fine lacerated leaves. The flowers appear in the cool season and resemble daisies or marguerites. They are attractive plants which supply large quantities of blooms.

The perennial show or florist's chrysanthemums are divided into several classes: Japanese, Incurved, Reflexed, Anemone, Pompon and so on.

In many districts the climate makes it difficult to grow show chrysanthemums to the best advantage, and a few disappointments are almost certain at first,

## CHRYSANTHEMUMS

but after a season or two of experiment results can be very satisfactory.

### PROPAGATION

#### Seed

Perennial chrysanthemums are easy to propagate from seed, although they may take a long time to germinate and perhaps will not bloom until the second year, whilst only a small percentage may produce flowers which come up to expectations. Those plants which are satisfactory in the last respect should be selected for propagation by cuttings, a process described later.

The seed should be sown towards the end of the rains in seed boxes, with the usual compost for seedlings. When the seedlings are big enough to move they should be put singly into small pots in the 'compost for cuttings', described on page 317. Subsequent treatment is the same as that for cuttings and plants in pots.

Amateurs do not attempt the raising of chrysanthemums from seed as a rule; instead, rooted cuttings and mature plants are bought from nurseries and much time is thereby saved.

#### Division

Division of the rootstock is the easiest form of propagation, and is most often used for bedding chrysanthemums. At the end of the flowering season, the roots of the cut-back plant are taken up and divided, and each separate part, with a sucker, is then planted out in a nursery. By the month of May each division will have rooted and sent out ground shoots. Division is again made and the new pieces planted out in a protected bed or pots, to be replanted again outside in their proper beds in October.

### Cuttings

The chrysanthemum blooms in November and December. When flowering ceases, cut back the plants to within 6 inches of the ground, place the pots in the sun, fork the soil lightly and give water.



FIG. 21. A GOOD BASAL CUTTING FROM A CHRYSANTHEMUM PLANT

Offshoots will soon appear round the plant and these are used as cuttings, those appearing through the soil away from the stem giving the best results. If a large number of shoots appear only the strongest should be chosen for cuttings.

Offshoots about 3 inches long should be taken, cut cleanly just below a joint which is more or less level with the soil (Fig. 21). The leaves from the upper half of the shoot are retained, the tips being cut off if the leaves are at all big. The lower leaves should

be removed carefully. The cutting is now ready for planting in a prepared box, which has a

### CHRYSANTHEMUMS

layer of broken brick or potsherds below the compost.

#### Compost for cuttings

2 parts sand  
1 part leaf mould  
1 part soil

The cuttings are put into holes  $1\frac{1}{2}$  inches deep, and the compost well pressed down. A moist soil is needed, but not direct sunlight.

Cuttings usually root in about a month. When established each little plant is removed to a single pot.

### CHRYSANTHEMUMS IN POTS

A south or south-east aspect is best for potted plants. In common with most other flowers, the chrysanthemum prefers morning to afternoon sun.

Good drainage is essential for potted chrysanthemums, and potsherds or small pieces of broken brick should be placed over the drainage holes below the potting mixture, in a layer 1 to 2 inches deep according to the size of the pot. If there are no stands for the pots, they should be raised off the ground on three bricks or stones.

The potting mixture should not be sieved too finely, as a very fine soil is apt to cake and restrict good root development. Always press the soil down well round the plants.

#### Potting programme

When cuttings have rooted they are transferred to pots and re-potted three or four times throughout the year, each time receiving a compost which is richer than the last. After each potting the plant must be kept in the shade a few days, and in the hot weather protection from the full strength of the sun is necessary at all times.

## THE GARDEN IN THE PLAINS

### *First potting*

About February lift the rooted cuttings and pot them in 3-inch pots, in the following compost:

- 1 part sand
- 1 part leaf mould
- 1 part soil

The roots should be spread out carefully and the soil pressed down well. Give sufficient water, but not too much.

### *Second potting*

About April or May re-pot in 4- or 5-inch pots, with this compost:

- 1 part sand
- 2 parts leaf mould
- 1 part soil

The ball of earth round the root should not be broken, but the plant held in the fresh pot and the compost pressed round the root with its ball of earth. Stake the plants if necessary.

In some cases this second potting is omitted, but as a rule the move is beneficial and checks growth sufficiently to discourage the plants from racing up later in the moist, warm months of the monsoon.

### *Third potting*

In June or July re-pot in 6-inch pots with this compost:

- 1 part sand
- 2 parts leaf mould
- 2 parts soil

Care in drainage and in pressing down the new compost should be taken as before.

### *Final potting*

In August or September re-pot in 8- or 10-inch pots, according to the full size of the variety, with this compost:

- 1 part sand
- 1 part leaf mould
- 1 part well-rotted cow manure
- 1 part soil

When filling the pots with compost, leave an inch at the top so that a top dressing can be applied later should any

## • CHRYSANTHEMUMS

roots become exposed. The plants are now left to flower without further moving.

### **Care of potted plants**

Chrysanthemums are surface-rooting plants, so great care must be taken not to damage any roots by too vigorous or too frequent forking. If roots become exposed, cover them with some earth mixed with a little leaf mould.

When the plants have established themselves after the final potting, liquid manure or slurry given once a week is very helpful while the buds are forming. (See the section on 'Liquid manure' in the chapter 'Soil and Manuring'.) This treatment should be varied by an occasional watering with superphosphate, at the rate of half an ounce per gallon of water, for this also helps flowering and ripening of the wood. Always damp the soil slightly with clean water before applying liquid manures, especially when chemicals are used. When the flowers are about to open all manuring should cease.

The plants should be watered carefully. Usually once every 24 hours in the evening is enough, but in dry, hot weather it will probably be necessary to give water in the early morning as well. If the pot is tapped, it will give a ringing sound if the soil is dry, and a more muffled one if the soil is still wet. Very light surface watering makes for a shallow root system, so it is important to water thoroughly.

Yellow, limp foliage in potted plants is usually an indication of too frequent watering, poor drainage, or lack of light and air, although in the case of bedding chrysanthemums outdoors it may mean sun-scorch or dryness. A good green colour is a fairly sure sign of good health.

In cold weather it is advisable to give water slightly warmed by the sun rather than stone-cold water from

#### THE GARDEN IN THE PLAINS

a deep well. It is also better to water in the early afternoon instead of the evening if cold nights are expected, so that the soil is not soaking wet during the coldest hours.

Plants should be staked when they are 8 or 9 inches high. The stakes should be a few inches longer than the stem to allow for growth, and at each potting a taller stake must be substituted. Exhibition plants with their few stems are easier to stake than Decorative types with many branches. Rather than having a forest of stakes round a Decorative plant, it is better to brace the heaviest stems with 3 or 4 stakes between which and through the plant a network of raffia is threaded with a loop round each branch to be supported. Some growers prefer a light wire frame which is attached to four stakes placed round the plant.

#### DISBUDDING

To get large flowers it is necessary to disbud the plant severely. It must be remembered, however, that although disbudding and manuring increase the size of the flowers considerably up to a point, it is only up to a point, for nothing will make a large Exhibition flower from a small-flowered type of plant. Disbudding varies slightly with the class of chrysanthemum, but speaking generally the following system holds good.

##### Selecting buds for flowering

With bedding chrysanthemums disbudding often amounts merely to the removal of some of the crowding branches. Good plants in pots grown for Exhibition or Decorative purposes, however, need careful and knowledgeable disbudding to get the best results.

#### CHRYSANTHEMUMS

##### *How a chrysanthemum grows*

If a rooted cutting or a seedling is allowed to develop naturally, the single stem will go on growing until a bud forms at its tip, so ending the upward growth of the stem. This bud is usually known as the *break* bud, because on its appearance, the shoots in axils of the leaves on the stem, below the break bud, break into active growth. These side shoots now continue growing and make the plant bushy. When they have reached their full length single buds will appear at their tips also, these being known as the *crown* or *first crown* buds. Some growers do not distinguish between 'break' and 'first crown' buds, classing them both as 'crowns' or 'first buds'. It gives a clearer idea of the phases of the plant's growth, however, if the first bud of all on the single stem is called the 'break'.

The leafy shoots on the side branches surrounding each first crown bud now start growth to become secondary side branches, continuing until they in their turn produce a single bud at each growing point. This bud is called the *second crown*, or 'second bud'.

Finally the shoots along these secondary side branches grow until a cluster of buds appears at each tip. These are known as *terminal* buds, so called because they terminate the plant's vegetative growth for the year. The difference between the terminal bud and the break and first and second crown buds which precede it, is that instead of appearing singly surrounded by growing shoots only, it is encircled by other flower buds which form a cluster (see Figs. 22 (a) and (b)). Once the terminals appear no further growth takes place.

Some chrysanthemums that flower late in the year skip the second crown buds entirely, the secondary

THE GARDEN IN THE PLAINS  
side branches producing terminal buds instead of  
bearing second crowns and sending out new branches.



(a) A crown bud at the end of a shoot, with growing shoots in the axils of the leaves



(b) How a terminal cluster is disbudded when only one flower is wanted on a shoot

FIG. 22

#### Which buds to choose for flowers

The buds chosen for flowers are said to be 'taken'. You might think these would be better called 'left'

[ 322 ]

#### CHRYSANTHEMUMS

for flowering, but if you interpret the term 'taken' to mean 'selected', it makes more sense.

Growers usually select one class only of the four types of bud mentioned above. The break bud is not taken for flowering as a rule because it matures so early in the plant's life.

Whether the first crown, second crown or terminal buds are selected depends largely upon the variety with which you are dealing, and the rate of development of the plant. With certain chrysanthemums the first crown buds are apt to be disappointing in flower and the second crown buds give the best results; but as mentioned already, some varieties do not produce second crowns, and terminal buds appear instead. In India this happens with many chrysanthemums, especially if they are propagated late in the season. In these cases it may be safer not to rely upon second crowns forming, but to 'take' the first crown buds instead. If the variety is one likely to mature very early, however, it might pay to discard the first crown buds in favour of terminals, which form last, and disbud each cluster to leave a single bud only (see Fig. 22 (b) ).

#### The actual 'taking' of the buds

To illustrate the process of 'taking', here follow examples of three plants grown for show purposes. The first is to bear *first crown* buds, the second to bear *second crown* buds, and the third *terminal* buds.

(1) With the first plant, procedure is as follows. When the break bud is forming it is gently plucked or pinched out with the forefinger and thumb, and a given number of the oncoming side shoots just below it are selected to bear the flowers. The unwanted shoots further down the main stem are now gradually plucked out while they are small, starting at the top,

[ 323 ]

#### THE GARDEN IN THE PLAINS

the process being spaced over 5 or 6 days. It is a shock to the plant if all the shoots are removed at once.

The chosen shoots will now grow strongly. As the first crown buds start to form, the shoots round them, which would become secondary side branches, break into growth. As these appear they must be removed one by one, as described above, until the first crown buds are alone at the tops of their stems, so that the whole energy of the plant is concentrated on these buds.

(2) If *second crown* buds are wanted, as in the second example, the plucking out process is carried a stage further. The first crown buds on the side branches having been removed, one of the shoots on the outer face of each side branch, near the top, is chosen to develop and bear flowers, and the rest plucked out one by one. As mentioned before, Nature sometimes springs a surprise with certain varieties, or with plants propagated late in the season, and the secondary side branches may produce terminals instead of the expected second crown buds. When this happens, the only thing to do is to make the best of the terminal flowers by disbudding the cluster, so that there is only one flower at the tip of each branch. If the plants have been watched and the crown buds removed early, second crowns will form in many cases.

(3) Should second crowns appear and you still prefer to have *terminal* buds, as in the third example above, the second crowns must be removed and one shoot on each branch left to grow for flowering. When the terminal clusters appear, the end bud at the centre can be retained and the surrounding buds removed. If left to grow naturally, each cluster of buds will form a spray of small flowers.

#### CHRYSANTHEMUMS

##### *When to expect flowers*

Climatic conditions vary so that it is difficult to say exactly when the buds will start to form. It may take as long as from 2 to 3 months from the time the break bud appears until the plant has developed enough to flower fully. From the time the buds first show faint colour until they open into full flower is usually a matter of several weeks.

##### *Stopping*

'Stopping' a plant means cutting or heading-back the main stem in order to encourage branching below the cut. This device is commonly used with plants to produce a bushy form.

One advantage of stopping the upward growth of the main stem artificially by heading it back, is that the side shoots below become active earlier than if the plant is allowed to develop naturally until the break bud is about to form. The flowering stage is also hastened as a result of this early branching.

In England growers find it necessary to have the right flowers in bloom for exhibitions at a given date, and a system of stopping is a great help in controlling the growth of the plant. The whole process has been worked out to a fine art, and suppliers can help growers by sending exact instructions with the plants as to when to 'stop'. In India, however, climatic conditions are so different that the English instructions generally do not apply.

In India the climate is only too forcing to vegetative growth and so it is not necessary to hurry on the development of the plant. One of the chief reasons for stopping, however, is that the shape of the plant is improved for pot culture. The selected branches spring from low down on the plant if it has been stopped, the final form being well balanced and neat.

## THE GARDEN IN THE PLAINS

### *How stopping is done*

The height of the main stem when the break bud forms, and the length of the side branches when the crown buds appear, vary with the type of chrysanthemum. Stopping or heading-back of the main stem is usually done at a height of 6 or 8 inches, just above

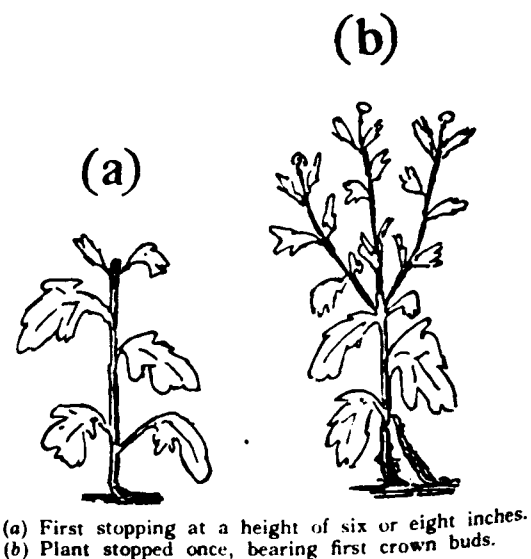


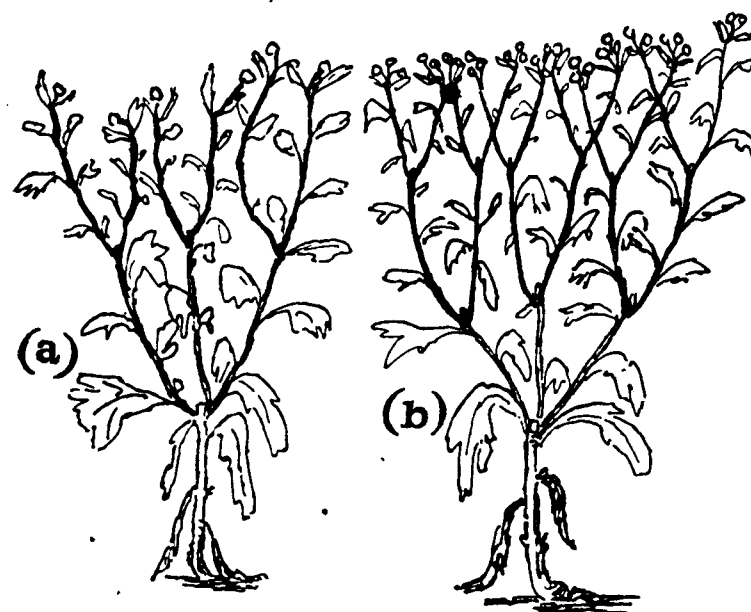
FIG. 23. STOPPING AND DISBUDDING

a leaf. Side branches will soon appear below the cut, and a few of the strongest should be chosen for growing on, at well spaced intervals, and the rest removed. If second crown buds are wanted, these side branches must be stopped again at about 6 inches, and a few of the best secondary branches allowed to develop to bear the flowers, the process being repeated again if terminal buds are preferred (see Figs. 23 and 24).

There is a limit to the number of times a plant may be stopped, this limit being the appearance of

## CHRYSANTHEMUMS

the terminal buds. Those varieties which bear second crown buds can be stopped three times before the terminals appear. That is to say, the main stem can be headed-back, then the side branches, and finally the secondary side branches. Other types which do



(a) Plant stopped twice, bearing second crown buds.  
(b) Plant stopped three times, bearing terminal clusters.

FIG. 24. STOPPING

not bear second crowns as a rule, can only be stopped twice.

Generally speaking, it is safer not to stop a plant more than twice in India, for too frequent stopping often results in small and inferior flowers.

Stopping should never be undertaken just before or just after a plant is re-potted, as the double shock is harmful.

## THE GARDEN IN THE PLAINS

### DIFFERENT FORMS

For convenience sake growers class chrysanthemums according to their form or function. For instance, *Exhibition* plants are specimens produced for flower shows. *Decorative* chrysanthemums are varieties which are very free-flowering, grown for cut flowers or as ornamental pot plants. *Cascade* chrysanthemums are trained to form a shower of bloom. *Bedding* types are hardy plants for outdoor flower borders.

#### Exhibition flowers

Flowers for show purposes are usually raised from cuttings, and carefully grown to produce from one to three or four enormous blooms. These beautiful flowers are the joy of the exhibitor's heart, but many amateurs also enjoy rearing them in pots for a place in the garden.

To grow Exhibition flowers successfully it is essential to understand both the theory and practice of dis-budding.

Show plants are sometimes raised to bear one fine bloom on a single stem. 'On a single stem' does not mean that the first break bud is selected for flowering, for first crown or second crown buds are usually chosen. If crown buds are to flower, the main stem of the young plants can be 'stopped', or else the break bud plucked off as it forms, and one only, the strongest, of the upper side branches just below the cut allowed to grow on and bear the flower. If the plant is properly staked the side branch will grow upwards and the effect is of a single stem.

With some chrysanthemums, the Incurved varieties are an example, a single flower often becomes coarse, and it is better to grow two or three flowers on a plant so that there is a wider distribution of food materials.

If three or four flowers are to bloom on one plant,

## CHRYSANTHEMUMS

three or four branches must be chosen, well spaced, to bear the flowers. Always choose the strongest shoots on the outside of the branch, as near the top as possible. If the plant is carefully staked the branches will grow up instead of outwards.

Flowering can be delayed a short time if some of the shoots round the chosen buds are allowed to grow a little. These shoots should not be allowed to take charge, however, and they must be pinched off before they get too big.

If you intend to exhibit at a local show, it would be as well to get a book wholly about chrysanthemums, for there you will find tips for exhibitors, details about staging the plants and so on.

#### The Decorative class

This is a large group comprised of the especially free flowering varieties of the Japanese, Incurved, Anemone, Pompon and Single classes. They can all be disbudded to produce a moderate number of medium-sized blooms, while many of them look delightful when grown to bear small flowers in sprays. Decorative chrysanthemums are cultivated mainly for cut flowers or as ornamental pot plants, and they are the best group to grow in the average garden, for they are not quite so much trouble to raise as the Exhibition types.

#### Disbudded blooms

Disbudded Decorative chrysanthemums are usually grown to produce from 8 to 16 flowers on a well balanced, bushy plant. Although the drastic disbudding necessary for Exhibition flowers is not required, the whole process of disbudding must be clearly understood.

The break bud is removed, or the single stem stopped at 6 or 8 inches, and as many strong branches

## THE GARDEN IN THE PLAINS

as the plant produces allowed to grow on, while weak or crowding branches are removed. The number of branches a plant will send out depends partly on the variety, but also upon how early in the year the cutting was put down. If first crown buds are chosen to flower, the branches must not be allowed to shoot further. If second crowns are preferred, these branches can be stopped at 6 inches or the first crown buds pinched off as they form, and well spaced shoots allowed to develop and bear flowers.

*Bush or Spray-flowered forms*

Rather than produce medium-sized blooms as described above, it is sometimes preferred to grow bushy plants with sprays of small, dainty flowers. The Anemone, Pompon and the smaller-growing single varieties are especially suited to the spray-flowered form, and make a fine show.

As a rule the plants are allowed to flower naturally without disbudding, the single stem being stopped at 6 or 8 inches to induce a bushy form. As many strong branches as the plant produces should be kept, provided they are well spaced. If, however, crown buds are disbudded so that the terminal clusters only are allowed to bloom, the result is a well-ordered plant with fine sprays of flowers. The centre terminal bud at the end of the cluster often flowers before the other buds round it. If you do not want this to happen, the end bud can be pinched off and the rest left to bloom together.

**Bedding plants**

Some of the hardiest Japanese double or single types and the Pompon chrysanthemums do well in beds outdoors during the cool weather. They may be propagated by cuttings or division, and put out in a shaded nursery.

From the nursery the plants are put out in their final beds in October. The beds in the garden must be dug deeply and treated with rotted cattle manure some weeks before the planting season. The plants should be placed 18 to 24 inches apart, with the soil pressed down firmly round them. Staking is necessary.

Liquid manure or slurry (see the section on 'Liquid manure' in the chapter 'Soil and Manuring') may be given weekly as the buds appear, varied every now and then by watering with half an ounce of superphosphate to a gallon of water. Always water the ground with clear water before applying liquid manures.

The plants are usually allowed to flower naturally, but if specially good flowers are needed for cutting, they must be disbudded on the lines of the Decorative group, as described earlier in this chapter.

In the hills perennial bedding chrysanthemums of a rather woody nature are popular for the herbaceous border, or for growing in tubs. Examples are the chrysanthemums *hallerii*, *frutescens* and *anethifolium* with yellow or white daisy-like flowers and finely cut foliage. There is also *C. leucanthemum*, the Ox-eye or Shasta Daisy, a soft-wooded plant having large white flowers with brown or yellow centres. These are seldom seen at low elevations, however.

**Cascade chrysanthemums**

These varieties have been introduced fairly recently, and are very free flowering, bearing small single flowers. They can be grown as ordinary bushy plants to bear flowers in sprays, but they are seen at their best when trained to hang downwards in a shower or 'cascade' of bloom.

In the early stages cascading plants are reared in much the same way as other chrysanthemums, by

## THE GARDEN IN THE PLAINS

seed or by cuttings. At a height of 5 or 6 inches the stem is stopped, and the branch at the top, nearest to the cut, is chosen to form the main shoot of the cascade. The branches below this are headed back when they have 4 or 5 leaves, and each branch that forms on them stopped again, so that the foot of the plant is thickly clothed.

The main shoot of the cascade is allowed to grow and when it is 9 or 10 inches high training begins. A thin and pliable metal rod is generally used for the purpose. One end of this is buried in the pot, and the rod bent over and downwards at an angle of 45°. This rod must be attached to one or two short, strong stakes in the pot so that it keeps in position. The main shoot of the plant is fastened to this support and trained along it.

Side-shoots will appear along the main stem, and these can be pinched back once so that the cascade has a good form, provided the plant has been propagated early in the season.

At the close of the monsoon the support is bent again so that the cascade hangs straight down from the pot. If the stem seems too stiff or brittle to bend further, water should be withdrawn for a few days so that it wilts slightly and becomes pliable enough to bend. While rearranging the rod, the weight of the cascade must be supported and the stem lowered gradually into the new position, taking several days over the process, so that it does not snap.

The pots containing the plants should be placed on some high place in order that the shower of blooms may be seen to full advantage.

### Notes on some varieties

#### *Japanese chrysanthemums*

These form a large class which includes the

[ 332 ]

## CHRYSANTHEMUMS

double varieties with shaggy heads, quilled petals, and so on. They are usually grown for exhibition purposes, although the hardier free-flowering varieties are useful members of the Decorative group.

### *Incurved and Reflexed forms*

Incurved chrysanthemums have petals arranged very neatly and curving upwards and inwards, the effect being like a tight ball of petals. The Reflexed forms have the petals curving downwards. The flowers are always disbudded, but there should be several blooms on a plant, as a solitary flower is apt to become gross and perhaps distorted if too much energy is concentrated upon it. Many growers believe that over-feeding produces poor results, and that animal manure is not desirable. Instead of liquid cow manure they recommend a weak solution of superphosphate.

### *The Single class*

Many of this group can be grown outside as bedding plants, while others are better potted. The tall-growing varieties can be disbudded to produce wide single blooms, but the smaller types are usually grown to bear sprays of dainty little flowers. The single class should not be over-fed, otherwise the foliage is apt to eclipse the flowers.

### *Anemone-flowered types*

These have raised centres, a shade or so lighter than the surrounding petals in colour, and are very decorative. They can be disbudded, but are most often spray-flowered in form.

### *Pompons*

These plants bear tiny little round flowers, usually produced in sprays. The plants are generally only a foot or so high, and are bushy in form. Excellent

[ 333 ]

## THE GARDEN IN THE PLAINS

for cut flowers, and hardy enough to grow outside in beds during the cool months.

### PESTS AND DISEASES

#### Insects

*Aphids* and *green fly* attack the plant at the growing points and cause curling of the leaves. A tobacco spray or kerosene emulsion, as suggested in the section 'Piercing and sucking insects' in the chapter on 'Pests and Diseases', is helpful.

*Caterpillars* sometimes eat the buds and young shoots, and these must be collected and destroyed. The plants can be sprayed with a stomach poison (see 'Biting insects that eat leaves' in the chapter 'Pests and Diseases').

White *maggots* often attack the roots and as a result the leaves appear sickly and yellow. In such cases the plant must be taken up and the soil renewed.

#### Fungus diseases

*Mildew* and *rusts* attack the plants sometimes, especially if the pots are not kept in an airy situation. The diseased plants should be treated by spraying with lime-sulphur or Bordeaux solution. If the disease is too slight to warrant the expense and trouble of getting these sprays, sponge the affected leaves with a little methylated spirit diluted with an equal quantity of water.

Sometimes the leaves damp off and the lower leaves die, usually indicating a lack of drainage. This should be remedied as soon as possible, and the plant sprayed with Bordeaux mixture if there is any at hand.

#### Leaf distortion

Occasionally chrysanthemums have a whorl of distorted leaves appearing in a dense mass near the

## CHRYSANTHEMUMS

tops of the stems. This is a physiological trouble, and the leaves should be removed for if they are allowed to remain any flowers produced will be poor.

### A SELECTION OF CHRYSANTHEMUMS

#### Japanese

- WHITE — Louisa Pockett, white tinged pink  
William Turner, pure white
- YELLOW — Boule d'Or, deep yellow flushed bronze-red  
Majestic, golden amber
- MAUVE — Miss Lilian Hall, lilac
- PINK — Mrs Algernon Davis, a pretty shade
- RED — Hugh Mitchell, deep red  
Pockett's Crimson, a lovely shade  
Red-Majestic, terra-cotta

#### Incurved

- WHITE — Percy A. Dove, pure white
- YELLOW — Romance, golden yellow
- MAUVE — Progress, silvery mauve
- PINK — Coralie, shell pink  
Mrs Sydney Dove, silvery pink
- RED — Captain Kettle, crimson with buff reverse

*Single, large-flowered* (grown with 8 to 10 blooms per plant)

- PINK — Healesville Beauty, pinkish-buff  
Pictor, blush-pink
- RED — Roupell Beauty, wine-red

*Decorative* (both double and single flowered types)

- WHITE — Blanche du Poitou, ivory
- YELLOW — Comus, warm yellow, disbudded or spray-flowered  
December Gold, deep yellow, disbudded  
Golden Seal, deep yellow, disbudded  
Mrs Edwards, yellow tinted bronze, disbudded  
Winter Sun, amber, disbudded

- THE GARDEN IN THE PLAINS**
- BRONZE** — Cherub, spray-flowered  
 Jean Pattison, copper-bronze, disbudded or spray-flowered
- PINK** — Balcombe Pink, disbudded  
 Caprice du Printemps, rose-pink, spray-flowered  
 Fifi, spray-flowered  
 Heroine, peach-pink, disbudded or spray-flowered  
 Miss Joan Higley, salmon tinted bronze, spray-flowered  
 Miss Eva Hudd, chestnut-scarlet, disbudded  
 Winter Cheer, deep pink, spray-flowered  
 Crimson Conquest, scarlet-crimson, disbudded  
 Red Admiral, bright terra-cotta scarlet, disbudded or spray-flowered  
 Splendour, chestnut-red, disbudded or spray-flowered

- Anemone-flowered* (usually spray-flowered)
- YELLOW** — Golden Nymph, straw-gold with deeper centre
- MAUVE** — Elspeth, pale mauve tipped gold
- PINK** — Aphrodite, mauve-pink  
 Barbara Hilberry, salmon-beige  
 Heloise, salmon-pink
- RED** — Winsome, crimson

*Bedding chrysanthemums*

- WHITE** — Reine des Blancs
- BRONZE** — Harry Thorpe, bronze-yellow  
 Mrs Q. Macfadyen, light gold-bronze  
 September Glory, orange-bronze
- PINK** — Rose Précose, bright rose
- RED** — Mayford Red, crimson with yellow reverse

*Pompons*

- ORANGE** — Prince of Orange
- BRONZE** — Thanksgiving Gem
- MAUVE** — Lilian Doty
- PINK** — Mlle Elise Dordans, silvery-pink
- RED** — Crimson Perfection  
 Ethel, bright red

*Cascade*

- WHITE** — Kuan Yin  
 Nerissa
- YELLOW** — Celandine
- BRONZE** — Romeo
- PINK** — Granesbill  
 Yosemite

## Chapter xx

### CANNAS

'Pure colour is rest of heart.'

Preparing the beds—Planting—Watering and after-treatment—Resting and re-planting—Cannas in pots—Diseases—Types of cannas—A SELECTION OF CANNAS

CANNAS provide a fine medium for massed colour effects, and in a new garden they are invaluable as a means of filling up corners with a quick return of bloom. At first it is a good plan to fill in odd places with small clumps until the cannas have multiplied sufficiently to need large beds to themselves; then plan bold colour schemes.

The plants are apparently easy to grow but they have very definite requirements, and if these are not attended to the flowers become thin and tattered. On the whole it is more effective to keep the colours separate in large beds than to mix them, but the creams, salmon-pinks and apricots blend well, as do the reds, flames and orange yellows.

#### Preparing the beds

Cannas are greedy feeders and in this respect need a lot of attention. The soil in the bed must be dug thoroughly 20 to 24 inches deep, and a layer of half-rotted cattle manure, 4 to 6 inches deep, should be spread over the surface of the dug bed and well mixed throughout the loose soil.

When making beds see that they are slightly raised in the centre, to get the maximum show effect

[ 338 ]

### CANNAS

from the blooms. In the same way, a bed which lies along a wall or fence should be sloped very slightly, ramp-like, up to the wall, just steeply enough to give a clear view of the flowers at the back.

#### Planting

The best time to plant cannas is at the beginning of the rains, although they can be raised at all times with adequate watering.

If a clump of cannas is to be divided, cut the flower stems down to within an inch or so of ground level, then lift the clump and divide it into several pieces, each piece consisting of a good-sized rhizome and a bit of short stem. Plant the rhizomes 2 feet apart, triangularly, each buried about an inch below the soil with the growing point upwards, as shown by the piece of short stem left attached to the rhizome. Water the bed and shade it with some leafy branches until new leaves appear, and then remove the shade.

#### Watering and after-treatment

Newly planted bulbs should be watered sparingly at first, but copiously once the new leaves appear. These flowers do not like stagnant moisture but appreciate deep watering. If you have no hose, it is better to take off the rose or nozzle of the watering-can and to let the water penetrate the soil in a steady stream, rather than sprinkle the surface of the ground through a rose. A thorough soaking every fifth or sixth day is sufficient except in very dry weather. Fork the surface of the bed the morning after a soaking.

Never let a seed pod form, but cut off each flower as it dies, and jerk down or cut each stem at the base when the whole head has finished flowering. Keep the ground clear of weeds and friable by forking the bed frequently.

[ 339 ]

## THE GARDEN IN THE PLAINS

In the way of after-treatment, a thin layer of cattle manure should be turned into the soil at the beginning of the cold weather in late October or November.

In districts with a heavy rainfall cannas in heavily manured beds sometimes grow very tall, and the flowers are dwarfed by the heavy foliage. If this happens, omit the dose of manure in November, and halve the amount added to the beds when re-planting at the beginning of the rains.

### Resting and re-planting

At the beginning of the rains each year cannas should be dug up and the clumps divided, the roots being re-planted after the beds have been dug well and heavily manured.

In districts with a heavy rainfall it is important to aerate the beds by digging them deeply and leaving them empty for a week or two towards the end of the dry weather while the canna roots are left under a shady tree or some other cool place. The plants will benefit by this short resting period. Re-plant the cannas in the manured beds with the early rain, after dividing the clumps.

Cannas which have been in the same place a number of years will benefit greatly from being re-planted in new beds. The old beds can be grassed over, or manured and used for annual flowers the following cold weather. If it is not practicable to cut new beds for the plants, it is as well to mix some fresh soil with the earth in the old beds every few years.

### Cannas in pots

Cannas in pots make a bright decoration for a sunny veranda, and they can be brought into the house to form a spectacular setting for a dinner

## CANNAS

party, although they will sicken if kept indoors for longer than an occasional evening.

Big earthenware pots are necessary: failing these, kerosene tins painted green on the outside and the bottoms pierced liberally with holes will do. Spread a 2-inch layer of potsherds, or pieces of broken brick, over the drainage holes before filling the pot or tin with the potting mixture.

### Potting mixture for cannas

2 parts rotted stable manure  
1 part soil

The cannas should be potted at the very beginning of June, and again in September if the clumps are becoming too big for the pots. At the second potting thin the clumps.

### Diseases

Cannas are not prone to many diseases. If the leaves look yellow or the plants stunted, it is usually due to poor drainage or inadequate manuring. Caterpillars sometimes attack the leaves, and these should be hand-collected and the leaves sprayed with a stomach poison. (See the section 'Biting insects that eat leaves' in the chapter on 'Pests and Diseases'.) If the leaves are brown and withered at the edges they are best cut off and burnt. Occasionally grubs eat the centres of the flowers, in which case the infested flower heads should be removed and destroyed.

### Types of cannas

People often assume that there is only one kind of canna, whereas there is wide variation in size and form. Some kinds have deep bronze leaves, some grow tall, others are dwarf. There are several distinct groups of flowers. The gladiolus or Crozy

## THE GARDEN IN THE PLAINS

class is one well-known type, with firm petals and large heads; and the orchid-flowered canna, with big rather limp petals and a disappointing head is another. There have been many crossings resulting in spectacular colour combinations and fine flowers. The Dreadnought type has huge heads and is commonly seen in Calcutta. There are delightful dwarf cannas not exceeding 2 feet in height, and cannas with branching candelabra heads.

Most horticultural gardens have their own special lines and will send you a list of types with names and descriptions.

### A SELECTION OF CANNAS

- RED** — Black Knight, deep crimson with bronze leaves  
Lord Reading, crimson scarlet  
Lord Willingdon, bright tomato red  
Statue of Liberty, flame red, bronze leaves  
The President, rich scarlet
- ORANGE** — Copper Giant, rose-orange  
Orange Glory, orange terra-cotta  
Orange King, golden orange  
Sunset, orange terra-cotta
- YELLOW** — Debutante, clear yellow  
Golden Glory, lemon  
Masterpiece, salmon-yellow  
Percy Lancaster, yellow spotted scarlet
- PINK** — Alipore Beauty, rose pink  
Doris, pale salmon pink  
Queen Mary, rose shaded salmon, with cream edges  
Rosea gigantea, carmine-rose
- CREAM** — Ivory Child  
Mount Everest  
Radio

## Chapter xxi

### ORCHIDS

'People who cannot feel magic persist in believing that gardening is all weeding and manuring—all digging and backache, and so they miss the lights of fairyland.'

—Marion Cran: *Wind Harps*

Where orchids grow—How orchids grow—Temperature, sun and shade—Propagation—Culture of epiphytic orchids—Terrestrial orchids—Watering orchids—A SELECTION OF ATTRACTIVE ORCHIDS

PERHAPS keen orchid growers in India were encouraged originally in their hobby by the fact that they lived in or near a district where these plants grew naturally. If orchids can be obtained easily from the jungle the plant is detached or dug up and transferred to the garden; or the actual branch carrying the orchid is taken.

The habits of orchids vary so widely that no hard and fast rules can be laid down that apply to the treatment of all types. It must be stressed that the following notes are of a very general nature, and a person deeply interested will pursue the subject much further.

#### Where orchids grow

Orchids are found in most parts of the world except the very dry or very cold regions, but the majority are tropical or subtropical plants. In India orchids grow freely in the jungles and hills of Assam and North Burma, the lower slopes of the Himalayas, and

#### THE GARDEN IN THE PLAINS

the highlands of the South, while Ceylon is more suitable for them. Suitable varieties will succeed in Bengal, Sylhet and such places, and in some parts of South India, but in the dry northern districts it is generally useless to attempt their culture.

#### How orchids grow

Orchids are divided into two main classes, epiphytic and terrestrial or ground orchids. Epiphytic varieties grow on trees or rock faces and their thick, fleshy roots are exposed. Terrestrial orchids grow in the soil with a tuber or rhizome and roots under the ground. Most of the temperate varieties are terrestrial and some fine tropical orchids belong to this class. Both types of orchids are perennials and have a dormant, resting period.

The epiphytes have a curious root system. Some roots are used for attaching the plant to its support, whether tree or rock. Epiphytic orchids are not parasites; that is to say, they do not actually get their food from their host or support. The clasping roots are able to absorb moisture running down the surface of the support, however, as well as plant food in solution from decayed vegetable matter. Some orchids have aerial roots that hang down from the plant in addition to those that cling to the support, and these are able to manufacture food from air and moisture. Many orchids store food and moisture in *pseudo-bulbs*, small swellings or growths which spring from their stems.

In places which have a long dry period the indigenous orchids are equipped to face it, and if these kinds are brought to a climate which is perpetually moist they may deteriorate. Similarly, orchids found in constantly moist localities need special care if transferred to a district which has a long and marked dry season, and the humid conditions in which they

#### ORCHIDS

thrive must be reproduced artificially. It will be seen, then, that an orchid will be found easy to grow if the climate of the district where you propose to grow it approximates to that of its natural home. In all parts of India there is a comparatively dry period after the monsoon, although the heavy dews or early morning mists of the cool weather supply a certain amount of moisture.

The growing period for orchids is in the rains, and they are dormant in the cool, dry months. Many types flower in the spring, others later in the summer.

#### Temperature, sun and shade

Orchids vary considerably in the temperature they require. Some like cool conditions, others prefer a medium dry climate, and a third class needs a moist, warm atmosphere. As regards light and shade, some orchids can stand more light than others, a few thriving in full sun. Speaking generally, orchids like the early morning sun but need shade in the hottest hours.

Whilst an expert can grow a wide variety of orchids under controlled conditions, the ordinary gardener on the plains should start with a few indigenous varieties collected at as low an elevation as possible. The plants are best raised in a fernery, or on trees in the garden if conditions are ideal.

#### Propagation

Orchids may be propagated by seed, which in most cases requires special treatment before it will develop and form a plant, as well as expert knowledge and experience.

Most orchids may be reproduced by division of the rootstock, or from the pseudo-bulbs with some roots attached. Some species produce plantlets on the old mature pseudo-bulbs, and these may be

#### THE GARDEN IN THE PLAINS

rooted on to small balls of coir fibre or dry moss and when the roots have attached themselves the plantlets can be severed from the parent plant. When buying orchids ask your supplier about the methods to employ for particular plants if you want to specialize in their culture. The best time to attempt propagation is towards the end of the dormant period or in the wet season after the plants have flowered.

#### Culture of epiphytic orchids

It is possible to grow epiphytic orchids on garden trees in those districts where the climate is suitable, but as a rule it is better to house the plants in a fernery in pots, in hanging baskets or on wooden logs or floats.

#### Orchids on trees

The best trees to support orchids are those with a rough bark and forked branches, giving moderate shade. Trees throwing very dense shade or with a smooth bark are not suitable.

The clinging roots of the orchid are spread round a branch so that eventually they clasp it. The plant is kept in position on the tree by tying a few strands of coir fibre bound over the roots. A very thin layer of old matted fern roots or dry moss is sometimes spread over the roots beneath the binding fibre. This is partly to protect the tender young roots, but also to retain moisture for them. Too thick a covering is a mistake as it is apt to prevent good root formation.

#### On logs or floats in a fernery

Orchids are often attached to small blocks of wood, or 'floats' as they are generally called, slung from the roof of the fernery. These floats usually consist of pieces of teak wood, sawn into short lengths

#### ORCHIDS

each  $1\frac{1}{2}$  to 2 inches thick. The floats are charred on one side, and the roots of the orchid spread over that side and covered with a thin layer of old matted fern roots or dried moss, bound on with a few strands of coir fibre. Do not choke the plant with too thick a layer of fibrous material.

#### In pots

Sometimes porous earthenware hanging pots perforated round the sides and underneath are obtainable, and these are excellent for orchids in the fernhouse. Often ordinary earthenware pots are used, raised on supports above the ground so that air can pass beneath them.

#### Compost for potting epiphytic orchids

- 1 part broken bone, cleaned and dried
- 2 parts charcoal, in small lumps
- 1 part broken brick, in fairly small pieces
- 1 part old coconut husk, broken in pieces
- 1 part peat, if available, or else decomposed fern roots or dried moss

Each pot should have a layer of potsherds with the hollow sides downwards spread over the drainage holes at the bottom. On the top of the potsherds spread a thin layer of peat, decomposed fern roots or dried moss. Mix the pieces of charcoal, bone, broken brick and coconut husk together and fill the pot with this mixture.

The potting mixture should be level with the rims of the pots at the sides, but about an inch higher in the centre, forming a small mound. The orchid to be potted is mounted on the top of this heap, with the longer root hanging down buried in the potting mixture and the rest spread over the surface. Care must be taken that no pseudo-bulbs are buried or bruised. A thin layer of peat, decomposed fern roots or dried moss is then spread over the exposed roots to protect them until they are established, and to retain moisture. This dressing must not be at

## THE GARDEN IN THE PLAINS

all thick, and is sometimes dispensed with altogether once the roots have gripped the potting mixture.

### Re-potting

The orchids should not be disturbed unless the roots fill the pots or the compost becomes stale or sour. Usually orchids only need re-potting every third year or so.

Do not lift an orchid for re-potting until signs of new growth appear. Pick out the loose, old compost, being careful not to disturb the pieces grasped firmly by the roots of the orchid, and replace the old material with fresh potting mixture.

### Bamboo hanging baskets

An effective hanging basket is made by taking a section of a large bamboo and halving it lengthwise to include a node at its lower end, forming a kind of scoop which when hung upright will house the potting mixture. Several holes should be pierced at the bottom of the scoop for drainage purposes. A thin layer of dried moss or matted fern roots bound on with a strand or two of coir will help to keep the potting mixture and the orchid in place.

### Terrestrial orchids

Ground orchids such as *Arundina bambusifolia* or *Spathoglottis plicata* can be grown outdoors in moist districts, provided the soil is suitable and the situation protected. Ordinarily they are grown in the fernery, housed in porous pots or perforated kerosene tins, with a compost as follows.

#### Compost for terrestrial orchids

- 1 part decomposed farmyard manure
- 1 part leaf mould
- 1 part soil
- 1 part clean fine sand
- 1 part small pieces of charcoal

[ 348 ]

## ORCHIDS

The re-potting of terrestrial orchids is best done when the first signs of new growth appear.

### Watering orchids

Drainage must be thorough if the plants are to thrive. Epiphytic orchids grown on logs or floats will tolerate heavier watering than those in pots or tins. Speaking generally, when watering orchids under cover it is as well to follow natural conditions as closely as possible. That is to say, the orchids should receive most water in the growing period which corresponds with the warm rainy season out of doors. At this time water is necessary every day and is best given in the late afternoon. During the resting period in the dry, cooler weather, treatment must be adapted to the type of orchid. Plants with moisture-storing equipment need little direct watering, but even so the pseudo-bulbs must not be allowed to dry up. In the cool dry weather heavy dews or early morning mists provide some degree of moisture, and these conditions can be duplicated in the fernhouse by syringing walls and floor with water every morning and evening. Orchids that are at home in a perpetually moist climate need regular direct watering when the surface of the compost looks dry, in addition to a moistened atmosphere morning and evening. After flowering it is sometimes advisable to withdraw water for a little, so that the plants have a short rest. In very hot and dry weather all orchids should be watered whenever the potting mixture looks dry. Clean the foliage periodically with soap and water.

## A SELECTION OF ATTRACTIVE ORCHIDS

### Some epiphytic varieties

*Aerides affine* has rose-coloured flowers. *A. odoratum* has white flowers dotted pink, fragrant.

*Vanda coerulea* has long flower sprays in a lovely shade

[ 349 ]

#### THE GARDEN IN THE PLAINS

of blue. It can be disappointing in that it often fails to bloom the second year and the plant sickens. *V. teres* has rose and yellow flowers. *V. spathulata* has flowers of a bright yellow, and is suited to fairly dry districts.

*Dendrobium aggregatum* has clusters of deep orange flowers. *D. parishii* has rosy-purple flowers. *D. dalhousieanum* has yellowish-pink flowers. *D. wardianum*, white, purple and yellow flowers.

*Rhyncostylis retusa* (*Saccolabium guttatum*), or fox-tail orchid, has cylindrical sprays of white flowers spotted purple. Will grow in moderately dry districts.

#### A few terrestrial orchids

*Arundina bambusifolia*, pale pinky-mauve flowers, stems two to three feet high.

*Phaius maculatus* has yellow flowers; *P. wallichii*, dull orange flowers.

*Spathoglottis plicata*, mauve flowers; *S. veitchii*, yellow flowers.

*Thunia alba*, white flowers.

#### PART FIVE

### VEGETABLES AND FRUITS

## VEGETABLES

‘I love tomatoes, hot from the sun, and the crisp  
feel of lettuces with the dew on them . . .’

—Beverley Nichols: *A Village in a Valley*



Choosing the site and preparing the beds—Rotation of crops  
—Seeds—Planting—Staking tall or climbing plants—Blanch-  
ing—COOL SEASON VEGETABLES—Herbs—Mushrooms—COUNTRY  
VEGETABLES—Condiments

IT is sometimes said that there is no particular advantage in growing vegetables in a private garden if there are markets nearby that can supply them regularly. This is probably true from the monetary standpoint, but from the point of view of flavour and health there is no comparison between slightly stale bought vegetables and those fresh from the ground, grown under your own supervision. In town gardens there is seldom space for a large vegetable plot, but if there is any room at all at the back of the house a few beds should be prepared for salad vegetables such as lettuce, tomato, cress and radish, for if these are to be eaten raw it is much safer to grow them at home, under your eye, than to buy them elsewhere. In country places people often have to rely entirely upon home-grown produce.

All vegetables, whether grown at home or bought in a market, should be washed in a pink solution of permanganate of potash, and rinsed in boiled and filtered water. This is particularly essential for salad vegetables which are eaten raw.

## THE GARDEN IN THE PLAINS

### Choosing the site and preparing the beds

Any spare plot of ground can be used for vegetables provided it is not low-lying and liable to flooding, and there are no large and shady trees with competing roots nearby.

It is a good plan to grow a tall hedge on the side from which the prevailing winds blow; in fact a hedge all round is nearly always desirable to screen the plot from the rest of the garden. The vegetable beds, however, should be 5 or 6 feet away from the hedge.

There must be water available in or near the vegetable garden. Should the supply be unrestricted, irrigation channels cut at a gentle slope will carry the water to all parts of the garden.

Beds are usually about 4 feet wide running lengthwise north and south, with small paths between them. Those used for early sowing, before the monsoon has ended, should be well raised. All the beds must be thoroughly dug to a depth of 18 inches and a layer of some sort of bulk manure turned in well in advance of the sowing season. Care must be taken that the manure is evenly mixed throughout the dug soil. Too rich top-soil with poor and uncultivated earth beneath makes for poor root formation, and root vegetables in particular will split and fork in such a bed.

### Trenching

Beds for peas, asparagus, and so on, must be properly trenched. This means that a bed 18 inches wide must be dug 2 feet deep, the loose soil removed keeping the top spit separate, and the ground at the bottom of the trench forked. Replace 12 inches of the bottom soil, and on top spread a thick layer of compost or rotted cow manure, and mix it well with

## VEGETABLES

the earth beneath. Replace the top spit of soil mixed with a thinner layer of manure. This method of mixing the manure ensures rich food for the plants at a good depth.

### *Green manuring the vegetable garden*

It is sometimes difficult to find enough manure or humus for the whole compound, and an economical way of improving the soil of a vegetable plot is to give the ground a rest from cropping in the hot months, and to grow a green manure which when hoed in will provide organic matter for the earth. A good plan is to green manure half the plot each hot season, leaving the other half vacant for special hot season vegetables and early winter varieties.

Green manures are quick-growing leguminous plants which should be cut down just before flowering, and their leaves and lighter stalks buried in the soil to rot and form valuable humus and organic matter. A full account of green manuring, the advantages, methods of planting, and so on, will be found in the section 'Green manure for the vegetable garden' in the chapter on 'Soil and Manuring'.

### Rotation of crops

The type of crop any one bed carries should be changed from year to year; in other words there must be crop rotation, for in this way the soil bears plants which make different demands upon it each season. It is as well to grow vegetables in blocks of several beds, one block carrying leafy plants, another root crops, and a third peas and beans. Next year the plot which carries leaf will carry roots; that which carries roots will be sown with peas or beans; that which has peas or beans will be planted with a leaf crop. The following year another move round will take place, and so the cycle continues.

## THE GARDEN IN THE PLAINS

### Seeds

It is usually advisable to buy imported English or American seeds for the cool season from a reliable seedsman each year. In many cases plants grown from acclimatized seed deteriorate markedly. Indian corn (maize) does well from acclimatized seed, also early maturing cauliflower, peas, onions and beetroots.

Collected seed should be quite ripe and dry before storing in airtight tins. Imported seeds must be bought yearly and used the same season. The contents of a packet should not be sown all at once, but gradually in fortnightly sowings over a space of 6 to 8 weeks, so that a succession of vegetables is available. Keep the balance of the packet in a well-closed tin during this sowing period.

In places where temperatures are comparatively equable throughout the spring until the summer rise, it is easy to keep up a succession of cool season vegetables. Where there is a marked jump in temperature in the spring the later sowings catch up the early ones and run to seed very shortly after them, so that there is not always the advantage gained in successive sowings that one might imagine. Still, a steady supply of vegetables is often available if the first sowings are put down in good time.

The seeds of root vegetables are broadcast direct in the garden beds and the seedlings thinned out to allow room for the plants to develop. Peas and beans are usually dropped singly into shallow drills. Smaller seeds, like cabbage, cauliflower and lettuce, are sown in seed boxes or protected seed beds, and the seedlings transplanted later to the open ground.

Details regarding the preparation of seed boxes and seed beds, germination, sowing the seed and transplanting seedlings, will be found under the

## VEGETABLES

various headings in the section 'Propagation by seed' in the chapter on 'Plant Propagation'.

### Planting

To simplify the rotation of crops it is best to grow several kinds of similar vegetables in one bed. For instance, leaf vegetables like cabbage, lettuce or spinach, can be planted together with two wide-apart rows of cabbage and a row of lettuce or spinach between them. Quick-growing radishes may be put between rows of slower beetroots, whilst dwarf beans, that like shade, can grow between rows of peas, and so on.

The term 'to plant triangular fashion' means that the plants in successive rows are not opposite each other, the plants of the second row being midway in position between those of the first. This method of planting economizes space without restricting the plants. The tendency of the average *mali* is to plant too closely in his efforts to avoid wasting seedlings. Cramped surroundings produce poor vegetables and it is necessary to give enough room to each plant according to its needs.

Root vegetables should be allowed to develop somewhat before thinning, as when young they are very sweet and delicious. If the thinnings are pulled early, however, they should not be thrown away but planted elsewhere. The vegetables produced from the transplanted seedlings may not be of such good shape as those left to grow where they have been sown, but they do quite well for soups or *purées*.

Always keep the earth of the vegetable beds well forked and friable.

### Staking tall or climbing plants

The stakes for peas are sometimes made of long pieces of split bamboo, arranged criss-cross, or else

## THE GARDEN IN THE PLAINS

twiggy branches in a straight row. Sturdy single stakes are generally used for climbing beans of all sorts.

Trailing pumpkins or marrows can be grown on raised beds and allowed to ramble over the ground provided the seed is sown early enough for them to fruit in dry weather. Plants from later sowings, that will bear in the rains, should be supported off the ground to keep the fruit from rotting. Branches and brushwood spread on the ground round the plants will serve this purpose. Often gourds are grown over the thatch roof of a hut.

Tomatoes grown on a single stem should be supported by stakes, about  $4\frac{1}{2}$  feet high from ground level, from the time they are 8 or 9 inches high. Use raffia for binding, and tie it loosely to allow for the expanding stem. If the bushes have been raised so that the top growth develops umbrella-wise, it is necessary to give the rather top-heavy full-grown plants some sort of interlacing support as well. This can be done by placing a double row of stakes 2 or 3 feet high along the sides of the bed, with pieces of bamboo attached to them, lengthwise and across, between the bushes, and close enough to support the side branches.

### Blanching

To make some vegetables tender enough to eat it is necessary to blanch or turn them white by shutting out sunlight. With blanching, certain changes take place in the plant's make-up, and the vegetable becomes tender, instead of being hard and woody. If celery, for instance, is earthed up with soil to cover the stems, it will eventually become crisp and tender for the table.

## COOL SEASON VEGETABLES

In the following paragraphs the common name is

[ 358 ]

## VEGETABLES

put first, then the Latin name in brackets, and lastly the Hindustani.

Artichoke, Globe (*Cynara scolymus*), *Hatichuk*

Sow from August to the end of October. Although this is a perennial in the hills, it is usually grown as an annual in the plains. Seed should be sown in well-drained seed beds in light but rich soil. Germination is often slow. When four leaves have appeared transplant the seedlings to the open beds, each plant about 3 feet from its neighbour. Seedlings or offsets obtained from the hills will come into bearing much quicker than those grown from seed in the plains. Ready in about 6 months.

Artichoke, Jerusalem (*Helianthus tuberosus*), *Hatichuk*

Plant the tubers, either whole or cut into lengthwise sections, from February to the beginning of April, in rows  $2\frac{1}{2}$  feet apart. Each tuber should be about 3 inches deep in the ground and 2 feet from its neighbour. When the plants are about a foot high, earth up the stems at the base and support each plant with a small stake. Beds must be well trained. The crop will be ready to dig up in about 10 months.

Asparagus (*Asparagus officinalis*), *Paragus*

A perennial to be sown from September to November. Sow the seeds in beds of light but rich soil. When the seedlings are from 9 to 12 months old transplant them to well-drained beds which have been thoroughly trenched and manured. The plants should be 12 to 15 inches apart, and deeply set into the ground. A solution of salt and water applied occasionally is of great benefit to the plants. Every year fork a 6-inch layer of compost over the bed. After the third or fourth year the plants will be ready to cut.

Bean, Broad (*Vicia faba*), *Bakla sem*

These are not always satisfactory on the plains as the beans are rather flavourless, and often the fruit fails to set. On occasion the flowers have to be pollinated artificially with a feather. Sow seed in late October in well-trenched beds, each seed 15 inches from the next. As the plants grow the stems will need earthing up at the bottom. Do not let too many shoots spring from the base. When the

[ 359 ]

## THE GARDEN IN THE PLAINS

plants are well developed the growing points should be pinched off. Longpod type recommended.

Bean, French or Kidney (*Phaseolus vulgaris*), *Sem*

Sow seeds from August to October. The dwarf varieties are usually more satisfactory in the plains than the climbing types. Plant seeds 12 inches apart in rows, triangular fashion. The plants benefit from light shade. Water regularly.

Climbing French beans or Scarlet Runners succeed better in the hills than on the plains, although climbing beans do well sometimes. Light shade and protection from wind essential. Sow the seeds 3 inches apart, and stake the plants. Pinch off the tops when flowering begins. Water well.

Recommended varieties of dwarf beans are Canadian Wonder and Bountiful. Earliest of All is a climbing bean which usually succeeds in the plains. Ready in 10 or 14 weeks.

Beet (*Beta vulgaris*), *Chakunder*

Soil should be light and sandy. Sow seed from August to October. Broadcast in beds and thin out the seedlings to 6 inches apart. Do not let the roots become old and coarse before pulling, a good-sized globe being between  $2\frac{1}{2}$  and 3 inches in diameter. The Globe varieties recommended. Ready in 8 to 10 weeks.

Brussels Sprouts (*Brassica oleracea* var. *gemmifera*), *Chota kabi*

Sow from August to end of October in protected seed beds. When two true leaves appear transplant to open beds of rich soil in rows, triangular fashion, plants 2 feet apart. As the plants grow, earth up the stems firmly to just below the lowest sprout bud. Pinch back the head if the sprouts are shy of forming. Fillbasket and Exhibition varieties recommended. Ready in about 14 to 18 weeks.

Cabbage (*Brassica oleracea* var. *capitata*), *Kobi*

Sow from August to end of October. Sow seeds in boxes or broadcast them in protected seed beds, and transplant to the open when two true leaves have formed. The plants should be from 15 to 18 inches apart, or 20 inches for Drumhead or Pride of India varieties. Start earthing up the base of the stems when the plants are about 8 inches

## VEGETABLES

high. A rich soil and plenty of water are necessary. When the heads are forming, give fortnightly doses of liquid manure to which a level teaspoon of salt has been added per can. If the heads are cut at the neck leaving a few leaves, clusters of small heads will form. The red cabbage is only used for pickling as a rule. Sutton's Earliest, Maincrop, Eclipse Drumhead, and Pride of India can be recommended. Ready in 12 to 14 weeks.

Capsicum (*Capsicum longum* var. *grossum*), *Mirich*

These are the large, sweet and mild peppers that give such a subtle flavour to salads and stews. Sow in protected seed beds in August or September, and transplant to open beds. Soil light and rich. Ready in about 14 weeks.

Carrot (*Daucus carota*), *Gajar*

Sow from October to the end of November. Soil light, sandy and fairly rich. Broadcast seed direct in the open beds and thin out seedlings to 4 inches apart. There are two main types, those with long roots and tapering ends, and those with short, blunt roots, the latter succeeding the better of the two in many districts. James Intermediate, Sutton's Favourite and Chantenay are good medium varieties, and Champion Scarlet Horn and Early Gem are popular short types. Ready in about 16 weeks.

Cauliflower (*Brassica oleracea* var. *botrytis cauliflora*), *Phut kabi*

Sow acclimatized seed in July and early August and imported seeds in September and October. Sow in seed boxes, and when two true leaves have appeared transplant the seedlings to a seed bed, and when four leaves have appeared, to another seed bed, finally transplanting the seedlings to their beds in the open when six to eight leaves appear. This transplanting shocks the plant into producing good flower heads early. The seedlings are more delicate than those of cabbage or brussels sprouts, and need careful handling. The plants should be 15 to 18 inches apart, spaced triangular fashion. When the flower heads appear water with liquid manure. Tie a leaf over the flower to keep it white. The Snowball type is recommended, and the Patna strain is good among the acclimatized cauliflowers. Ready in about 14 to 16 weeks.

[ 361 ]

## THE GARDEN IN THE PLAINS

### Celery (*Apium graveolens*), Shaleri, Kurass

The seed is slow to germinate, and should be sown in early August to September. Sow in seed boxes, and when a few inches high transplant to protected seed beds. When the seedlings are 5 inches high transplant again to trenches outside. Trenches should be 18 inches wide. Dig the soil 12 inches deep and manure heavily. Remove the top 12 inches of soil, and plant the seedlings down the centre of the trench 9 inches apart. When the plants are a foot high start earthing them up by replacing the removed soil a little at a time every week, so blanching the stems. Tie the stems and leaves together while blanching is in progress. Some growers raise the plants in level beds and blanch the stems by wrapping brown paper round them. Solid White recommended. Ready in 4 to 6 months.

### Cress, Curled or Garden (*Lepidium sativum*), Halim

Seeds can be sown broadcast in beds or seed boxes in light soil with plenty of leaf mould. Fortnightly or weekly sowings throughout the cold weather will provide a steady supply for salads. Water well. For a hot weather supply grow the cress in boxes on the veranda. Ready a few days after sowing.

### Cress, Water (*Nasturtium officinale*)

A small perennial herb grown either from seed or offsets. It thrives best in shallow water courses where there is clear running water, in a gravelly soil. The source of the stream must be taken into consideration and every care taken to protect it from contamination.

### Endive (*Cichorium endivia*), Vilaiti kasni

Cultivated as a salad plant. Sow seed from October to November. Broadcast the seed in protected seed beds, and when the seedlings are a few inches high plant them out in the open beds 12 inches apart. Soil rich. When the plants are almost full-size the heads must be blanched. This is done by tying the leaves together after having made sure that they are quite dry, and covering the heads with caps of loosely woven dried grass. An alternative to this is an inverted flower pot. Blanching takes about a fortnight.

## VEGETABLES

### Kohl-rabi or Knol-Khol (*Brassica oleracea* var. *caulorapa*), Gant gobi

Sow from August to October. A plant of the cabbage family with the stem swollen to form a globe just above the ground. Broadcast seeds in open beds and thin out to 9 inches apart. When old the stems get woody and unfit to eat. Earliest White recommended. Ready in 10 to 12 weeks.

### Leek (*Allium porrum*), Vilaiti piyaj

Sow the seeds in September or October in seed beds and later transplant the seedlings to shallow trenches. Prepare the trenches by digging the ground a foot deep, then remove 6 inches of the soil. Plant the seedlings 6 inches apart down the centre of the trench. After the plants have been in the ground about 6 weeks, start earthing them up by replacing the removed soil. Trenches should only be 6 inches wide in rows 9 to 12 inches apart. Musselburgh or London Flag recommended. Ready in 3 to 5 months.

### Lettuce (*Lactuca sativa*), Salad

Sow seed in September to the end of November in boxes or protected seed beds, and when a few inches high transplant the seedlings to outside beds. Soil light and rich. Each plant should be from 12 to 15 inches from its neighbour. There are two main classes of lettuce, the *cabbage* which is thick and compact with broad, rounded leaves, and the *cos* which is more slender and has narrower, rather more pointed, leaves. The latter benefits by having the leaves tied to help the formation of hearts. The loose-leaved lettuce resembles the cabbage type. A.I and Supreme are fine cabbage lettuces, while Little Gem and Mammoth White are recommended of the cos type. Ready in 8 to 10 weeks.

### Mustard, Garden (*Sinapis alba*), Rai

Treat the same as Curled or Garden Cress. Can be grown in beds outdoors in the cold weather, and in boxes on the veranda in the hot months.

### Onion (*Allium cepa*), Piyaj

Sow from October to November. Broadcast the seed in open beds and thin the seedlings out to 8 or 9 inches apart. Good acclimatized seed can be used, the Patna strain, both

## THE GARDEN IN THE PLAINS

red or white, being well known and recommended. Ready in about 14 weeks.

**Parsley** (*Petroselinum sativum*), *Ajmud*

Sow from September to November in rich soil. Broadcast the seed in open beds and thin out. Partial shade is good. Imperial Curled is popular.

**Parsnip** (*Pastinaca sativa*), *Istufin*, *Jazur*

Sow from October to November. Broadcast the seed in open beds and thin out to 9 inches apart. Soil and treatment similar to carrots. Tender and True variety recommended.

**Peas** (*Pisum sativum*), *Matar*

The beds for peas should have been deeply trenched and well manured several months before the growing season. Sow from October to early December. Drop the seeds 4 or 5 inches apart in drills, and cover them with 1 inch of soil. There should be two drills to every bed, with space between them for a line of stakes. Put some small pieces of brush-wood at the foot of the stakes for the tendrils of the little plants to cling to. Water regularly. When the plants start to flower apply liquid manure at weekly intervals (see 'Liquid manure' in the chapter on 'Soil and Manuring'). In some districts the dwarf and medium peas succeed better than the tall-growing varieties. Early and Maincrop types are usually more satisfactory than the late bearing varieties. Sutton's Pioneer (earliest, 2 feet high), Duke of Albany (second early, 4 or 5 feet), and Sutton's Best of All (maincrop, 3 to 4 feet), can be recommended. Ready in 8 to 12 weeks.

The French Sugar Pea (Mangetout) grows 4 or 5 feet high, and is useful as the pods are cooked with the peas inside them and the whole eaten.

**Potatoes** (*Solanum tuberosum*), *Alu*

Plant local tubers in September or October, and those brought down from the hills in November. The soil should have been well manured with cow manure and wood ashes some months previously and deeply cultivated. Seed potatoes or tubers have been stored specially, and are not suitable for eating. They are either selected the size of an egg and planted whole, or somewhat larger tubers are taken and cut

## VEGETABLES

into several sections lengthwise through the crown, each section with two 'eyes' or buds. The whole tubers or the sections are then planted 3 or 4 inches below the soil and 15 inches apart, in rows 24 inches apart. Water should be given at regular intervals but sparingly from when the shoots appear, until the leaves begin to turn colour and wither, when it must be withdrawn altogether. When the plants are 8 inches high start to earth up gradually as they grow, until the ridges are about 10 inches high. The crop will be found to be mature when the leaves and stems have died down completely. Ready in 4 or 5 months as a rule.

**Radish** (*Raphanus sativus*), *Muli*

Sow from August to January at weekly intervals in shallow drills, or broadcast. Thin out to 4 inches. There are turnip-shaped, oval or long-rooted types. Red White-tipped, and Red Turnip-shaped are attractive looking varieties. Ready in 4 or 5 weeks.

**Spinach** (*Spinacea oleracea*), *Palak sag*, *Isfanaj*

Sow from October to the middle of November. Broadcast in open beds and thin out to 12 inches apart. A slightly shaded situation is preferable to full sunshine. Long-standing Round and Victoria are well known and liked. Ready in 10 to 12 weeks.

**Spinach, New Zealand** (*Tetragonia expansa*)

A hardy annual plant the leaves of which are used the same way as ordinary spinach, but it is rather coarse in flavour compared with the true spinach.

**Tomato** (*Lycopersicum esculentum*), *Vilaiti baigan*

Soil light and rich. Manure the ground some weeks before the sowing season with well-rotted cowdung, and add a sprinkling of wood ashes. Sow from the end of July to the end of October in seed boxes, and when the seedlings are a few inches high transplant them to a slightly raised bed. Again when two more leaves have appeared, transplant to the final beds in the garden. Each plant should be 24 inches from its neighbour. Stake as recommended earlier in this chapter.

There are several ways of conserving energy for the fruit.

- (1) Nip off surplus leaf shoots at the axils of the leaves

## THE GARDEN IN THE PLAINS

to reduce branching, and grow the plant as a single stem. Pinch the top of the stem when it has reached a height of  $3\frac{1}{2}$  to  $4\frac{1}{2}$  feet.

(2) Remove a few of the lower branches so that the top growth develops umbrella-wise over bamboo supports, and then thin out bud clusters.

Water the plants with liquid manure once a week while the buds are forming. (See 'Liquid manure' in the chapter on 'Soil and Manuring'.) Chemical manures may be used once or twice, a well-balanced mixture being as follows.

### Fertilizer for tomatoes

- 1 part sulphate of ammonia
- 3 parts superphosphate
- 1 part sulphate of potash

Use  $1\frac{1}{2}$  oz. mixture dissolved in one gallon of water. Damp the soil round the plants before watering with the fertilizer.

Ponderosa and Sutton's Best of All are good red-fruited types, and Golden Queen is a popular yellow-fruited variety. Ready in about 12 weeks.

### Turnip (*Brassica rapa*), Shalgam

Broadcast seed from September to early December in open beds, and thin out to 8 or 9 inches apart. Soil light and rich. If the leaves are eaten by small, black caterpillars, syringe them with a naphthalene emulsion. (See 'Biting insects that eat leaves' in the chapter on 'Pests and Diseases'.) When young the leaves can be used for the table if they are steamed and then mashed with a little butter. Early Snowball, White Gem and White Milan recommended. Ready in 8 to 12 weeks.

### Vegetable Marrow, Squash (*Cucurbita pepo*), Vilaiti kaddu, Kumra

In places with a mild winter this marrow can be grown as a cool-season vegetable, but in districts where the cold is severe it is better raised in the early hot weather, or in the rains if the climate is very dry. Fruits produced in cool weather usually have more flavour.

Soil must be very rich. Sow the seeds 12 to 15 inches apart where the plants are to remain, from early September until December for fruiting in the cool season, or from

[ 366 ]

## VEGETABLES

February to April for hot weather use. Marrows are trailing plants that can be grown on raised beds and allowed to ramble on the ground in dry weather, but in the wet season the branches should be lifted off the ground on low supports formed by heaps of brushwood. Dust the leaves with ashes as a precaution against small beetles, and with flowers of sulphur if mildew appears. If beetles succeed in doing much damage to the leaves, syringe them with a naphthalene emulsion, as described in the section 'Biting insects that eat leaves' in the chapter on 'Pests and Diseases'. Long White and Table Dainty are recommended. Ready in about 12 weeks.

### Herbs

It is usual to buy packets of mixed herb seeds, but they can, of course, be bought separately. The seeds of most herbs are sown from September to the beginning of November. Broadcast the seed and thin out to 12 inches. Those to be grown in pots must be carefully transplanted or the seeds sown direct in the pots. Soil light and sandy with plenty of old manure.

### Basil (*Ocimum basilicum*), Gulal tulsi

Usually grown in pots as it is liable to succumb to the monsoon if planted outside.

### Coriander (*Coriandrum sativum*), Kathamira (plant) Dhanya (seed)

Ready in 12 to 16 weeks.

### Dill (*Peucedanum graveolens*), Sowa

Ready in 12 to 16 weeks.

### Fennel (*Foeniculum vulgare*), Saunf

Ready in 4 or 5 weeks.

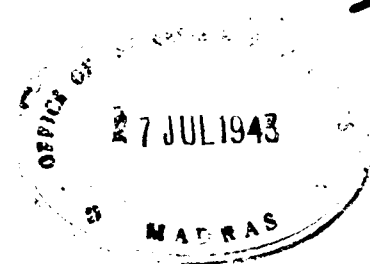
### Mint (*Mentha viridis*), Pudeena

Raised easily by division or from cuttings put down in July in sandy soil. Good drainage is essential.

### Sweet Marjoram (*Origanum vulgare*), Bantulsi

A perennial plant. Thin to 8 or 9 inches apart. Ready in 12 to 16 weeks.

[ 367 ]



Thyme (*Thymus vulgaris*)

In the plains this plant is delicate and difficult to rear, and is best grown in a pot.

Sage (*Salvia officinalis*), *Seesti*

Best kept in a pot.

### Mushrooms

Mushrooms are difficult to grow in some parts of India on account of the wide range of temperature and other factors. If their cultivation is to be attempted the grower must have a cool dark outhouse, with stone walls for preference, in which to raise the mushrooms. There must also be a good supply of horse manure available, which must be picked clean of all bits of straw and other foreign matter.

The manure is placed in a heap with a sprinkling of earth and left for a few days, then it is opened up and re-stacked. This process is repeated several times until the temperature in the heap cools to about 80 degrees Fahrenheit. The manure is then arranged in heaped beds 3 feet deep in the centre, ready for the spawn.

The spawn is procured in 'bricks' or cakes which are broken up into pieces of about 1½ inches square, and pressed on to the manure. The pieces are left for a few days, and then covered with a 1-inch layer of dry earth. Spray the walls and ceiling of the outhouse with water to keep the atmosphere moist, but only water the heap of manure directly if the weather is very dry. Mushrooms should be ready for picking in about two months from spawning. Spawn is best put down first in the early monsoon, in monthly sowings until January.

The above notes give a rough idea of the process, but more precise details should be obtained from the suppliers of mushroom spawn bricks.

[ 368 ]

### COUNTRY VEGETABLES

Asparagus or Cuba Bean (*Vigna catiang* var. *lobia*), *Lobia*

An annual with a climbing habit. Sow from April to July and train up supports. The fruit is a long pod often served like a French bean. Ready in about 9 weeks.

Chilli (*Capsicum frutescens*), *Mirich*, *Lal mirich*

Sow seed from the beginning of April to the end of June in a seed bed and transplant to outside beds, each plant 12 inches from its neighbour. This is the common hot, red chilli. Ready in 10 weeks.

Country Bean (*Dolichos lablab*), *Sem*

Sow the seed from early May to the end of June in beds in rows, each seed 6 to 9 inches from the next. Stake well as the bean is a climber. The pods are used while young and resemble French beans. Ready in 4 or 5 months.

Cucumber (*Cucumis sativus*), *Kheera sukasa*

Sow the seeds from the beginning of March to early July, in well-manured beds in groups, and thin out to 3 or 4 feet apart. The plant is a climber and requires staking. Dust the leaves with wood ashes if beetles are a nuisance, or spray with a naphthalene solution, as described in the section 'Biting insects that eat leaves' in the chapter on 'Pests and Diseases'. This cucumber is rather difficult to rear in many plains districts. Ready in about 14 weeks.

Cucumber, Indian (*Cucumis melo* var. *utilissimus*), *Kakri*

Sow the seed from early February to April, in groups and thin out to 3 to 4 feet. The fruits much resemble the ordinary cucumber while they are young, and can be used raw in salads.

Egg Plant, Aubergine (*Solanum melongena*), *Brinjal*

Sow in October for a spring crop, and in March for an autumn crop. Sow in seed beds, transplanting twice to other beds and finally out to the ground. Plants should be 18 inches apart and the soil rich. A small shrub bearing purplish or white fruits, their shapes and sizes differing according to the variety. One of the best country vegetables. Ready in about 5 months.

[ 369 ]

## THE GARDEN IN THE PLAINS

### Gourd, Bottle (*Lagenaria vulgaris*), *Lauki*, *Alkadoo*

Sow seeds from February to the end of March in a rich soil, in groups 5 feet apart, retaining the strongest seedling in each group. An annual creeper with a long pale green fruit used as a vegetable when young. Grow it over a low support or on a thatched roof. Ready in 12 weeks.

### Gourd, Club or Sponge (*Luffa acutangula*), *Jhinga*

Sow from early March to July. A creeping annual with green fruits, sharply ribbed. Sow in groups or rows and thin out to 3 or 4 feet. In dry weather it can be left to ramble on the ground but it should be supported off the earth in wet weather.

### Gourd, Cylindrical Sponge (*Luffa aegyptiaca*), *Dhandoll*, *Ghiya taroi*

Sow from early March to July. Very much resembles the Club gourd and needs the same treatment.

### Gourd, Snake (*Trichosanthes anguina*), *Chichinga*

Sow from early April to June, in rows and thin out to 4 feet. This is a climbing annual that needs support. The fruits are long and slender streaked light and dark green. Ready 12 to 14 weeks.

### Gourd, White (*Benincasa cerifera*), *Panee kumra*

Sow seed from April to July. Sow the seed in groups, 5 feet apart, and retain the strongest seedling of each group. Soil rich. A climbing annual usually grown over the roof of a thatched hut. The fruit is a large, oblong gourd with a greyish-white waxy bloom over it. Ready in 5 or 6 months.

### Indian Corn or Maize (*Zea Mays*), *Bhutta*, *Makai*

Sow early April to end of June. Sow outside in rich soil, seeds 12 inches apart. Water regularly. When the plants are about a foot high earth up the stems for about 4 inches and another 6 inches when the plants are 2 feet high. American or good acclimatized seed does best. Ready in about 14 weeks.

### Karela (*Mormordica charantia*)

Sow seed early March to July, in groups 3 feet apart and retain the strongest seedling in each group. A trailing

## VEGETABLES

annual with small dark green warty fruits that turn to orange as they ripen. They can be allowed to ramble on the ground. There is another type of Karela which fruits in the rains, and this should be supported a few feet off the ground.

### Okra, Gumbo, Ladies Fingers (*Hibiscus esculentus*), *Bhindi*

Sow seed from March to early July, in seed beds and when the seedlings are 4 inches high transplant them to beds in the open, each plant 2 feet from its neighbour. The plants grow 4 feet high and produce pods that are eaten as a vegetable. They are rather an acquired taste owing to their sliminess. Pinch back the leader to induce fruiting. Ready in 14 to 16 weeks.

### Palwal (*Trichosanthes dioica*), *Palwal*

Sow from May to June, or plant roots in July and August. A perennial plant with annual stems and pale green fruits which turn to orange when ripe. Sow in groups or rows and thin out to 3 feet, in raised beds so that the plant can ramble on the ground. Ready in about 12 weeks.

### Pumpkin, Red (*Cucurbita moschata*), *Lal kumra*

Sow from early March to the end of June. Sow in groups 4 feet apart and retain the strongest seedling in each group. A trailing plant with pale green or brownish-red fruits with orange-red flesh. Like other pumpkins it can ramble on the ground or over a low support.

### Spinach, *Sag*

Sow spinach from April to July. Broadcast the seed and thin out to 12 inches.

(In the following list of spinaches the Hindustani name is put first.)

### *Kuffa sag*, Purslane (*Portulaca oleracea*)

A dwarf annual herb of creeping habit. Ready in 8 or 9 weeks.

### *Lal sag* (*Amarantus*)

A soft-wooded annual plant. Thin out to 18 inches. Ready in about 6 weeks.

## THE GARDEN IN THE PLAINS

*Palang sag*, Indian Spinach Beet (*Beta maritima*)

Sow in October. Ready in about a month.

*Poi sag*, Malabar Nightshade (*Basella rubra*)

A perennial climber the leaves of which are used as spinach. Support the plants. Ready in 12 or 13 weeks.

Sword Bean (*Canavalia ensiformis*), *Bara sem*

Sow April-June. Plant the seeds about 3 inches deep in rows 15 inches apart. A climbing perennial plant that needs staking. Pods 10 to 12 inches long that are eaten while young. Ready in about 6 months.

Sweet Potato (*Ipomoea batatas*), *Mitha alu*, *Sakurkund*

Plant cuttings from April to June, 18 inches apart. A climbing plant with a swollen, tuberous root. By the early cold weather the roots will be ready to use.

Yam (*Dioscorea sativa*), *Ratalu*

Plant roots from March to May. A climber with annual stems and perennial roots which resemble an inferior potato when cooked. Ready in about 10 months.

### Condiments

Garlic (*Allium sativum*), *Iason*

Plant in October or November, the cloves 8 inches apart. Ready in February or March.

Ginger (*Zingiber officinale*), *Adrakh*

Plant the fleshy rhizomes in May, 15 inches apart in raised beds. Start earthing up the plants when they are a foot high.

Turmeric (*Curcuma domestica*), *Huldi*

Perennial plants with ginger-like roots which are dried and ground to a powder. Cultivated in the same way as ginger.

## Chapter xxiii

### FRUITS

'The nectarine, and curious peach,  
Into my hands themselves do reach.'

—Andrew Marvell

Site and soil—Pruning—Manuring—Fruit failing to set—Pests and diseases—A SELECTION OF FRUITS—Low-growing fruits—Small trees and climbers—Medium to large trees

THERE is something particularly satisfying about collecting and preserving fruits raised in one's own compound. Town gardens seldom have space for fruit trees, however, although most of them have odd corners that could be filled profitably with papayas, which take up very little room, or a lime tree. In country places the compounds are nearly always big enough to allow of a small plot for fruit. For medium-sized gardens it is advisable to select a few of the small-growing fruit trees, for only in very big compounds is it possible to grow a representative selection of both large and small types. Give each tree sufficient space for its size when full grown, as an overcrowded orchard never thrives.

In the following lists of trees only those which will thrive in the plains have been mentioned. Fruits such as the apricot, plum, apple and imported varieties of peach do well in some hill stations, but are not suited to low elevations. However, some varieties of peach may succeed in certain plains districts, if acclimatized early-fruited varieties are grown. Stone fruits usually thrive best in rather dry districts, lush fruits like the papaya prefer a moist climate.

[ 373 ]

**Site and soil**

A well-drained piece of ground is essential for an orchard, for water-logged soil is disastrous for fruit. The protection of a wind break on the windy side of the plot is an advantage, but the fruit trees should have full sun.

The soil must be deep and well cultivated. If the trees are to be grown in an orchard the ground can be prepared a year before planting by growing a green crop over the plot. (See the section 'Green manure for the vegetable garden' in the chapter on 'Soil and Manuring'.)

*Preparing pits and planting*

Pits should be dug and manured at least six months prior to planting as fresh manure should not come in contact with the roots of the young trees. Each pit must be dug 4 feet in diameter and 4 feet deep, or even 5 feet by 5 feet if the soil is very poor. Before replacing the dug soil add to it five or six basketsful of cow manure or compost, one of wood ashes and some old bones crushed to small pieces. The surface of the pit should be slightly raised above ground to allow for subsequent sinking of the earth.

*The actual planting*

The best time to plant fruit trees is the early rains; but if grafts are imported these may have to be planted in the cold weather when they arrive, and should be watered and shaded until the plants are established.

Before planting the trees, dig the soil in the pit again and water it lightly before inserting the plant.

When fruits are grafted low, the point of union should be buried just below the soil. If, however, the plants have been grafted several inches up the stem of the stock, this cannot be done, of course.

Do not remove the ball of earth round the roots, but see that the tap-root is straight in the hole and that the side-roots are not crushed. Press the earth firmly round the neck of the tree and give shade if the weather is dry.

Shrub fruits can be 10 to 14 feet apart, small fruit trees need 15 to 18 feet between each tree, and medium to large trees 20 to 25 feet, or even 30 feet for a tree such as the mango.

*After-care*

In dry and hot weather the young trees will need an occasional thorough watering. Do not water right against the stem of the plant, however. Give protection from wind if necessary, and shade to recently planted trees.

Stake young trees to prevent them from being wind-wrung or developing a crooked trunk.

Cut off any suckers showing below the point of union on grafted plants.

Always keep the ground round the foot of a fruit tree weeded, clear of grass, and forked for a distance of at least three feet.

**Pruning**

Espalier work or the training of fruit trees flat onto wire fences or a trellis, and other complicated refinements of pruning and shaping, are not generally practised on the plains of India. The pruning of tropical fruit trees such as the mango, sapota or litchi, and most citrus fruits, is confined to shaping the tree while young, and keeping the frame clear by cutting out dead wood, blind shoots, and interlacing growth. Some trees form good frames naturally and unaided. At times, however, trees may grow up and up, and will need the main shoot cut or headed back to induce spread.

## THE GARDEN IN THE PLAINS

Peaches and grape vines need their growth cut back to conserve energy for the remaining buds. Information regarding the pruning of these will be found in the paragraphs about the trees in question. For general notes on pruning see the chapter on 'Pruning' in Part II.

### *Shaping citrus and mango trees*

With citrus fruit trees a certain amount of care in the shaping is necessary. The plant is allowed to grow about 3 feet high, and then it is cut straight across the top at 2 feet and left for the time being. This causes the plant to throw out side-shoots, and of these only 5 or 6 of the strongest should finally be left, the rest being removed. Do not retain any branches that are likely to be too near the ground, and those remaining should be well spaced. Mangoes are often shaped this way.

Subsequent pruning is usually confined to cutting out interlacing growth, blind shoots and dead wood. The plants should be watched for shoots coming from below the point of union on a grafted plant, and straight suckers from the frame can be cut away unless additional primary branches are needed.

### *Root pruning*

Root pruning is sometimes resorted to if a fruit tree is shy of blooming, because very free rooting makes for vegetative growth at the expense of flower and fruit. Sometimes a small tunnel is cut under the tree and the tap-root severed. The more usual method of root pruning is to cut a circular trench 3 feet deep and 18 inches wide, and from 4 to 9 or 10 feet from the trunk according to the size of the tree. The lateral roots exposed by the trench are severed cleanly and the loose pieces removed. After a week or two the excavated soil is mixed with some very old cow manure or compost and returned to the trench. This

[ 376 ]

## FRUITS

treatment is rather drastic and should only be resorted to if special manuring has failed to encourage fruit. Root pruning can be a great shock to a plant, and if the tree in question seems out of condition, it is wiser to root-prune by halves in alternate years.

### *When to prune*

Speaking generally, fruit trees are best pruned or 'cleaned' towards the end of their dormant period. The end of December to early February is the right time in many cases.

### *Manuring*

If the pit has been well prepared and manured previous to planting, as described, the tree will have a good start. Subsequent bulk manuring will generally take place with the spring rains, or after pruning or wintering. A good general food is as follows.

### *General mixture for fruit trees*

- 1 heaped basket cow manure or compost
- ½ basket wood ashes (8 to 10 lb.)
- 1 lb. bonemeal

This should be forked in round each tree at the beginning of the rains, or after pruning or wintering.

Artificial fertilizers can also be applied at the beginning of the rains, or about 2 months before the tree is due to fruit.

### *General artificial fertilizer*

- 2 parts sulphate of ammonia
- 3 parts superphosphate
- 1 part sulphate of potash

Use ¼ lb. of this mixture for a shrub and up to 4 lb. for a big tree. Damp the ground before forking the fertilizer round the tree, and water afterwards.

Lime is also of benefit, and a mixture of 8 oz. crushed limestone and 1 lb. bonemeal may be forked

[ 377 ]

## THE GARDEN IN THE PLAINS

found each tree some years in place of the general fertilizer just described.

### Fruit failing to set

Before fruit can form, the flower must be fertilized by pollen either from the same flower or another similar flower. On occasions fruit may fail to set. This may be due to a variety of causes, e.g. lack of the right insects to carry pollen from one flower to another, the wrong weather conditions, or in some cases when there are separate male and female trees, absence of the male. The papaya is an example of a fruit tree where the sexes are on different plants.

Phosphatic manures are a good stimulant to fruiting if the plants are reluctant to bear (see the chapter on 'Soil and Manuring'); but if external conditions are not favourable for pollination no amount of manure will help to produce fruit.

### Pests and diseases

It is necessary to protect fruit from large pests such as fruit bats, squirrels, birds and monkeys. The most effective method is to net the trees, but the outlay is heavy if there are many to be protected. For dealing with insect pests like beetles and borers, see the section on 'Insect pests' in the chapter on 'Pests and Diseases'.

The trunk of a mature fruit tree and the larger branches are often affected by mosses and lichens which settle on the hide-bound bark. The bark may be softened and the epiphytes controlled by painting with lime-water, mentioned in the section 'Fungus sprays and washes' in the chapter on 'Pests and Diseases'.

Fruit trees occasionally suffer from fungus diseases. These can be combated indirectly by attending to the cultivation of the soil and ensuring thorough drainage. For direct attack on the fungus see the sections

## FRUITS

'Fungi, fungus diseases and other plant troubles' and 'Fungus sprays and washes', in the chapter on 'Pests and Diseases'. Citrus fruits, especially, should be treated with Bordeaux mixture once a year regularly. This is best applied in early June.

### A SELECTION OF FRUITS

In the following lists of fruits the common English name is put first, followed by the Latin in brackets and lastly the Hindustani.

#### Low-growing fruits

Cape Gooseberry (*Physalis peruviana*), *Tipparee*

The Cape Gooseberry is a dwarf shrub which bears small round yellow fruits hidden in dry, papery cases. The fruit makes an excellent jam and is nice stewed. Although the plant is a perennial it is usually grown annually. As the plant fruits in the cold weather it does not succeed in places which have severe early morning frosts.

Soil light. Sow from April to the end of June. Broadcast the seed in a nursery bed, and when the seedlings are a few inches high transplant them to beds in the open, plants 2 feet apart. The beds should be raised to ensure good drainage. Ready in about 6 months.

Melon (*Cucumis melo*), *Karbuza*

A creeping gourd, the fruit of which is used as a dessert. The shapes and sizes vary with the different varieties, but the skin is usually veined or netted. The plant likes a certain amount of moisture at the roots but prefers a dry climate.

Soil sandy but richly manured. Sow the seed in January or February in groups about 5 feet apart, and retain the strongest seedling in each group. Give plenty of water.

*Cucumis melo* var. *momordica* is a variety of melon, which is used in salads while young and green. The fruit bursts open and is of a pale yellow colour when ripe, and is then used as a dessert fruit.

Melon, Water (*Citrullus vulgaris*), *Tarbuz*

Sow in February and early March. Often grown in prepared holes on the dry beds of rivers. This plant likes

## THE GARDEN IN THE PLAINS

found each tree some years in place of the general fertilizer just described.

### Fruit failing to set

Before fruit can form, the flower must be fertilized by pollen either from the same flower or another similar flower. On occasions fruit may fail to set. This may be due to a variety of causes, e.g. lack of the right insects to carry pollen from one flower to another, the wrong weather conditions, or in some cases when there are separate male and female trees, absence of the male. The papaya is an example of a fruit tree where the sexes are on different plants.

Phosphatic manures are a good stimulant to fruiting if the plants are reluctant to bear (see the chapter on 'Soil and Manuring'); but if external conditions are not favourable for pollination no amount of manure will help to produce fruit.

### Pests and diseases

It is necessary to protect fruit from large pests such as fruit bats, squirrels, birds and monkeys. The most effective method is to net the trees, but the outlay is heavy if there are many to be protected. For dealing with insect pests like beetles and borers, see the section on 'Insect pests' in the chapter on 'Pests and Diseases'.

The trunk of a mature fruit tree and the larger branches are often affected by mosses and lichens which settle on the hide-bound bark. The bark may be softened and the epiphytes controlled by painting with lime-water, mentioned in the section 'Fungus sprays and washes' in the chapter on 'Pests and Diseases'.

Fruit trees occasionally suffer from fungus diseases. These can be combated indirectly by attending to the cultivation of the soil and ensuring thorough drainage. For direct attack on the fungus see the sections

## FRUITS

'Fungi, fungus diseases and other plant troubles' and 'Fungus sprays and washes', in the chapter on 'Pests and Diseases'. Citrus fruits, especially, should be treated with Bordeaux mixture once a year regularly. This is best applied in early June.

### A SELECTION OF FRUITS

In the following lists of fruits the common English name is put first, followed by the Latin in brackets and lastly the Hindustani.

#### Low-growing fruits

Cape Gooseberry (*Physalis peruviana*), *Tipparee*

The Cape Gooseberry is a dwarf shrub which bears small round yellow fruits hidden in dry, papery cases. The fruit makes an excellent jam and is nice stewed. Although the plant is a perennial it is usually grown annually. As the plant fruits in the cold weather it does not succeed in places which have severe early morning frosts.

Soil light. Sow from April to the end of June. Broadcast the seed in a nursery bed, and when the seedlings are a few inches high transplant them to beds in the open, plants 2 feet apart. The beds should be raised to ensure good drainage. Ready in about 6 months.

Melon (*Cucumis melo*), *Karbuza*

A creeping gourd, the fruit of which is used as a dessert. The shapes and sizes vary with the different varieties, but the skin is usually veined or netted. The plant likes a certain amount of moisture at the roots but prefers a dry climate.

Soil sandy but richly manured. Sow the seed in January or February in groups about 5 feet apart, and retain the strongest seedling in each group. Give plenty of water.

*Cucumis melo* var. *momordica* is a variety of melon, which is used in salads while young and green. The fruit bursts open and is of a pale yellow colour when ripe, and is then used as a dessert fruit.

Melon, Water (*Citrullus vulgaris*), *Tarbuz*

Sow in February and early March. Often grown in prepared holes on the dry beds of rivers. This plant likes

## THE GARDEN IN THE PLAINS

a sandy but richly manured soil, and although it appreciates a certain amount of moisture at the roots, like other melons it succeeds best in rather dry places which have a late monsoon. Give plenty of water.

**Pineapple** (*Ananas sativus*), *Ananas*

Pineapples succeed best in a fairly moist climate. Good drainage is essential and the plants are best grown in raised beds. The soil should be enriched with cow manure and wood ashes some months before planting. Potash manures can be applied if the fruit is poor. Damp the soil first, then sprinkle  $\frac{1}{4}$  oz. sulphate of potash round each plant and fork it in. Finally water the ground lightly.

Pineapples are propagated by suckers from the base of the plant or by crowns of the fruit. The former come into bearing in about  $1\frac{1}{2}$  years whereas the latter may take 2 or 3 years. Plant the suckers or crowns in rows 3 feet apart, and 2 feet between each plant. Give water regularly until the last stages of ripening, then water more sparingly in order to avoid insipid, pale fruits. Remove superfluous suckers as they form.

Imported varieties give excellent fruit. Ripley Queen, Mauritius, Red Spanish, Smooth Cayenne or Giant Kew are well-known types. Usually varieties with wide, smooth leaves give better fruits than those with narrow, spiny leaves.

**Rozelle, Red Sorrel** (*Hibiscus sabdariffa*), *Patwa*

This is a small annual shrub 4 to 7 feet high. The flower is pale yellow with a dark eye, and has fleshy sepals which remain after the flower has fallen and become large and succulent. These swollen sepals make an excellent preserve, resembling red current jelly, if picked while they are still soft and juicy.

Soil rich. Sow in April-May in a seed bed and transplant the seedlings later to open beds. The plants should be 4 to 6 feet apart. Ready in 5 or 6 months and will bear for 6 or 8 weeks.

**Strawberry** (*Fragaria vesca*)

The strawberry is not often satisfactorily grown on the plains for the fruit is usually small and flavourless. Occasionally good fruit is produced and the grower is justly proud. Choose an open situation and prepare raised beds. The soil must be light, well dug and richly manured. The

## FRUITS

runners should be planted from October to December, the plants 12 inches apart in rows, triangular fashion. Water regularly. The plants should be surrounded with fern fronds or straw to raise the berries off the ground. Fruit should appear from March to May, but in some places the plants go on producing leaves and refuse to fruit at all.

### Small trees and climbers

**Averrhoa**

*A. carambola* is a small tree suited to moist, tropical climates. It bears an oval, ridged fruit of amber yellow, about 4 inches long. Often used for jam; although the fruits are rather acid, they are very juicy and refreshing raw.

*A. bilimbi* resembles the above, except that the tree grows taller and the fruits are less sweet, looking like small green cucumbers. Too sour to be eaten raw, but commonly used for pickles and preserves. These trees are natives of the Moluccas.

**Custard Apple** (*Anona squamosa*), *Sareefa*, *Ata*

A small- to medium-sized tree bearing fruits from August to October. The fruits are the size of a large apple, with a lumpy rind which appears to be composed of small segments or scales. When ripe these break open and expose black seeds buried in a sweet white pulp which is like a rather granular custard. Choose a large-fruited variety which has plenty of pulp rather than many seeds. The tree thrives best in comparatively dry regions, but it will grow in moist climates if drainage is good. Seedlings bear fruit in 5 or 6 years. While in fruit, water frequently if the weather is dry, and net the tree as a protection against squirrels and the like. Mammoth variety recommended.

**Fig** (*Ficus carica*), *Unjeer*

A small deciduous tree with large leaves. It must be grown in a dry climate to get well-formed fruit with flavour. Soil porous but rich. Protection from strong winds essential. Allow 15 or 16 feet between trees. In the way of pruning, leaders should be pinched back, long scraggy growth tipped back systematically, and superfluous shoots cut out to leave well-spaced short-jointed growth. Best propagated by *gootee* grafts which bear in 2 or 3 years. Fruits in March-May.

## THE GARDEN IN THE FLAINS

Water well while bearing to prevent fruits falling. **Black Ischia, Green or Brown Turkey** recommended.

### *Flacourtia*

*F. cataphracta* is a small- to medium-sized tree with small leaves and many thorns. Bears round berries the size of big cherries of a dark purplish colour at the end of the rains. The fruit is too sour to eat raw but is nice stewed and makes a good jam.

*F. inermis*, the Lovi-lovi, has larger leaves than the above and no thorns. The fruit makes an excellent jelly.

### Grape fruit (*Citrus grandis* var. *decumana*)

This fruit, which resembles a small pomelo in appearance, is becoming increasingly popular on account of its clean, delicate flavour. The trees are not cultivated in India to any extent as yet, but there seems no reason why they should not thrive in the more temperate districts. The trees are usually grafted or budded and bear in 5 or 6 years, fruiting in the cool season. Shape while young as recommended in the paragraph on pruning, and spray with Bordeaux mixture yearly in June. Marsh's Seedless, McCarthy and Triumph recommended.

### Grape Vine (*Vitis vinifera*), *Angoor*

Although the vine may grow well in some places, in others the grapes are frequently disappointing, being small, rather tasteless and often acid. Their culture should only be attempted in rather dry districts with a late monsoon. Soil should be light, well drained and deeply cultivated. A heavy clay is not suitable.

The vine can be propagated by cuttings. Grapes appear at different times of the year according to climatic conditions. For instance, in Central India the plant fruits in the early spring, and in Quetta in the early autumn.

The plant needs frequent manuring, both with a bulk manure after pruning, and with an artificial fertilizer at the beginning of the rainy season when growth becomes active. A good chemical mixture consists of 1 lb. bonemeal,  $\frac{1}{2}$  lb. sulphate of ammonia,  $\frac{1}{4}$  lb. sulphate of potash forked round each plant.

The vines are usually grown over a trellis, but they are sometimes trained to grow up a small tree or a single stake, and are then headed back at 5 feet or so to allow pendant

## FRUITS

branches to form. The plants should be trained from the start according to the shape they are to take.

In a garden the most practical method is to support the vines on a pergola with trellised sides. The vines are planted 7 or 8 feet apart, and each plant allowed to branch into three main arms at a height of  $2\frac{1}{2}$  to 3 feet. These branches are spread out and fastened to the trellised sides of the pergola. The vines will grow and spread over the roof of this support, and as they develop, side branches will appear. The trunk of the vine should be kept clear of all growth below the forking of the main arms.

Pruning takes place when the crop has finished. At the first pruning, the side branches all along the three main arms should be thinned out until they are well spaced at 12-18 inches, the weaker branches being removed. Those remaining will then be cut back to two or three buds, to form short spur-heads. During the ensuing growing season fruit-bearing shoots will spring from these spur-heads. Annually at pruning time the shoots that have borne fruit are cut back and shortened, again to two or three buds, to form new spur-heads which will bear the fruit-producing shoots that year. This means that the wood which bears the fruit is pushed forward every year. After a few years the vigour of the wood may decline somewhat. In that case the whole side branch should be cut back close to the main arm from which it springs, and a new branch allowed to develop from another bud. Each year superfluous side branches which appear should be removed in order to keep the frame clear.

Each fruit-bearing shoot should only be allowed to carry a limited number of clusters, and each cluster should have the grapes thinned out carefully with a pair of scissors so as to improve the size and quality of those that remain.

Grape vines are occasionally attacked by fungus diseases, and when this occurs, spray with Bordeaux mixture.

### Guava (*Psidium guyava*), *Amrood*, *Pyara*

A large shrub or small tree which bears fruit in the rains and occasionally in the cool season. The fruits are round or pear-shaped, and are either of a pale yellow colour with white flesh, or greenish yellow with pink flesh. Grafted trees will bear fruits with fewer seeds and will crop in 3 or 4 years. The fruits are used for guava jelly, guava cheese, and for stewing.

The Strawberry Guava (*Psidium cattleianum*) is a small

## THE GARDEN IN THE PLAINS

shrubby tree with round, reddish-purple fruits suitable for tarts or stews. This guava is often seen at the lower hill stations, and is suited to the cooler plains districts.

### Indian Plum (*Zizyphus jujuba*)

A small, thorny tree suited to rather arid districts, bearing small yellow fruits in December-January. The pulp is nice stewed. Choose a thick-fleshed variety. Usually raised from seedlings.

### Kumquat (*Citrus japonica*)

A small tree bearing fruits which resemble miniature oranges. The tree is very ornamental in the cold weather when it is covered with the tiny orange fruits, which make an excellent preserve. Best propagated by grafts.

### Lemon (*Citrus limonum*), Gorah nimbu

Layers or grafted plants can be obtained from most Government gardens. The fruit produced in India usually has a very coarse, thick skin, so try to procure a thin skinned type if possible. Shape the young tree as recommended in the section on pruning in this chapter. Spray with Bordeaux mixture yearly in June.

### Lime (*Citrus acida*), Nimbu

The fruits are small and either round or oval. Buy grafts of thin-skinned types. Plant 12 to 15 feet apart. After the initial shaping of the bush to get a good frame, pruning is usually confined to the cutting out of poor, non-productive wood and to keeping the frame clear of interlacing growth. Spray with Bordeaux mixture yearly in June. These limes make good lemonade.

### Lime, Sweet (*Citrus limetta*), Mitha nimbu

The fruits are sweet but also sufficiently acid to be very refreshing. Treatment the same as for the lime.

### Mulberry, Indian (*Morus indica*), Toot, Shaloot

The fruits look like stumpy, blackish-red catkins. They are rather flavourless but are good in pies and stews if a tablespoon of red current jelly or a similar tart jelly is mixed with them in cooking. Easily grown from cuttings which will bear in about 2 years or so. Fruits in the spring. Do not let the tree form excessive leaf growth at the expense of the fruit, and thin out crowding branches.

## FRUITS

*Morus niger*, the European mulberry, does not do well in India as a rule, although it is occasionally found in the hills. *Morus alba* has a white insipid fruit, and is grown mainly for its leaves which are used to feed silkworms.

### Orange (*Citrus aurantium*), Narungi

Oranges are cultivated on a large scale in Sylhet and Nagpur. These are all loose-skinned types, sometimes lacking flavour but very juicy. The Nagpur Santra orange grown in the Central Provinces also has a loose skin. The Mosambi oranges of Bombay and the Malta Blood oranges have tight skins, and grow well in various parts of the Deccan and in the Punjab. The Mandarin, Navel, Jaffa, and Seville bitter marmalade oranges may be grown on the hills but are seldom seen on the plains except in experimental gardens.

Oranges in India are usually propagated by budding on to sweet lime or pomelo stocks which will bear in 2 or 3 years; or they can be grown from seed, the seedlings taking longer to come into fruit. The young trees are usually placed 16 to 18 feet apart. After shaping the bush to make a good frame, oranges need very little pruning beyond keeping the frame clean by cutting out dead wood and blind shoots. Should die-back of the shoots occur, cut back to live wood. The fruits ripen about nine months after flowering.

Good drainage is essential and the ground about the trees must be well forked and cultivated. Yearly doses of well-decomposed cow manure should be dug in at the beginning of the rains, and some growers suggest forking 1 lb. superphosphate round each tree two months before fruiting time. Spray with Bordeaux mixture once a year in June.

### Papaya, Papaw or Papeeta (*Carica papaya*)

This is a small, fast-growing tree with much-split leaves. The fruits are round or pear-shaped, dark green while young and turning to yellowish green when ripe, with orange-coloured flesh and black seeds. The fruit contains papain, a digestive enzyme, which makes it of value medicinally.

There are three types of trees: males, which have clusters of flowers on stalks and bear no fruit; females, whose flowers appear on the main stem and bear fruit; and hermaphrodites or bisexual trees, which sometimes bear good fruit. It is impossible to tell the sex of a tree until it flowers, when it is advisable to retain the females and only one or two males.

## THE GARDEN IN THE PLAINS

Owing to cross fertilization the fruits vary in size and shape. Some are long and pear-shaped, others small and round, some have many seeds, others few.

The papaya only thrives under tropical conditions and dislikes frost and cold. Good drainage is essential and a fairly rich soil. There should be 9 or 10 feet between trees. Easily grown from seed. Fruits are produced when plants are about a year old, and will appear on and off throughout the year. After about 4 or 5 years the trees become exhausted and need replacing. When re-planting it is advisable to choose a fresh site for the new trees.

Should there be many fruits in a cluster, cut out a few to improve the quality of those that remain. The fruit should be pulled when full-size but green, and allowed to ripen off the tree. A fruit will keep only a few days after ripening.

### Passion Fruit, Granadilla (*Passiflora edulis*)

A perennial climber usually seen in the hills and in the cooler plains districts. It has an oval fruit the size of a large egg, green when young, the skin of which shrivels slightly and turns a dark purple as it ripens. Inside the wrinkled case is a sweet and juicy pulp mixed with many small seeds. The seeds can be strained away although they are usually swallowed without ill effects. If conditions are suitable for its culture this plant should be grown, for the fruit has a very subtle flavour and makes a delicious cold sweet or a cake-filling or icing.

The plant needs support, and the best method is to erect a sort of pergola with old rails or pipes as posts, 7 or 8 feet above ground, in a double row. Strands of thick, firm galvanized wire should be arranged along the tops of the two lines of posts, and criss-crossed in a network between the two rows. The network should be taut but with an open mesh, leaving holes 6 inches square. The plants will climb up the posts and over the wire support, the fruits hanging down through the large holes of the mesh so that they are easy to gather from under the pergola. Do not let the climber become too thick, as sunlight is necessary for the ripening fruit. The climber often rambles up a tree, but it is then difficult to pick the fruit.

Propagated by cuttings and by seed, the plant usually bears in about  $3\frac{1}{2}$  years from seed, and sooner from cut-

## FRUITS

tings. The climber will need replacing in 5 or 6 years. Soil ordinary but well cultivated. Protection from wind advisable.

### Peach (*Prunus persica*), *Aru*

In India proper the peach seldom produces the luscious fruit known in Europe, Australia and America. In districts where there is a good cold season, a late monsoon and not too hot a dry period, fine fruit is obtainable, but under tropical conditions the tree does not do well. In places where the climate is favourable, European or American types can be attempted; but in most plains districts early fruiting acclimatized varieties are more satisfactory. The fruits of these make delicious stews and preserves. The fruiting period is in May-June.

Peaches can be grown from the kernels of the fruit, and the seedlings bear in 5 or 6 years. Budded grafts come into bearing sooner.

Soil should be light and well cultivated, and drainage must be good. The trees need planting 18 to 20 feet apart. The peach tree, like many other plants, runs to leaf if it is too deep rooting. To avoid this put a layer of stones over the bottom of the pit before planting the tree to prevent the tap-root from finding its way too far down.

Peaches may be pruned in December after leaf fall. The fruit is borne on one-year wood, so cut back a quarter of the new growth conveniently placed for bearing, so that energy is conserved for the lower buds which will form fruit in the following May. All new growth on the inside of the tree should be removed to keep the frame clear. Root pruning can be resorted to if the tree is shy of blossoming, but should only be attempted by someone with experience.

The plants often winter naturally and drop many of their leaves. If this does not happen, artificial wintering after pruning improves the fruit. This is done by baring the upper lateral roots at a distance of 2 feet or so from the trunk and leaving them exposed for about 10 days. Afterwards the soil is mixed with some bulk manure and replaced.

As regards manuring, apply the good general mixture, recommended in the section on manuring in this chapter, after the trees have been pruned and wintered.

Water copiously while the fruit is swelling. Thin out

## THE GARDEN IN THE PLAINS

some of the fruit if the crop is prolific. The China, Agra and Nickels Large varieties are recommended.

### Pear (*Pyrus communis*), *Naspati*

The pear grows quite well in many parts of India, but although it fruits in the hills, it does not bear well in the plains except in some northern districts. The fruit produced is generally hard and woody and of no use for eating raw, although the pears are nice baked or stewed.

The common varieties are usually propagated by layers or cuttings while the better strains are grafted. Soil light, but rich and well cultivated. Pruning is done during the resting time, the new growth which bears the fruit being pruned back to 9 or 10 inches.

If the plants seem shy of blossoming, it sometimes pays to weight the tips of the branches so that they curve downwards.

### Plantain, Banana (*Musa sapientum*), *Kela*

Strictly speaking, plantain is the name given to varieties which need cooking to be palatable, and banana to the forms which can be eaten raw; in India, however, the term plantain is used to cover both types. Plantains need a warm, moist climate. The soil should be heavy and rich, and the site well drained and protected from strong winds. Full sun is essential.

The plantain is propagated by suckers, planted 10 or 12 feet apart, and the first fruit is obtained 12 to 18 months from the time of planting. The plant will throw out several suckers forming a clump. Each stem dies back after fruiting and should be cut down and the stump removed. A new sucker will take the place of the stem that has died. After 5 or 6 years it is as well to renew the tree completely by planting suckers in fresh ground.

Keep the earth round the tree well cultivated and apply a liberal dose of bulk manure once yearly in the early rains. If a bulk manure is not available, give the general artificial fertilizer mentioned earlier in this chapter. Good varieties to grow are the Champa, Chini Champa, Ram Kela, Martaban, and Cavendish.

### Pomelo, Pumelo, Shaddock (*Citrus decumana*), *Bata-vee nimbu*

This tree grows somewhat larger than most of the citrus

## FRUITS

tribe, and bears big round fruits. There are several kinds, with different coloured flesh. Perhaps fruit with pale pink flesh is best, being more juicy than the dark red kind which is often dry, and sweeter than the white type which is often, although not always, acid.

The pomelo is best propagated by *gootee* grafts which bear fruit in 2 or 3 years. Plant the trees 18 feet apart, and shape them while young as recommended in the section on pruning in this chapter. Spray with Bordeaux mixture every year in June.

A very useful tree, as the fruit is delicious in sweet fruit salads or as a savoury salad. Stalkarts variety, with pale pink flesh, is recommended.

### Pomegranate (*Punica granatum*), *Anar*

The fruit is rather tasteless and consists of many seeds, each covered with a thin coating of edible pulp. It is sometimes grown as an ornamental shrub because of its scarlet flowers and pretty foliage. Plants 12 feet apart.

Propagated by *gootee* grafts or cuttings. The fruit appears in the cold weather, but as it is often eaten by caterpillars, protect the young fruit with muslin bags.

## Medium to large trees

### Avocado Pear, Soldiers' Butter (*Persea gratissima*)

A medium-sized tree suited to tropical climates, producing large pear-shaped fruits in late August and early September. Inside there is one round seed surrounded by firm, buttery pulp of a yellowish colour. Rather an acquired taste, but popular with many people as a salad fruit, eaten with salt and pepper. Propagated by seed or budded grafts.

### Bael, Bengal Quince (*Aegle marmelos*), *Bael*

A medium-sized tree with many spines and a large, round fruit the shell of which is hard and woody. Inside there is a soft pulp which is often used to make a sherbet and is said to have marked medicinal value. Fruits in February-March. Propagated by seed or grafts.

### Black Plum (*Eugenia jambolanum*), *Jambul*, *Kala-jam*

A large tree valued for its timber. In the early rains it bears small purplish damson-like fruits with a stone, useful

## THE GARDEN IN THE PLAINS

for jam and tarts. Ask your supplier for the large-fruited variety. Propagated by seed or grafts.

### Litchi (*Nephelium lichi*), *Lichu*

A medium-sized tree with dense, dark foliage, bearing clusters of small red fruits in May, which turn brown after picking. The fruit is the size of a plum or small egg with a rough, thin skin, and is filled with opaque blue-white jelly surrounding a black seed. The flavour is very subtle and delicious. This tree does not thrive in places where there are frosts.

Propagated by *gootee* grafts which bear in about 5 years. Allow 20 to 25 feet between trees. If the disease known as 'Litchi rust' appears, recognizable by the brown, scorched looking leaves, cut off the affected small branches. Water the tree heavily as the fruit forms.

### Loquat, Japanese Medlar (*Eriobotrya japonica*), *Lakut*

A medium- to large-sized tree with handsome foliage, bearing fragrant flowers followed by small, round, yellowish fruits in March-April. Water copiously while the fruit is forming. Ask for the small-seeded varieties. Propagated by *gootee* grafts which bear in about 3 or 4 years. Useful for tarts or jam.

### Mango (*Mangifera indica*), *Am*

The mango is one of the staple fruits of India. The tree is large and will thrive in most plains districts, but a climate with a marked dry season suits it best. Soil deep and well drained. Plant trees 25 to 30 feet apart.

The mango is propagated by inarching, *gootee* grafts, bud grafting or wedge grafting and sometimes from seed. Grafted plants come into bearing in 4 or 5 years, and the seedlings in 10 or 11 years. The tree requires very little pruning beyond shaping while young and keeping the frame clear of dead wood. If the tree obstinately refuses to fruit for several years after it should have done so, and special manuring has failed, root pruning can be resorted to.

Mangoes vary tremendously in flavour. Some have a definitely nasty taste of turpentine with stringy flesh, while others have smooth flesh and a most delicious flavour. As a rule it is not possible to distinguish the good-flavoured

## FRUITS

varieties from the bad by the appearance of the fruit, although the smell is a rough guide. There are many varieties which differ in flavour, size, the time of year they fruit, and the districts to which they are best suited. The Langra mango of the United Provinces and the Alphonse of Bombay are well-known varieties, but it would make a lengthy list if representatives of all types were mentioned. It is better to leave the selection of a suitable variety to your supplier who will know your district and its climatic conditions.

### Sapota, Sapodilla, Naseberry (*Achras sapota*), *Sapota*, *Chikoo*

A medium-sized, symmetrical tree. An even, moist climate suits it best. Good drainage is essential. Trees 18 to 20 feet apart. The fruit is roundish and russet brown in colour. Inside there is a soft light brown pulp and some black seeds. When fully ripe the fruit is thought to be very delicious by some people. There are usually two crops a year, in the spring and again in the autumn. Best propagated by grafting,

PART SIX  
  
 MISCELLANEOUS  


Chapter xxiv  
FROM THE GARDEN TO  
YOUR TABLE

'Such sweet jams meticulously jarred  
As God's own Prophet eats in Paradise.'

J. E. Flecker : *Hassan*

FOR bottling fruit it is best to buy proper preserving jars which can be obtained from most large stores. Ordinary screw-top jars do very well for jam provided they are sterilized before use and are not cracked or chipped. To sterilize, put the jars without their lids in a large saucepan and cover them with cold water. Bring the water slowly to the boil and continue boiling for a few minutes. Remove the pan from the fire, and when the water has cooled enough remove the jars. They can be dried upside-down on a rack in a cool oven with the door ajar.

Only wooden spoons should be used for skimming jam. To test whether jam is ready for bottling, pour a little on to a plate, let it cool, then draw your finger across it. If the divided jam does not run together, it is ready. When filling the jars stand them on a cloth wrung out in hot water.

Line the inside of the lids with a double layer of grease-proof paper cut to fit. Old lids are sometimes slightly perforated, and a good way of ensuring that the jars are air-tight is to pour half an inch of clean melted candle wax on top of the jam before screwing down the lid. When the jars are opened the wax can be taken out in one solid piece if loosened

## THE GARDEN IN THE PLAINS

round the edge with a knife. Another method is to paste melted beeswax outside and round the lid. Instead of using a lid, the jars can be sealed with a double layer of grease-proof paper cut in circles and tied down firmly round the neck of the jar. The inside paper is dipped in milk, brandy or white of egg, while the outer piece is merely damped slightly.

## RECIPES

### Bananas

#### Pie

|                                   |                                  |
|-----------------------------------|----------------------------------|
| 3 or 4 bananas, according to size | $\frac{3}{4}$ cup boiling water  |
| $\frac{3}{4}$ cup sugar           | $\frac{1}{4}$ teaspoon vanilla   |
| 1 tablespoon butter               | 5 tablespoons sugar              |
| 2 eggs (3 if very small)          | pastry                           |
| pinch of salt                     | red currant jelly for garnishing |
| 1 cup flour                       |                                  |

Line a  $5\frac{1}{2}$ -inch pie-plate with good short-crust pastry, and flute the edge. Place a piece of grease-proof paper on the pastry covered with grains of rice. Bake until cooked, then remove rice and paper (the rice is to prevent the empty pastry shell from rising). Cream the butter and  $\frac{3}{4}$  cup of sugar together. Add beaten egg yolks and pinch of salt, then the sieved flour and boiling water. Cook over slow heat until thick. Cool; add vanilla. Peel and slice the bananas and fill the pastry shell with alternate layers of banana slices and the cream filling. Make a meringue with the beaten egg whites and the 5 tablespoons of sugar. Pile on top of the pie and brown in a very slow oven. Garnish with small cubes of red currant jelly. Serve cold.

*Sauce for pudding.*—Boil  $\frac{1}{4}$  lb. sugar with  $\frac{1}{4}$  pint water for 10 minutes. Pulp 3 or 4 bananas and add to them 1 tablespoon lemon juice, or a little sherry. Beat 2 eggs with a pinch of salt and add them to the bananas. Pour the hot syrup over this mixture and heat again for a minute or two without boiling. Beat well and serve hot.

### Beetroot

*Pickle.*—The following recipe makes a useful ingredient for a dish of mixed hors d'œuvres. Wash 6 medium-sized beets and bake them for two hours or until tender. Remove

## FROM THE GARDEN TO YOUR TABLE

the skins carefully, then cut into small cubes. Meanwhile boil 1 pint vinegar with  $\frac{1}{4}$  oz. whole peppers,  $\frac{1}{4}$  oz. allspice,  $\frac{1}{4}$  oz. cinnamon, 2 cloves and 3 tablespoons brown sugar. When cold, strain off cloves and pepper, pour the liquid over beet cubes, and bottle. Do not use for two or three weeks.

### Soup

|                                                               |                 |
|---------------------------------------------------------------|-----------------|
| 1 large, cooked beet, sliced                                  | 1 onion, sliced |
| 1 oz. flour                                                   | 1 oz. butter    |
| 1 stick shredded celery (a pinch of celery salt if no celery) | seasoning       |
| 1 quart stock                                                 | a little milk   |

Melt the butter, add flour and stir. Add stock and boil. Add vegetables and cook gently until tender. Add seasoning, sieve, then add a little hot milk. Serve with a dot of cream on top of each portion. Enough for four people.

### Cape Gooseberry (*Tipparee*)

*Jam.*—Take 1 lb. sugar and 1 ripe lime to every lb. of fruit. Prick each berry with a fork. Boil fruit and lime juice with  $\frac{1}{2}$  cup of water gently for 7 minutes. Add the sugar very gradually and boil quickly for  $\frac{3}{4}$  hour. Stir and skim constantly. Pour into jars and seal.

### Carambola (*Averrhoa carambola*)

*Jam.*—Pare the ridged edges off the fruit, and then cut it into small chunks about 1 inch thick. To every 5 lb. fruit add 3 pints water. Boil for about 20 minutes or until tender. Then add 4 lb. sugar to every 5 lb. fruit, and boil for 20 to 25 minutes. The seeds improve the flavour.

### Guava

#### Cheese

|          |                     |
|----------|---------------------|
| 6 guavas | 2 cups sugar        |
| 1 lime   | 1 tablespoon butter |

Cut guavas into small pieces, add a little water and boil. When soft strain through a coarse sieve and mix with sugar and lime juice. Boil about 2 hours stirring constantly. Add butter. When cold the mixture should have set enough to cut like soft cream cheese.

*Jelly.*—Cut fruit into small pieces but do not remove the skin. Pour over enough water to cover, and cook until soft. Strain through a cloth, squeezing out all the juice.

## THE GARDEN IN THE PLAINS

To 4 cups juice add 4 cups sugar and the juice of a ripe lime. Boil until thick, and bottle, after testing jelly on a cold plate.

### Indian Corn (maize)

*Fritters.*—Parboil the corn on the cobs in water for  $\frac{1}{2}$  hour, then drain off the water and continue boiling in milk with a little water until tender. Cut away the corn from the cobs. There should be about  $\frac{3}{4}$  pint of corn. Add 1 teacup flour,  $\frac{1}{4}$  teaspoon *paprika*, 1 teaspoon baking powder, and the beaten yolks of 2 eggs. Fold in the stiffly beaten egg whites. Fry by the spoonful in very hot lard. Drain on paper before serving.

### Soup

|                                                    |                               |
|----------------------------------------------------|-------------------------------|
| $\frac{3}{4}$ pint corn, as boiled<br>for fritters | salt and pepper<br>1 egg yolk |
| $1\frac{1}{2}$ pints stock                         | 1 dessertspoon parsley        |
| $\frac{3}{4}$ pint milk                            | 1 dessertspoon cornflour      |

Simmer the boiled corn in the stock for 10 minutes. Rub through a sieve and return to the pan. Mix the cornflour with cold milk, then add to the stock and stir until boiling. Add parsley chopped finely and seasonings. Remove from the fire and add beaten egg yolk. Garnish with toasted sippets or puffed rice. Serves four or five people.

### Lemons or limes

#### Lemon curd

|                                                        |                                          |
|--------------------------------------------------------|------------------------------------------|
| 2 lemons, grated rind and<br>juice (3 lemons if small) | $\frac{1}{2}$ lb. castor sugar<br>3 eggs |
| 3 oz. butter                                           |                                          |

Put lemons, butter and sugar into a jar and stand in a saucepan of boiling water. Beat up the eggs and add them to the mixture. Stir until it thickens (about 20 minutes). Bottle in small jars.

#### Marmalade

|                          |
|--------------------------|
| 5 ripe lemons            |
| 3 pints water            |
| $3\frac{1}{2}$ lb. sugar |

Cut the lemons into fine slices, and soak overnight. Boil  $1\frac{1}{2}$  hours, then add sugar and boil another  $\frac{1}{2}$  hour. Bottle.

## FROM THE GARDEN TO YOUR TABLE

### Syrup

|                                                                         |
|-------------------------------------------------------------------------|
| $2\frac{1}{2}$ pints lemon juice (about 26 lemons, or more<br>if small) |
| 3 lb. lump sugar                                                        |
| 1 good teaspoon tartaric acid                                           |

Pare the lemons carefully to avoid the white pith. Bring juice and sugar to the boil for 3 minutes. Add tartaric acid and stir well. Pour this over the peel and stand for a day. Strain and bottle.

*Bottled lime juice.*—1 cup lime juice to 1 cup sugar. Boil 10 minutes, then bottle.

### Lovi-lovi (*Flacourtia inermis*)

*Jelly.*—Boil the fruits well until soft, taking the scum off as it rises. Strain off the juice through a coarse muslin cloth. Add 2 pints sugar to 1 pint juice, and boil until it jellies when tested on a cold plate.

### Mango

#### Chutney

|                                |                    |
|--------------------------------|--------------------|
| 1 lb. green mangoes            | 2 oz. dry ginger   |
| 1 lb. demarara sugar           | 3 garlic cloves    |
| $\frac{1}{4}$ lb. stoned dates | 1 oz. dry chillies |
| $\frac{1}{2}$ lb. sultanas     | 1 pint vinegar     |
| 2 oz. almonds                  | pinch of salt      |

Peel the mangoes, slice from the seed and cut into small pieces. Chop sultanas, dates and blanched almonds. Grind garlic, chillies and ginger. Mix all with a pint of vinegar and boil for 25 minutes, stirring constantly.

*Fool.*—Skin 6 green mangoes and cut from the seed. Boil about 1 hour in  $\frac{1}{2}$  pint of water. When cooked cool and put through a coarse sieve. There should be 2 cups of juicy pulp. Make a custard of 2 big eggs,  $\frac{1}{2}$  pint milk, and 4 tablespoons sugar. Blend the custard thoroughly with the fruit pulp, and serve very cold accompanied by sponge fingers. Enough for 3 or 4 champagne glasses.

Another method is to mix the sieved pulp with an equal quantity of lightly whipped cream and a little sugar, or else add  $\frac{1}{2}$  cup milk and 2 tablespoons sugar to 1 cup mango pulp.

### Melon

*Jam.*—Peel and cut the fruit into chunks, sprinkle with a little sugar and leave overnight. Weigh the fruit, and

## .. THE GARDEN IN THE PLAINS

allow 10 oz. sugar to every lb. of fruit. Put sugar and melon into a pan and bring slowly to the boil. Meanwhile take 1 ripe lemon to every lb. of fruit. Pare thinly, throw the peel into a saucepan of hot water to boil until soft. Squeeze lemon juice and add to the melon. When the rinds are soft, add to the jam together with  $\frac{1}{2}$  teaspoon of ground ginger to every lb. fruit. Boil until the jam is a clear golden-brown colour.

*Salad.*—Cut melon into cubes. Mix with a French dressing and serve on a bed of lettuce leaves. If lettuce is not available, serve in individual salad bowls and garnish with thin slices of cucumber. This is a good accompaniment to a cold fish course.

### Onions

*Pickled.*—Peel enough very small round onions to fill three-quarters of a pint-size preserving jar. Put these onions into a bowl, sprinkle them with a little salt, pour over some cold water and leave to soak for 2 days. Pour off the water, strain thoroughly, and put the onions into the jar. Take enough vinegar to fill the jar. Bring to the boil in an enamelled saucepan. Add a heaped teaspoon brown sugar,  $\frac{1}{4}$  teaspoon mixed spice, and three small red chillies. Pour the hot spiced vinegar over the onions in the jar. Seal, and keep three weeks before using.

*Savoury.*—When vegetables are scarce, the following savoury can be passed as a vegetable with roast mutton or beef. Grease a small baking dish with a little butter. Prepare some sieved white breadcrumbs and some sliced half-cooked onions. Put a layer of breadcrumbs in the dish, then a layer of sliced onions, and so on until the dish is full, finishing with a layer of breadcrumbs. Dissolve a small teaspoon of Marmite in a little hot stock. Pour enough of this liquid into the dish to moisten the contents without making the dish at all sloppy. Dot the top with butter, and brown in a slow oven.

### Orange

#### *Sweet orange marmalade*

1 dozen oranges  
2 lemons  
sugar

Slice the oranges and lemons and put into a bowl with 3 pints of water to every lb. of fruit. Let the fruit stand

[ 400 ]

## FROM THE GARDEN TO YOUR TABLE

for 24 hours. Boil in the same water for 5 minutes, then pour into a bowl to stand for another 24 hours. Weigh, and to every 1 lb. fruit add 1 lb. sugar. Boil until a clear golden colour.

*Orange preserve.*—To be used as a dessert in place of ordinary stem ginger.

25 oranges  
9 lb. sugar  
6 pints water

Grate the rinds of the oranges slightly, then soak in plenty of water for 24 hours. Throw water away, add fresh water, and after cutting the oranges in half, boil slowly for 15 minutes or until the pips come away easily. Throw away water again. Make a syrup of the sugar and 6 pints water, boil and skim until the sugar dissolves and the syrup is fairly thick. This will take about 4 hours of very slow boiling. Throw in the halved oranges and boil again for 3 hours. When done, the syrup is thick and a golden orange colour. While hot put into jars and seal.

A long process, but an excellent preserve for those people who like sweet things.

### Passion Fruit

*Cake filling.*—Add the pulp of 6 passion fruits to 1 gill thick cream, 1 tablespoon sugar, and 1 white of egg beaten stiffly.

*Butter icing.*—Cream 4 oz. fresh butter with 10 oz. icing sugar. Add 2 tablespoons passion fruit pulp without the seeds.

*Jam.*—Cut fruit in halves, scoop out juice and seeds into one basin, and put the shells in another with a pinch of salt and cover with water. Leave for about 12 hours. Boil the shells for nearly an hour. Throw away the outer skins. Sieve the juice in the other bowl and throw away the seeds. Combine the remainders from both bowls, weigh, and to every 1 lb. fruit add  $1\frac{1}{4}$  lb. sugar. Boil for half an hour.

*Fool.*—The sieved pulp blended with sweetened whipped cream, or with custard (as for Mango Fool) makes a delicious sweet.

### Peaches

*Bottled.*—Split the peaches in half, and scald them to remove the skins. Arrange the halves in clean and dry

[ 401 ]

## THE GARDEN IN THE PLAINS

bottles. Make a syrup of 6 oz. loaf sugar and  $\frac{1}{2}$  pint water, and boil for 10 minutes. Fill up the bottles with the syrup. Screw on the lids of the bottles, then place them in a deep preserving pan, and pour in cold water up to the necks of the bottles. Put a lid over the pan and stand it on the fire until the water boils. Remove from the fire and let the bottles remain in the water until it is cold.

**Brandied.**—Pare some half-ripe peaches, cut in half and take out the stones. Make a syrup of 7 oz. sugar and  $\frac{1}{2}$  pint water, for every 6 whole peaches. Boil syrup for 10 minutes, then add the peaches and stew gently for 10 minutes, stirring them constantly. Pour off the syrup and boil it quickly alone for 10 minutes to reduce it. Put the peaches and syrup into glass jars which they should only half fill. Boil some of the peach kernels until fairly tender, and add 8 to each jar. When the peaches are quite cold fill up the jars with good brandy to within half an inch of the brim. Cover closely and seal.

A delicious party sweet is made by draining the brandied peaches well and placing half a peach *en surprise* in the centre of each individual *bombe* of vanilla ice cream.

**Jam.**—Skin and stone the fruit, then weigh it. Allow 5 lb. of sugar to every 6 lb. of fruit. Put the fruit alone in a preserving pan, and barely cover it with water. Cook slowly for just over an hour. Add the sugar and a pinch of cinnamon powder. Cook for about half an hour longer.

### Pineapple

**Nectar.**—Pare and remove the eyes from a ripe pineapple. Grate on a coarse grater, add to each pint of pulp 1 pint water. Press through a sieve, and to each pint of juice, add  $\frac{1}{2}$  lb. sugar boiled to a syrup with  $\frac{1}{4}$  pint water. A sprig of mint can be put in the boiling syrup for a minute to flavour it. Cool, then add the whipped white of one large egg (2, if very small). Beat thoroughly and place on ice until time to serve.

#### Pineapple and Cucumber salad, jellied

|                                                |                                                           |
|------------------------------------------------|-----------------------------------------------------------|
| 1 cucumber, chopped                            | 1 tablespoon tarragon                                     |
| $1\frac{1}{4}$ tablespoons granulated gelatine | vinegar                                                   |
| $\frac{1}{4}$ cup cold water                   | $1\frac{1}{4}$ cups crushed pineapple (previously cooked) |
| $\frac{1}{4}$ cup boiling water                | pinch of salt                                             |
| $\frac{1}{4}$ cup sugar                        | mayonnaise dressing                                       |
| $\frac{1}{4}$ cup vinegar                      |                                                           |

## FROM THE GARDEN TO YOUR TABLE

Pare and chop cucumber. Soak gelatine in cold water, add boiling water and dissolve. Add sugar and stir until melted. Add vinegar, lemon juice and salt. Allow liquid to cool until it is just beginning to set, then stir in the chopped cucumber and pineapple. Turn into individual moulds and chill. Serve on thinly cut circles of cucumber or on lettuce leaves. Garnish with mayonnaise.

**Note:** If fresh pineapple is used in a gelatine mixture it must be cooked before being added. Cooking destroys the enzyme present in pineapple which prevents a gelatine mixture from stiffening.

### Pomelo

**Salads.**—Pomelo is good in either sweet or savoury salads. Shredded and sweetened it forms a useful ingredient of a fruit salad. Shredded and mixed with a French dressing it is a tasty accompaniment to cold chicken.

### Pumpkin

#### Jam

|                         |                                        |
|-------------------------|----------------------------------------|
| 2 lb. pumpkin           | 4 cloves                               |
| 1 oz. root ginger       | 2 pieces cinnamon bark, each           |
| $\frac{1}{2}$ lb. sugar | 1 inch long, or $\frac{1}{2}$ teaspoon |
|                         | powdered cinnamon                      |

Cut pumpkin into small pieces. Sprinkle with sugar, and leave to stand 24 hours. Cut the ginger into very small pieces and add to the pumpkin together with the spices. Boil all together for 2 hours. Remove the cinnamon bark and cloves before putting into jars.

The quantities of ginger and spices can be reduced should these flavours be disliked.

### Rozelle

**Jam.**—The fleshy calyces of the rozelle are known as the 'fruit'. Wash 6 lb. unripe rozelles, cut open and remove the centres. The weight of the remaining fleshy calyces will be about 3 lb. Add 2 cups of water and cook until reduced to a pulp (about 1 hour). Cool, then measure the fruit and add 1 cup sugar to every cup fruit. Cook for 20 minutes.

### Tomato

These recipes are a good means of using up a surplus of green tomatoes in the garden.

## THE GARDEN IN THE PLAINS

### Jam

7 lb. green tomatoes      6 lb. loaf sugar  
6 ripe lemons (9 limes)   6 oz. glacé ginger

Scald and peel tomatoes. Wash and dry lemons, then grate the rind and extract the juice. Put tomatoes, lemon rind and juice into a preserving pan. Add sugar. Stir over a low fire until the sugar is dissolved, then add sliced ginger. Bring to the boil, continuing until the jam jellies when tested on a cool plate. Makes between 8 and 9 lb. jam.

### Pickle

10 lb. green tomatoes,      ¼ oz. cinnamon  
sliced                              ¼ oz. peppercorns  
1 lb. finely sliced onions    ⅛ oz. cayenne pepper  
2 lb. brown sugar              2 quarts vinegar  
½ oz. cloves

Slice the tomatoes, sprinkle them lightly with salt, and allow to stand 12 hours. Drain well, then simmer with the other ingredients for about 1½ hours. Bottle and seal.

### Vegetable marrow

#### Pickle

1 large marrow              1½ oz. turmeric powder  
salt                              6 peeled and sliced onions  
2 quarts vinegar              2½ tablespoons dry mustard  
3 small cups moist sugar   2 tablespoons flour  
1 tablespoon mixed spice   a little extra vinegar

Peel marrow, extract seeds and pulp and cut into small cubes. Spread on a plate, sprinkle with a little salt, and leave to stand 12 hours. Drain well. In an enamelled saucepan warm the 2 quarts vinegar, add sugar and stir until dissolved. Add spice and turmeric. Add 7 lb. of marrow, and the peeled and sliced onions. Boil for 20 minutes, then remove from the fire. In a basin mix the mustard and flour with a little extra vinegar. Stir into the marrow and boil again for 5 minutes. When cooled put into jars and seal.

## Chapter xxx

# CUT FLOWERS FROM TREES, SHRUBS AND CREEPERS

'Flowers should be hit and punched and strangled into shape. It is useless to drift round the house with a lily in one hand and a geranium in the other, and a Mona Lisa smile on your lips.'

Beverley Nichols: *Down the Garden Path*



Flower arrangements and vases—How to keep flowers fresh—Flowers from trees, shrubs and creepers.

So many flowering plants are disappointing because their blooms close up or fall on being cut and arranged in vases; allamandas droop, *Petrea* falls at once, and so on. There are quite a number, however, that last a day or two in water, and these are particularly valuable in the hot weather and rains when the annual flower garden has perished.

### Flower arrangements and vases

Every woman has ideas on arranging flowers, but my experience has been that bright flowers from tropical trees or shrubs look their best in simple bowls or jars of green, cream, or white modern pottery ware, in jugs of dark terra-cotta pottery, or in ordinary porridge-coloured ginger jars. Pale, frothy flowers look cool in crystal or clear green glass bowls, while bronze leaves or rust-red flowers are rich and vivid in jars of copper or brass. Very few tropical flowers seem to be suited to the slender silver or crystal 'specimen' vase.

## THE GARDEN IN THE PLAINS

In the large, bare rooms of plains houses one or two big jars or bowls are preferable to many small vases. Shallow bowls interfere less with conversation than tall vases in the centre of a dining table, although on formal occasions the white china cornucopias, or the big shells, which have returned to favour in modern decoration, can be both dignified and spectacular if filled with the right flowers.

Plain glass battery jars, and 'witch' bowls, faintly iridescent or pastel tinted, have been popular for some time. Plumes of feathery grasses or sprays of rust-red *Holmskioldia* in a smoke-tinted bowl are specially decorative.

A glass bowl of mixed ferns, gracefully arranged and placed where a beam of light can filter through the fronds, is unusual and very cool looking. Another uncommon effect is achieved by an arrangement of light branches from different kinds of evergreen shrubs, a few narrow lily leaves, and leafy sprays from creepers that are not in flower. The charm of this treatment rests in line and contour, for apart from a few russet-tinted leaves, perhaps, there is no bright colour at all. Variety can be introduced by means of flowering grasses, curiously shaped seed heads, or berries. These greenish arrangements should be placed in the light, otherwise the leaves look dull and almost black.

The vivid blooms from tropical trees and shrubs lend themselves to interesting combinations and contrasts in colour, but they also look spectacular massed boldly in one shade, or in different tones of one colour range.

Many flowers look brighter without their leaves. The bougainvillea is a case in point, for the leaves soon go limp and dull, and if they are left on the spray the colourful effect is dimmed.

## CUT FLOWERS FROM TREES, SHRUBS AND CREEPERS

An ordinary earthenware flower pot is a good shape for cut flowers, and can be made quite attractive by painting the outside white or off-white with several coats of distemper. The pot must be rendered watertight by plugging the drainage hole and covering the bottom with a thin layer of cement mortar. Then give the whole interior three or four coats of enamel in white or dark green. A graceful wicker basket with a hidden bowl of water within is another way of displaying cut flowers.

### How to keep flowers fresh

Flowers should always be picked in the early morning even if not wanted until the evening. They can be kept fresh all day in a tub of water. An extra precaution is to hang wet towels on a wire or wicker 'cage' (such as is put over a *sigri* for drying clothes in the monsoon) and place the 'cage' over the tub.

Flowers keep longer if the foliage is stripped off the bottom of the stems for about 4 inches, and the ends plunged in boiling water for a minute or two before putting the sprays in their vases. The hot water seals the ends of the stems, preventing loss of sap. It is generally believed that half an aspirin tablet or a piece of charcoal in the water aids flowers to keep fresh. Soft and stringy ends should be cut off daily.

Below is a list of flowers which last in water for one or more days.

### Flowers from trees, shrubs and creepers

The flowers of trees such as the *Amaltas* (*Cassia fistula*), the *Bauhinia*, the Cotton Tree (*Bombax malabaricum*), or the Flame of the Forest (*Butea frondosa*) arrange well in shallow bowls but they do not last long. The blooms of quite a number of trees

#### THE GARDEN IN THE PLAINS

are effective indoors, but many of them need replacing every day or so.

Standing on the floor of a veranda room, a huge jar of earthenware, copper or brass looks striking if it is filled with the conical red heads of the shrub *Clerodendrons*, *C. urticaefolium*, *paniculatum* or *kaempferi*. The jar must be nearly as large as those used by the 'forty thieves', however, and the flowers arranged lavishly and with long stems.

Other useful shrubs in reddish tones are the bronze-leaved *Acalypha*, the Peacock Flower (*Caesalpinia pulcherrima*) with its orange-red or yellow flowers, or the old-gold berries of *Duranta*.

So many Indian flowers seem to be either red or yellow that it may be rather difficult to think of a suitable decoration for a pastel tinted drawing-room. There are, however, quite a number of mauve or mauvy-blue flowering shrubs which fit in well, such as the pale blue *Plumbago capensis*, or the mauve or white *Pentas*. *Buddleia lindleyana* has mauve flowers which look cool mixed with greyish or pink flowering grasses, or the creamy-flowered *Lawsonia*, but its leaves should be removed as they hang limply.

The crinkly flowers of *Lagerstroemia indica* arrange well when newly open. Sprays of the deep pink variety in cream china bowls, or the mauve or white types in clear green glass or lettuce-green china, look most refreshing on a grilling night. Perhaps the most generally useful flower is that of the ixora. The colour range is wide, the blooms are equally effective set in bowls, jars or baskets, and they last well in water.

The pale green flowers of *Dodonaea viscosa* are insignificant in themselves, but combine well with other flowers. *Montanoa* with its daisy-like sprays,

[408]

#### CUT FLOWERS FROM TREES, SHRUBS AND CREEPERS

the creamy-yellow *Lawsonia*, and the white or mauve *Durantas* are all useful for providing the light note in a bowl of mixed flowers.

Hibiscus is rather disappointing in the house, although the rose-like double and the wide open single hybrids are useful. They differ from most shrubs in looking their best when a few flowers with long stems are grouped in a slender vase.

The poinsettia, in scarlet, pink or pale yellow, is very effective in vases, provided the stems are first plunged into boiling water. If this is not done the sprays will wilt at once. The exact lengths of the sprays must be decided upon before the sealing process takes place, for if the stems are cut again afterwards they will need re-sealing. Poinsettias should be arranged boldly, and each colour looks best alone.

Some of the creepers make lovely decorations of a frothy type. The Sandwich Island creeper (*Antigonon leptopus*) is pretty and light while fresh, but unfortunately it drops soon, especially if fully open when picked. The bridal creeper (*Porana paniculata*) is particularly lovely; while the pinky-red Rangoon creeper (*Quisqualis indica*) blends with most colour schemes: its flowers are scented but not over-poweringly so.

Of the brilliant colours the orange *Bignonia venusta* takes pride of place, although tall jars do not suit the sprays as the bunches of flowers are too weighty for the stems. The lobster claw (*Gloriosa superba*) is another vivid creeper that arranges well in a bowl, the flowers lasting a week in water.

The orange sprays of *Mina lobata* need to be arranged lightly, as do the snowy white or mist blue of the potato creepers (*Solanum jasminoides* and *S. seaforthianum*). Many of these delicate creepers look delightful frothing from the lips of a cornucopia

[409]

THE GARDEN IN THE PLAINS  
are effective indoors, but many of them need replacing every day or so.

Standing on the floor of a veranda room, a huge jar of earthenware, copper or brass looks striking if it is filled with the conical red heads of the shrub *Clerodendrons*, *C. urticaefolium*, *paniculatum* or *kaempferi*. The jar must be nearly as large as those used by the 'forty thieves', however, and the flowers arranged lavishly and with long stems.

Other useful shrubs in reddish tones are the bronze-leaved *Acalypha*, the Peacock Flower (*Caesalpinia pulcherrima*) with its orange-red or yellow flowers, or the old-gold berries of *Duranta*.

So many Indian flowers seem to be either red or yellow that it may be rather difficult to think of a suitable decoration for a pastel tinted drawing-room. There are, however, quite a number of mauve or mauvy-blue flowering shrubs which fit in well, such as the pale blue *Plumbago capensis*, or the mauve or white *Pentas*. *Buddleia lindleyana* has mauve flowers which look cool mixed with greyish or pink flowering grasses, or the creamy-flowered *Lawsonia*, but its leaves should be removed as they hang limply.

The crinkly flowers of *Lagerstroemia indica* arrange well when newly open. Sprays of the deep pink variety in cream china bowls, or the mauve or white types in clear green glass or lettuce-green china, look most refreshing on a grilling night. Perhaps the most generally useful flower is that of the ixora. The colour range is wide, the blooms are equally effective set in bowls, jars or baskets, and they last well in water.

The pale green flowers of *Dodonaea viscosa* are insignificant in themselves, but combine well with other flowers. *Montanoa* with its daisy-like sprays,

[ 408 ]

CUT FLOWERS FROM TREES, SHRUBS AND CREEPERS  
the creamy-yellow *Lawsonia*, and the white or mauve *Durantas* are all useful for providing the light note in a bowl of mixed flowers.

Hibiscus is rather disappointing in the house, although the rose-like double and the wide open single hybrids are useful. They differ from most shrubs in looking their best when a few flowers with long stems are grouped in a slender vase.

The poinsettia, in scarlet, pink or pale yellow, is very effective in vases, provided the stems are first plunged into boiling water. If this is not done the sprays will wilt at once. The exact lengths of the sprays must be decided upon before the sealing process takes place, for if the stems are cut again afterwards they will need re-sealing. Poinsettias should be arranged boldly, and each colour looks best alone.

Some of the creepers make lovely decorations of a frothy type. The Sandwich Island creeper (*Antigonon leptopus*) is pretty and light while fresh, but unfortunately it drops soon, especially if fully open when picked. The bridal creeper (*Porana paniculata*) is particularly lovely; while the pinky-red Rangoon creeper (*Quisqualis indica*) blends with most colour schemes: its flowers are scented but not over-poweringly so.

Of the brilliant colours the orange *Bignonia venusta* takes pride of place, although tall jars do not suit the sprays as the bunches of flowers are too weighty for the stems. The lobster claw (*Gloriosa superba*) is another vivid creeper that arranges well in a bowl, the flowers lasting a week in water.

The orange sprays of *Mina lobata* need to be arranged lightly, as do the snowy white or mist blue of the potato creepers (*Solanum jasminoides* and *S. seaforthianum*). Many of these delicate creepers look delightful frothing from the lips of a cornucopia

[ 409 ]

•• THE GARDEN IN THE PLAINS

or a large shell, although heavier and more handsome blooms are equally effective in such vases if arranged with restraint.

Bougainvilleas are apt to be rather overpowering in a room with other flowers, and their brilliancy needs isolation. Long sprays arranged without their leaves in very large bowls or jars set on the floor, or alone on a table or stand, can be very spectacular. It is as well to seal the stems with hot water before putting the sprays into vases.

Chapter xxvi

BIRDS AND THE GARDEN

‘It must be delightful to be an emerald-hued creature, able to sway on tree tops, with a scarlet flower in your mouth, conscious of your decorative value against a blue sky.’

Kathleen L. Murray: *My Garden in the Wilderness*

PEOPLE often say that there are no song birds on the plains of India. True, the Blackbird haunts the hills only and many songs are harsh, but for all that bird sounds are bound up with an Indian day.

Soon after dawn the Crow Pheasant starts his deep ‘whoood-whoood-whoood’ away in the low scrub jungle that he loves. He is a heavy bird, in keeping with his deep voice, with a black body and chestnut wings, easily mistaken for a pheasant. Later the Mynahs tune up, a cheerful, prosaic sound comforting after a nightmare, but an enemy of late sleeping. The noisy ‘keeky-keeky-keeky-churr-churr-churr-kok-kok’ precedes the early tea and banishes all sleep.

There are persistent birds too, with calls that burrow into one’s brain. The Brain-fever Bird (the common Hawk-cuckoo) is perhaps the most trying in certain districts; his ascending chromatic scale ends shrilly on an almost unbearably hysterical note. As the warm spring approaches his voice is heard in the land, and on those burning, waiting days before the monsoon the Brain-fever seems an agonized appeal for the rain. The Koel, although persistent far into the night, has a more mellow voice. There is an

#### THE GARDEN IN THE PLAINS

excited, expectant note in his repeated call of 'ko-il' rising in a crescendo and his round, liquid tone leads one to expect some heavy, richly coloured bird. Actually the male is comparatively slender and sober black, and his wife a discreet brown-olive spotted with white. They haunt the dim, leafy heights of old garden trees, and because of their inconspicuous colouring are seldom noticed until their calls in the breeding season leave no doubt as to their presence. Koels are of the cuckoo tribe and have the distinction of being parasitic on that rascal, the Common House Crow.

The call of the Green Barbet is one of India's familiar sounds in country districts near jungle. His 'kotur-kotur-kotur' punctuates the day although this green bird with a brown head and swollen bill is seldom seen, lost as he is amongst the leaves of big trees. Another kind of barbet is the Coppersmith, a small greenish bird with a head vividly splashed with colour. The repeated call of 'tonk-tonk-tonk' is one of the trials of the hot weather. It is a hollow, metallic sound that drums on and on at intervals throughout the long hot days.

A bird familiar to all who live in towns is the Common Pariah Kite. Its high-pitched squealing wail joins with the rattle of tea cups in penetrating the haze of an afternoon sleep, and it is a typical morning sound as well. In country districts the soft 'kru-krroo-ku' of doves seems identified with the smoky smell of late afternoon, and at night the Spotted Owlet often chuckles under the eaves or on a tree in the garden.

Nearly all birds who live near human habitations are vain. Beautiful jungle birds are shy and retiring, but quite ordinary garden birds think the world of themselves. Take the little Tailor Bird. He is a small greeny-brown and white fellow with a rusty

#### BIRDS AND THE GARDEN

cap and pointed tail, yet by his penetrating call of 'twee-twee-twee-twee' you would think he was an important bird twice his true size. He flicks his tail up and moves confidently about his business right under the nose of man.

There are several black and white birds fully aware of their good taste in feathers. The Pied Bush Chat, a small black bird with a white abdomen and a white patch on the wings and at the base of the tail, is commonly seen perching high on a shrub or twig. He is very confident and far more conspicuous than his little brownish-grey wife. Perhaps even more 'well-dressed' is the Magpie Robin. This small bird carries his tail high, and chooses the topmost point on a house on which to perch and sing his lovely little song. His plumage is glossy black with white underneath, and two long white shafts on either side of the black in his tail.

Drongos or King Crows are vain birds too. They are pleased with their sleek black tailoring and forked tails, and love to harry birds far bigger than themselves. Excellent mimics, they seem to find great amusement in imitating their fellows. Although noisy with their constant 'wang-chip-chip' they are likeable birds, courageous, and graceful in form.

One often sees a heavy, nondescript bird sitting solitarily on a badminton post or a pergola. He gazes at the ground in a doltish way until the insect of his choice appears. Then comes a flash of glorious light and dark blue barred across his wings and tail, as he flies to his prey. It is the Blue Jay or Indian Roller, a bird common in most parts of India and a never-ending surprise in his change from dull to vivid colour.

Some Indian birds have a fairy-tale quality, the Hoopoe being such a one. He is a fawnish bird with striking bars of black and cream on wings and tail, a

#### THE GARDEN IN THE PLAINS

curved beak and a crest of feathers which he unfurls with a flaunting gesture. He likes to stalk over a lawn in search of insects, commenting on life with a gruff 'uk-uk'. Hoopoes are usually seen in pairs.

The Indian Tree Pie is another exotic bird, coloured pinkish-rust, grey, black and white. He has a long tail which gives his flight a graceful, dipping motion. The usual call is 'cockle-leek', a rather metallic gurgle familiar in leafy gardens as the birds move about the trees in search of insects.

One of the most beautiful sights I have seen was a 150-foot screen of the orange creeper *Bignonia venusta* alive with those green bulbuls that go by the long name of Gold-fronted chloropsis. The sprays of orange-gold flowers dripped downwards like a curtain, swaying with the flutterings of little green birds.

Many small birds are lovely. If Minivets visit a garden they usually arrive in flights, the little scarlet and black males alight on one bush and the yellowish-grey females on another nearby. Among diminutive birds are the Sunbirds. These are tiny little creatures with curved beaks, that like to be busy round flowers. They all have a metallic sheen on their plumage, but some are more variegated in colour than others.

A charming sight is the flash of yellow when a Golden Oriole speeds towards some dark old mango tree. Equally attractive in its way is the grotesque silhouette of a Woodpecker on a tree caught against the sky. His scream is another familiar Indian sound.

Winter visitors are always interesting. A dark little bird with chestnut on the rump and lower abdomen and a jerky tail comes all the way from Tibet. He is the black Redstart, a great lover of gardens. The Grey and Yellow Wagtails migrate south from the far north, and become a familiar sight in the cold weather as they wag their tails and wander

#### BIRDS AND THE GARDEN

over the lawn. They choose a beat near water for preference. The Pied Wagtail is a more or less resident species.

Some birds, although attractive in themselves, are a trial to gardeners. The Bulbuls haunt wild lantana or low scrub jungle and chatter away in sweet, reedy tones apparently harmless enough, yet watch the ornamental berries or the fruit trees in your garden. The green Parakeet is another offender, who will strip the Indian corn from your vegetable plot in no time. In spite of their bad ways, however, a flock of these green birds hurrying to roost in flight across a pale primrose sky is an unforgettable sight.

Birds are a great joy in India. Each one identified is a triumphant discovery and one feels that the garden has become a home for more than flowers.

#### Books to buy

*Popular Handbook of Indian Birds*, by Hugh Whistler. 2nd ed., 1935. 15s. (Gurney and Jackson)

*Indian Birds: A Key to the Common Birds on the Plains of India*, by Douglas Dewar. 6s. (John Lane)

*The Birds of Southern India*, by H. R. Baker and C. M. Inglis. 1930. Rs. 15 (Government Press, Madras)

*Birds of an Indian Garden*, by T. Bainbrigge Fletcher and C. M. Inglis. 2nd ed. 18s. (W. Thacker & Co.)

*The Book of Indian Birds*, by Sálím Ali. 1941. Rs. 14 (The Bombay Natural History Society)

## Chapter xxvii

# GARDEN IMPLEMENTS

‘All tools inevitably planned,  
Stout friends, with pledge  
Of service.’

V. Sackville-West: *The Land*

~~~~~  
A list for easy working—Special tools for special occasions—
Items for the garden store shelf

THE contents of the tool shed should be inspected from time to time as *malis* have a genius for mislaying or breaking things. Keep all tools clean and oiled. The blades of shears and pruning knives will need to be sharpened occasionally.

A list for easy working

The list of tools given below is a full one, but many gardeners manage with far fewer. For instance, *malis* often use pieces of stick in place of tools for forking and scraping, and the syringe used for cleaning a car is perhaps used for spraying purposes, although it is not nearly so satisfactory as a real sprayer. It is just as well to aim at having the proper tools, however, for they make for easy working.

1 hoe

Kodali in Hindustani, *mamooty* in South India and Ceylon. A long shaft with the blade at an angle to it.

1 fork hoe

Kodali or *mamooty* fork. This has three or four prongs at right angles to the shaft.

1 big straight fork

Straight *kodali* fork, with prongs 12 or 14 inches long

[416]

GARDEN IMPLEMENTS

straight in line with the shaft instead of at an angle to it. Useful for deep cultivation round established plants.

1 *saprang*

A wide straight blade on a long handle. Useful for making neat the edges of lawns, for making holes in the ground, and assisting in transplanting.

1 *khurpi*

A small hooked scraper used for weeding paths.

1 *nironee*

A piece of iron with a flattened end used for working the surface of beds. An alternative is a hand fork.

1 *dhao*

A heavy knife for splitting bamboo stakes and lopping small branches.

1 rake

With about 10 teeth. Useful for keeping beds tidy and for loosening surface weeds and dead roots on lawns. A long-handled rake is not always popular with the *malis*, however, as he prefers to squat and work with a short implement.

1 pair gardening shears

With 10-inch blades. For trimming hedges and keeping edging plants neat. Can be used for clipping grass in places where a mower cannot be used.

1 pair border shears

For cutting the edges of lawns. Only necessary where there are large stretches of grass.

1 pruning knife

With a 5- or 6-inch blade curving inwards. For all pruning purposes. Secateurs are sometimes used for pruning thin-stemmed shrubs or roses, but a proper pruning knife makes a much better cut if sharpened from time to time.

1 syringe spray

For keeping foliage clean and applying insecticides to plants.

[417]

THE GARDEN IN THE PLAINS

1 *strong penknife*

1 *small saw*

Useful for cutting down wooden store boxes to make shallow seed boxes, and many other odd jobs in the garden. Sometimes necessary for cutting branches off trees.

1 *pair wire scissors or pliers*

1 *dibble*

A pointed stick used to make holes in moist soil in which to insert seedlings.

1 *small hammer*

1 *trowel*

1 *lawn mower*

It is best to have a good lawn mower if there is a large expanse of grass to keep up, or any kind of games lawn. A good mower may cost anything between Rs. 150 and Rs. 350. For small lawns the cheaper makes, costing from Rs. 35 to Rs. 75, will be satisfactory. Mowers must be sharpened and 'set' from time to time. Always keep a mower clean and well oiled, and train one man to use it intelligently.

1 *light roller*

A light roller, about 2 cwt., is necessary for rolling grass and paths.

Two 2½-gallon watering-cans

With roses or nozzles. Always solder any holes that appear in the cans.

One 1-gallon watering-can

With extra fine rose for seedling work. Special light seedling cans with long spouts are obtainable.

1 *or 2 buckets*

1 *length hose pipe*

Diameter ¾ or 1 inch, with a combination hose jet and sprinkler, and a good tap union. Useful for watering grass and deep-watering beds. Length determined by the distance from the tap to the furthest point to be watered. Armoured or corrugated pipes last longer than plain tubing.

GARDEN IMPLEMENTS

sieves

Consisting of 3 pieces of wire mesh about 36"×24", each piece attached to a light wooden frame about 3 inches deep. The gauges of the mesh of the three sieves should be as follows.

No. 12 mesh for fine work.

No. 6 mesh for medium work.

½-inch wire netting used double for strength, for rough sifting.

strong shallow bamboo baskets

About 15" diameter, and 7" deep at the lowest point. For carrying earth or manure. The wheelbarrow is not liked by the average mali.

Special tools for special occasions

A spirit level may be necessary for levelling tennis courts and special lawns. This can usually be hired from a builder. The series of wooden pegs used for levelling operations can be made by a jobbing carpenter. A builder's tape measure is useful and can be borrowed usually.

A wheelbarrow is useful when transplanting big shrubs, and for carting earth or manure when labour is short. If labour is augmented, extra hoes or baskets for carrying earth may be needed. Should there be no roller on hand, one must be obtained for rolling new lawns and paths.

Shelves for the garden store shelf

affia

A hank or two for staking purposes.

Coir fibre

For lining wire-mesh baskets, and for protecting the roots of orchids, etc.

Thin soft galvanized wire

For all binding purposes connected with wire-mesh work and posts.

Some nails of assorted sizes

THE GARDEN IN THE PLAINS

Labels

These can be bought, but satisfactory labels can be made out of the zinc lining of an old box. Cut strips of the zinc 3×1 inches with a hole punched at one end. There is a special ink for metal labels on the market, or copper sulphate can be used for the purpose. Write the name with a quill pen or a broad 'J' nib.

Wooden labels are often used, and instead of using ink the label can be painted all over with white paint and, while wet, the name printed with a pencil. A label tied on to a plant may damage the stem, so it is better to fix the label to a short stake in the ground near the plant to be identified. Paint the underground part of the stake with tar.

Tar, or earth oil

For painting the underground parts of wooden posts. Earth oil is a vegetable oil and can be bought by weight from any builder.

Green paint

For painting iron posts, arches and so on.

Oil

For oiling the lawn mower, and for cleaning and preserving tools in general.

Empty kerosene tins

These are very useful and should never be parted with, for they may be put to the following uses.

By removing the lid and fixing a bar of wood across the open top a water-carrier is made. A tin halved lengthwise makes two shallow seed pans if the bottoms are given drainage holes. A whole tin with the lid off is excellent for housing ground orchids in the fernery, while a tin halved across the middle forms two fern pots. Tins to hold plants should always have the bottoms pierced for drainage purposes, and the outsides painted green. Empty tins are useful for holding chemical manures, lime, soot and so on.

Empty wooden store boxes

These make excellent seed boxes if they are cut lengthwise, and the bottoms of the two boxes so formed pierced with holes (the lid of the store box is the bottom of

GARDEN IMPLEMENTS

one seed box). The cut boxes should not exceed 7 inches in depth.

Wire mesh

All pieces of wire mesh should be kept. The larger meshes are useful for screens to support creepers. The $\frac{1}{2}$ - to 1-inch mesh is suitable for hanging baskets, and the very fine meshes for sieves.

Pieces of lime concrete

Keep these for use as an ingredient of a good fern compost.

Broken brick or pieces of broken flower pots

Useful for drainage purposes at the bottom of fern pots.

Chapter xxviii

A GARDENER'S CALENDAR

'How well the skilful gardener drew
Of flowers, and herbs, this dial new,
Where, from above, the milder sun
Does through a fragrant zodiac run.'

—Andrew Marvell

IN this calendar it has been assumed that the rains proper begin sometime in June. In districts where the monsoon is late, the programme of work must be modified accordingly.

JANUARY

Last sowing of annuals to flower in the hot season can be made.

Put down small sowing of mustard, cress and radish.

Sow melon seed.

Re-pot and water such bulbous and tuberous plants as have been lying dormant and are now starting new growth, an example being lilies of the Amaryllis group.

Shrubs that flower in the hot months and that benefit by pruning should be attended to now. 'Clean' woody shrubs such as ixora and *Brunfelsia hopeana*. Prune fairly heavily quick-growing shrubs like *lagerstroemia*, *Caesalpinia pulcherrima*, *Argyrea campanulata*, lantana, and straggly shrubs such as *Jatropha panduraefolia*.

Cut back rampant creepers such as *Quisqualis*; prune allamandas, and *Porana paniculata* when it has finished flowering.

Clean tropical fruit trees.

FEBRUARY

Cut back any shrubs that have flowered late in the cold season, should they need pruning, or 'clean' them.

[422]

A GARDENER'S CALENDAR

Sow marrows in successive sowings until early April for hot-season fruiting.

Sow seeds of water melon.

The first potting of chrysanthemums usually takes place from the middle to the end of this month.

Towards the end of the month or in early March plant *Achimenes* bulbs in hanging baskets.

MARCH

Sow seeds of the various gourds and cucumbers early in the month, continuing successive sowings until July.

Sow seeds of egg plant (brinjal) for the autumn crop.

Prune antigonon creeper, ready for a flush in the rains.

Prune poinsettias and *Cassia alata*.

Dahlias, various *Lilium* and such plants that have finished flowering and are about to enter their dormant period should be allowed to die down by withdrawing water, prior to storing their bulbs.

Re-pot such fernery plants as *Alocasia* and *Caladium* that have finished their dormant period and are starting growth.

APRIL

Sow seeds of okra (ladies fingers) and Indian corn (maize).

Start to withdraw water from gladiolus bulbs that will be dying down for their dormant season, prior to storing.

Water litchi trees as the fruit forms.

Hoe up any ground intended for new lawns.

Towards the end of the month seeds of annuals to flower in the early rains can be sown.

MAY

Sow seeds of annuals for rains flowering.

Sow country beans and gourds for monsoon fruiting, in succession.

Sow seeds of rozelle and Cape gooseberry.

The second potting of chrysanthemums can take place now.

Plant cuttings of sweet potato.

Plant ginger rhizomes.

Level new lawns, that have already been hoed into clods.

[423]

THE GARDEN IN THE PLAINS

JUNE

Early in the month put down cuttings of tropical trees and shrubs, giving them water and shade until the rains break.

Layering, the making of gootee grafts, and inarching fruit trees can be undertaken this month.

Divide cannas, and re-plant with the first rain in well-dug and heavily-manured beds.

Sow grass seed for new lawns.

Alternatives to grassing by seed are the various methods of planting grass roots, with the early rain.

Apply top dressings to established lawns.

At the end of the month or early in July divide and re-pot fern-house plants as signs of new growth appear with the rains.

JULY

If flower or vegetable beds need lime, apply it early this month.

The third potting of chrysanthemums should be carried out now.

Inspect stored dahlias to see if signs of sprouting are apparent, with a view to potting.

Late in the month sow seeds of acclimatized cauliflower in succession.

AUGUST

Early in the month dig and manure beds for cool-season flowers and vegetables.

Early in the month sow seeds of *Ipomoea* and such annual creepers that are to flower in the cool season.

Sow seed of celery.

Peaches, limes and oranges can be budded now.

Plant out suckers of pineapples.

Top dressings can be applied to established lawns late in the month, if this has not been done already in June.

SEPTEMBER

The final potting of chrysanthemums can be done now. Sow half the available carnation seed early in the month in an attempt to get the plants established in good time.

[424]

A GARDENER'S CALENDAR

Sow a little of the available seed of cabbage, imported cauliflower, celery, lettuce and parsley, in boxes or protected seed beds.

Sow vegetable marrow in successive sowings until January for dry-season fruiting.

About the middle of the month sow a few cool-season flower seeds in boxes or protected seed beds. Antirrhinum, verbena, aster, pansy and cineraria should be sown now as they take a long time to mature, but must be watched against 'damping off'.

Divide and re-plant violets.

Tip the growth of poinsettia.

Tip antigonon creeper lightly.

Plant freesias in pots or *gumlahs*.

Sow seed of asparagus.

Plant local potato tubers towards the end of the month.

OCTOBER

Sow remainder of the carnation seeds early in the month.

Plant gladiolus bulbs.

Early in the month sow flower seeds for the cool season in boxes or protected seed beds.

Plant further sowings of cabbage, imported cauliflower, lettuce, and tomato in boxes or protected seed beds.

Sow seeds of egg plant (brinjal) for a spring crop.

Bed out dahlias.

About the middle of the month sow flower and vegetable seeds that are to be broadcast direct in the beds outside.

Roses can be pruned about the middle of the month, and cuttings from them put down.

As their leaves die down withdraw water from lilies such as the *Amaryllis*, or fern-house plants like *Caladium*, *Alocasia* and so on, which will be dormant in the cool season.

Repair the top surfaces of paths or drives that have been scoured in the monsoon, and scrape those that have become green and slippery.

NOVEMBER

Continue successive sowings of beans, carrots, peas, kohlrabi, turnips, radish, beet, lettuce, mustard, cress and parsley.

Put down cuttings of such plants that are at their best in the cool season.

[425]

THE GARDEN IN THE PLAINS

Roses can be pruned up to about the middle of November, and cuttings put down, if this has not been done in October.

Plant potato tubers from the hills.

Start to withdraw water from *Achimenes* bulbs, as their dormant period is approaching, prior to storing the bulbs.

Give a top dressing of manure to canna beds.

Transplant any flower or vegetable seedlings that are ready, to the beds in the open.

DECEMBER

Sow seeds for annuals that are to flower in the hot weather.

Transplant any flower or vegetable seedlings that are ready, to the beds in the open.

Prune peach trees.

In cold districts protect young or delicate plants from frost by covering them during the night and in the early morning until the sun has warmed the air.

Late in the month or early January re-pot *Amaryllis* lilies after their dormant period, when signs of new growth appear.

Any new work, such as building a summer-house, making a pergola, and so on, should be carried out in this comparatively quiet month in the garden.



INDEX

- Abronia*, 265
Acalypha spp., 138, 196; *A. sanderiana*, 152
Acanthus ilicifolius, 239
Achania malva-viscus, 196
Achimenes, 210, 222
Acorus calamus, 239
Acrolinium, 260
Adam's Needle, 179
Adenanthera spp., 129
Adiantum spp., 209, 210
Adrakh, 372
Aerides spp., 349
African Violet, 213
Agave spp., 221; *A. americana*, 179
Ageratum, 250
Aglaonema, 211
Ajmur, 364
Algae, 225
Alkadoo, 370
Allamanda spp., 23, 140, 154, 159, 164; *A. aublettii*, 162; *A. schottii*, 15, 27, 238
Alocasia spp., 211, 222
Aloe spp., 221; *A. abyssinica*, 179
Alternanthera, 200
Alu, 364
Alyssum, 29, 221, 250
Am, 390
Amarantus tricolor splendens, 261
Amaryllis lilies, 222, 237, 273, 275
Amherstia nobilis, 120
Amomum magnificum, 154
Ampullaria, 225
Amrood, 383
Ananas, 380
Anar, 389
Angelonia spp., 268
Angel's Trumpet, 153
Angoor, 382
Animal pests, 101
Annual Flower Garden, The, 245-270
Annuals, cold weather, 250; hot weather, 260; for pot work, 265
Anthurium spp., 211, 222
Antigonon spp., 23, 159
Antirrhinum, 24, 247, 250
Ants, 108
Apluda aristata, 177, 211, 222
Aponogeton distachyum, 239
Aquatic plants, 229, 239
Aralia spp., 139
Arches, 49
Arctotis, 261
Areca lutescens, 238
Arenga saccharifera, 173
Argyreia campanulata, 138, 141
Artichoke, Globe, 359; Jerusalem, 359
Artificial fertilizers, 66-68; for fruit trees, 377; for roses, 291; for sweet peas, 259; for tomatoes, 366

INDEX

Artocarpus spp., 128
Aru, 387
Arundina bambusifolia, 222, 348, 350
Arundo donax variegata, 177, 241
Asclepiadeae spp., 180
 Asoka Tree, 125
 Asparagus, 359; Cuba Bean, 369
Asparagus plumosus, 157, 213; *A. sprengeri*, 210
Asplenium nidus-avis, 209, 237
Aster spp., 266; *A. amellus*, 268
 Ata, 381
 Aubergine, 369
 Australian Bottle-brush Tree, 121, 238
 Australian Silky Oak, 128
 Avenues, trees for, 131
Averrhoa spp., 381, 397
 Avocado Pear, 389
Azadirachta indica, 129
Azolla pinata, 240

 Bael, 389
Bakla sem, 359
 Balsam, 261
 Bamboos, 176, 237
Bambusa spp., 176, 198, 237
 Banana, 388, 396
Banisteria laurifolia, 162
 Bantulsi, 367
Bara sem, 372
 Barbados Pride, 142
 Barberton Daisy, 268
Barleria spp., 150, 196, 214, 222
Barringtonia spp., 239, 241
Bartonia aurea, 251
 Basil, 367
Batavee nimbu, 388
Bauhinia spp., 119, 120, 131; shrubs, 23, 141
 Bean, Broad, 359; Country, 369; French or Kidney, 360; Sword, 372
Beaumontia grandiflora, 24, 162
 Beefwood Tree, 130
 Beet, 360, 396
Begonia spp., 212
Bellis perennis, 251
 Bengal Quince, 389
Bentinckia condapanna, 173
 Bhendi Tree, 126
 Bhindi, 371
 Bhutta, 370
Bignonia spp., 158; *B. magnifica*, 162, 164, 238
 Bilbergia, 222
 Bird baths, 35
 Birds, and the garden, 411-415; books on, 415
 Bird's-nest Fern, 209
 Bird tables, 38
 Black-eyed Susan, 159
 Black Plum, 389
 Blanket Flower, 262
Blechnum spp., 209, 210
 Blue Lace Flower, 252
Bombax malabaricum, 127
Borassus flabellifer, 173, 241
 Bordeaux mixture, 112
 Borers, 108
Bougainvillea spp., 141, 162, 167, 168, 195, 228, 237, 238; *B. formosa*, 141
 Brachycome, 251
 Brinjal, 369

[428]

INDEX

Briza maxima, 177
Browalia alata, 29, 221, 251
Brownea spp., 120
Brugmansia suaveolens, 23, 153
Brunfelsia spp., 141; *B. hopeana*, 138
 Brussels Sprouts, 360
Bryophyllum spp., 221; *B. calycinum*, 179
 Budding, 93; of roses, 300
Buddleia spp., 142, 154, 197
 Bulbs and tubers, storing, 278
 Bulbs for pot work, 273
 Burgundy mixture, 113
Butea frondosa, 127

 Cabbage, 360
 Cacalia, 261
 Cacti, 178-181
Caesalpinia coriaria, 129; *C. pulcherrima*, 23, 98, 142, 150, 154, 237; *C. sepiaria*, 195
Caladium spp., 212
Calathea lindeniana, 154
 Calendar, Gardener's, 422-426
 Calendula, 221, 266
 Californian Poppy, 153
Calliandra spp., 142
Callistemon lanceolata, 121
Calotropis gigantea, 241
Camoensia maxima, 23, 160
Campsis spp., 161
Canavalia obtusifolia, 241
 Candle Tree, 131
 Candytuft, 24, 221, 251
 Cannas, 227, 237, 274, 338-342; a selection of, 342; diseases of, 341; in pots, 340; planting, 339; resting, 340; types of, 341
 Cape Gooseberry, 379, 397
Capparis spp., 142, 154
 Capsicum, 361
 Carambola, 397
Carludovica palmata, 175, 238
 Carnation, 266
 Carrot, 361
Caryota urens, 173
Cassia spp., 121-122, 131; *C. auriculata*, 241; *C. nodosa*, 238; shrubs, 24, 151
Casuarina equisetifolia, 130, 236, 241
 Cattle manure, 58
 Cauliflower, 361
 Celery, 362
 Celosia, 261
 Centaurea, 251
 Century Plant, 179
Ceratophyllum verticillatum, 240
Ceratopteris thalictroides, 240
Cerbera fruticosa, 146
Cereus peruvianus, 179
Cestrum nocturnum, 23, 138, 142
 Chakunder, 360
Chamaerops humilis, 174
 Changeable Rose, 151
Cheilanthes argentea, 209
 Chichinga, 370
 Chikoo, 391
 Chilli, 369
 Chinese Box, 197
 Chinese Forget-me-not, 252
Chonemorpha macrophylla, 162

[429]

INDEX

Chota Kobi, 360
Chrysalidocarpus lutescens, 174, 175
Chrysanthemum, annual, 251, 314
Chrysanthemums, 314-337; a selection of, 335; cascade, 331; disbudding, 320; forms of, 328; in pots, 317; notes on varieties of, 332; pests and diseases of, 334; propagation of, 315
Cineraria, 267
Cissus discolor, 157, 214
Clarkia elegans, 252
 Cleft grafting, 90
Clerodendron spp., 214; climbers, 23, 160, 163; *C. paniculatum*, 150, 154, 222; shrubs, 24, 143, 151; *C. speciosum*, 165
 Climbers and Creepers, 155-171
 Climbers, annual, 166; care of, 157; foliage, 157; for pergolas and arches, 159; heavy, 162; light, for screens, 158; supports for, 155; that flower in cold weather, 165; that like semi-shade, 163; trained as shrubs, 164
Clitoria ternatea, 166
Cobaea scandens, 166
Cochlospermum gossypium, 122
Cocos spp., 173; *C. nucifera*, 241
Coleus spp., 212, 222
Colvillea racemosa, 122
Colville's Glory, 122
 Combretums, 165
Commelina sellowiana, 239
 Compost, 60; pits for, 12, 61; for seed boxes, 77
 Condiments, 372
 Conessi Bark, 123
Congea tomentosa, 24, 165
Cordia sebestena, 122
Cordyline spp., 139
 Coreopsis, 23, 261
 Coriander, 367
 Cornflower, 251
Corypher umbraculifera, 173
Cosmea spp., 252; *C. klondyke*, 262
 Cosmos, 23, 252
Costus igneus, 212; *C. speciosus*, 239
 Cowslip Creeper, 24, 163
 Cream-fruit Plant, 165
 Creeping Tuberose, 161
 Crepe Myrtle, 146
 Cress, Curled or Garden, 362; Water, 362
 Crinum lilies, 222, 237, 274, 275
 Crocus lilies, 222, 237, 276
Crossandra spp., 222; *C. infundibuliformis*, 153
 Croton (*Codiaeum*), 139, 237
 Crown grafting, 91
Cryptostegia grandiflora, 162
 Cuba Bean, 369
 Cucumber, 369; Indian, 369
 Cultivation and watering, 20
Cuphea jorullensis (macrophylla), 143
 Custard Apple, 381

[430]

INDEX

Cuttings, planting of, 82; preparation of, 81
Cyanotis barbata, 222
Cycas spp., 175
Cyclanthus cristatus, 175, 238
Cynodon dactylon, 184
Cynoglossum amabile, 252
Cyperus alternifolius, 222, 228, 238; *C. papyrus*, 228, 238
 Dadap, 127
Daedalacanthus nervosus, 143, 197
 Dahlias, 279-281; as annuals, 279; grown from tubers, 280
 Daisy, 251
Dalbergia sissoo, 130
 Daphnia, 226
Datura suaveolens, 153, 236
Davallia fijiensis, 210
 Delphinium, 268
Dendrobium spp., 350
 Designing the garden, 13
 Dhandoll, 370
 Dhanya, 367
 Dhoo grass, 184
Dianthus spp., 221, 252
Didiscus coeruleus, 252
Dieffenbachia magnifica, 212
 Dill, 367
Dillenia indica, 123
 Dimorphotheca, 268
Diospyros embryopteris, 128, 131
 Diseases, Pests and, 99-113
 Disinfectant solution, 106
 Divi-divi, 129
Dodonaea viscosa, 197, 200
Dombeya spp., 24, 151
Dracaena spp., 139, 212
 Drainage, 55; of lawns, 182
 Dried sludge, 59
 Drives and garden paths, 9
 Dung, 58
Duranta spp., 143, 150, 196, 200
 Dwarf ageratum, 80, 221, 250
Echeveria spp., 180, 221
 Echinocactus, 180
 Echinocereus, 180
 Echinopsis, 180
Echites spp., 162
 Edging plants, 200
 Egg Plant, 369
 Eichornia, 240
Elaeis guineensis, 173
 Elephant grass, 177
 Emulsion, kerosene, 107
 Endive, 362
Epiphyllum truncatum, 180
Eranthemum spp., 139, 153, 214, 222
Erythrina spp., 123, 127
 Eschscholtzia, 253
Eucalyptus spp., 132
Eucharis grandiflora, 274
Eugenia spp., 128
Euphorbia bojeri, 180, 221
Euryale ferox, 240
Euterpe edulis, 175
 Everlasting flowers, 260
Exaecaria bicolor, 140
 'Fairy rings' in lawns, 190
 Feather Grass, 178

[431]

INDEX

- Fennel, 367
 Ferneries and Pot Plants, 201-215
 Ferns, compost for, 204; for water gardens, 237; hanging baskets for, 210; potting, 209; propagation of, 202; watering, 205
 Fern Tree, 128
 Fertilizers, artificial, 66-68
Ficus benjamina, 129; *F. religiosa*, 130; *F. repens*, 157
 Fig, 381
Filicium decipiens, 128, 131
 Fish for a pond, 225
 Fittonia, 222
Flacourtia spp., 382, 399
 Flamboyant, 125
 Flame of the Forest, 127
 Flax, 254
 Flower beds and borders, 11, 245; preparing, 247
 Flower Garden, Annual, 245-270
 Flowering Tobacco, 263
 Flowers, cut, arrangement of, 405
 Formal Gardens, 25
 Four-o'clock Plant, 262
 Franciscea, 141
Frangipani, 148
 Freesias, 274
 Fruits, 373-391
 Fruit trees, 373-379; low-growing, 379; manuring, 377; medium to large, 389; pests and diseases, 378; pruning, 375; site and soil for, 374; small, 381
 Fumigants, 109
 Fungus and fungus diseases, 110; sprays and washes, 111
Gaillardia, 221, 262
Gajar, 361
Gant gobi, 363
 Garden ornaments, 27-50
 Gardener's Calendar, 422-426
 Gardener's Garter, 178
Gardenia spp., 143
 Gardening books, 22; implements, 416-421
 Garlic, 372
 Gerbera, 221, 268
Ghiya taroi, 370
 Giant Cactus, 179
 Ginger, 372
 Gladiolus, 275
Gliricidia maculata, 119, 123
Globe amaranth, 262
Gloriosa superba, 167
 Golden Cup Poppy, 253
 Gold Fern, 209, 237
Goldfussia spp., 151
 Gold Mohur, 125, 236
 Gootce, 87
 Gourd, Bottle, 370; Club or Sponge, 370; Cylindrical sponge, 370; Snake, 370; White, 370
 Grafting, 88
 Granadilla, 386
 Grape Fruit, 382
 Grape Vine, 382
 Grass and Lawns, 182-194
 Grasses, ornamental, 176; small, 177; tall, 177, 237
 Green manures, 64-66, 355
Grevillea robusta, 128

[432]

INDEX

- Grubs, 106
Guaiacum officinale, 123
 Guava, 383, 397
Gul mohr, 125
Gulal tulsi, 367
 Gum trees, 132
 Gumbo, 371
Gymnogramme chrysophylla, 209, 237
Gynarium argenteum, 177
Gynura spp., 140, 223
Gypsophila, 24, 253
 Haemanthus, 274
Haematoxylon campechianum, 123, 198
 Halim, 362
Hamelia patens, 144, 197
Hamiltonia suaveolens, 151
 Hariali, 184
 Hatichuk, 359
 Heart's Ease, 256
 Hedge, round garden, 10
 Hedges, 195-200; barrier, 195; clipping, 199; demarcation, 196; planting, 198
Hedychium coronarium, 239
 Helichrysum, 260
Heliconia spp., 154
 Hemerocallis, 276
Hemigraphis colorata, 222
 Henna, 147
 Herbs, 367
Hibiscus spp., 144, 150, 154, 197, 237; *H. manihot*, 262; *H. mutabilis*, 24, 151
Hippeastrum, 237, 275
Holarrhena antidysenterica, 123
 Hollyhock, 253
Holmskioldia, 165
 Honeysuckle, 160
Huldi, 108, 372
 Hunnemanian, 253
 Hydroponics, 69
Impatiens sultani, 213
 Implements, garden, 416-421
 Inarching, 92
 Indian Coral Tree, 127
 Indian Cork Tree, 129
 Indian Corn, 370, 398
 Indian Ivy, 157
 Indian Plum, 384
 Indian Spinach Beet, 372
Inga dulce, 196
Inga saman, 130
 Insect pests, 102
 Insecticides, 104
Ipomoea spp., 166, 237; *I. biloba*, 241; *I. bona-nox*, 23; *I. horsfalliae*, 160; *I. palmata*, 159; *I. versicolor*, 167
Iresine spp., 213, 222, 223
Iris spp., 238, 276
Isfanaj, 365
Istufin, 364
 Ivory Tree, 123
Ixora spp., 145, 197, 200
 Jacaranda spp., 124
Jacquemontia violacea, 159
 Jambul, 389
 Japanese Day Lilies, 276
 Japanese Medlar, 390
Jasminum pubescens, 152, 154; *J. rex*, 160

[433]

INDEX

- Jatropha panduraefolia*, 146
 Java Fig, 129
 Jazur, 364
 Jhinga, 370
Jubaea spectabilis, 173
 Jungle trees, colourful, 126
- Kakri*, 369
Kalajam, 389
Karbuza, 379
Karela, 370
Kathamira, 367
Kela, 388
Kentia spp., 173, 175
 Kerosene emulsion, 107
Kheera sukasa, 369
Kleinhovia hospita, 124, 131
Kobi, 360
 Kohl-rabi, Knol-khol, 363
Kopsia fruticosa, 146, 154
Kuffa sag, 371
Kumquat, 384
Kumra, 366
Kurass, 362
- Ladies Fingers, 371
 Lady's Lace, 257
Lakut, 390
Lal kumra, 371
Lal mirich, 369
Lal sag, 371
Lantana, 23, 146, 154, 197, 222
Largerstroemia spp., 124, 131, 239; *L. indica*, 23, 146, 150, 154
 Larkspur, 253
Lason, 372
- Latania commersoni*, 173
Lauki, 370
 Lawns, 11, 182-194; drainage of, 182; 'Fairy rings' in, 190; fertilizers for, 186; games, 194; levelling, 183; pale or yellow, 185; planting, 183; top dressing for, 187; watering, 188; weeds in, 188; worm casts in, 189
Lawsonia alba, 147, 197
 Layers, 84
 Lead chromate sprays, 104, 105
 Leaf mould, 203
 Leek, 363
 Lemon, 384, 398
 Leptosiphon, 253; *L. hybridus*, 221
 Lettuce, 363
Lichu, 390
Licuala spp., 174, 175
 Lignum Vitae Tree, 123
 Lilies, 237; bulbs and tubers, 271-281
Lilium longiflorum, 274
 Lime, 69; lime-sulphur, 112; lime-water, 111
 Limes, 384, 398-399; Sweet, 384
Limnanthemum indicum, 240
 Linaria, 221, 254
 Linum, 254
 Litchi, 129, 390
 Lobelia, 250
Lobia, 369
 Logwood Tree, 123, 198
Lonicera odoratissima, 160
 Loquat, 390
 Love-in-a-mist, 255

INDEX

- Lovi-lovi*, 382, 399
 Lupin, annual, 254
Lygodium spp., 210
- Madonna Lily*, 274
 Madras Thorn, 196
 Madre Tree, 123
Magnolia spp., 147
 Maidenhair Fern, 209
 Maize, 370
Makai, 370
 Malabar Nightshade, 372
Malpighia coccifera, 147, 200
 Mamillaria, 180
Manettia bicolor, 163, 214
 Mango, 129, 390, 399
 Manures, bulk, 58; liquid, 60
Maranta spp., 213, 223
 Marcottage, 87
 Marigold, 23, 254, 262, 266
 Marliacea, 239
 Marshy ground, 235; plants for, 238
Marsillea quadrifolia, 239
 Marvel of Peru, 262
Matar, 364
Mathiola bicornis, 24, 254
Maurandya barclayana, 167
Mehndi, 147, 197
Melia azedarach, 124
 Melon, 379, 399; Water, 379
Memecylon tinctorium, 147, 154
 Michaelmas Daisy, 268
Michelia champaca, 125
 Mignonette, 255
Millingtonia hortensis, 129
Mina lobata, 167
- Mint, 367
Mirabilis jalapa, 262
Mirich, 361, 369
Mitha alu, 372
Mitha nimbu, 384
Monochoria hastaeifolia, 240
Montanoa bipinnatifida, 24, 152
 Moonflower, 23
 Moonlight garden, 16; plants for, 23
 Mosquitoes, 224
 Moss Verbena, 211, 264
 Mother of Cocoa, 123
 Mulberry, Indian, 384
 Mulching, 56
 Muli, 365
 Munzerabad Creeper, 161
Murraya exotica, 197, 200
Musa coccinea, 154
 Mushrooms, 368
Mussaenda spp., 147, 154
 Mussel-shell Creeper, 166
 Mustard, garden, 363
- Naphthalene emulsion, 105
Narungi, 385
 Naseberry, 388
Naspati, 391
 Nasturtium, 221, 255
 Neem, 108, 129
Nelumbium speciosum, 239
 Nemophila, 255
 Nepal Trumpet Creeper, 162
Nephrolepis spp., 210, 237
 Nerium, 148
 Nicotiana, 23, 263
 Nigella, 255
 Night Scented Stock, 24, 254

INDEX

- Nimbu*, 384
Nipa fruticans, 175, 238
 Nipple cactus, 180
Nolana grandiflora, 221, 256
Nopalea, 221; *N. coccinellifera*, 179
 Nursery beds, 76
Nymphaea spp., 229, 239

Ochna squarrosa, 148
Ochrosia borbonica, 241
Odontadenia speciosa, 162
 Okra, 371
Olea fragrans, 24, 153
 Oleander, 148, 154, 237
 Onion, 363, 400
Onychium japonicum, 210
Ophiopogon intermedius, 200
Opuntia spp., 179, 221
 Orange, 385, 400-401
 Orchids, 343-350; a selection, 349; epiphytic, 346, 349; how they grow, 344; propagation, 345; terrestrial, 348, 350; watering, 349
Oreodoxa spp., 173
 Ornamental vases and tubs, 39
 Ornaments, garden, 27-50
Orthosiphon stamineus, 148, 154, 222
Ottelia alismoides, 240

 Padauk, 125
 Palak sag, 365
 Palang sag, 372
 Palas, 127
 Palms, 172; pot, 174, 215; tall, 173

Palwal, 371
 Pampas Grass, 177
Panax spp., 140
Pancratium longifolium, 237, 276
Pandanus spp., 175, 238, 241
Panee kumra, 370
Panicum variegatum, 210, 222
 Pansy, 256
 Papaw, 385
 Papaya, 385
 Papeeta, 385
 Paragus, 359
Parkinsonia aculeata, 196
Parmentiera cerifera, 131
 Parsley, 364
 Parsnip, 364
Passiflora spp., 159
 Passion Flower, 159
 Passion Fruit, 386, 401
 Paths, paved, brick and concrete, 27-34; small plants on, 29
Patwa, 380
 Peach, 387, 401-402
 Peacock Flower, 142
 Peacock's Tail Tree, 125
 Pear, 388
 Peas, 364
 Peepul, 130
Pellionia spp., 210, 222
Peltophorum ferrugineum, 125, 131, 236
Pentas spp., 153, 214, 222
Peperomia spp., 213, 223
 Pergolas, 44
Pergularia odoratissima, 24, 163
 Persian Lilac, 124
 Pests and diseases, 99-113

[436]

INDEX

- Pests, animal, 101; insect, 102
Petrea volubilis, 165
Petunia, 23, 29, 221, 256, 263, 268
 Phacelia, 256
Phaius spp., 350
Phalaris arundinacea, 178, 200
Philodendron carderi, 157, 214, 222
Phlox drummondii, 221, 247, 256; *P. nana compacta*, 221
Phoenix roebelinii, 175; *P. rupicola*, 174
Phul kobi, 361
Phyllocactus spp., 180
Pilea muscosa, 200, 222
Pimpinella monoica, 257
Pinanga spectabilis, 174
 Pineapple, 380, 402
 Pink Cassias, 121
Pistia stratiotes, 240
Pitcairnia, 221; *P. alta*, 154, 179
Pithecolobium dulce, 196; *P. saman*, 130, 131
Piyaj, 363
 Planorbis, 225
 Plantain, 388
 Plant food, 56
 Plant propagation, 72-94
Platystemon californicus, 221, 257
Plumbago spp., 148, 152; *P. capensis*, 198
Plumeria spp., 148, 154, 237
Poinciana pulcherrima, 142; *P. regia*, 125, 236, 238
Poinsettia pulcherrima, 152
 Poi sag, 372
Poirrea coccinea, 159

 Polianthes, 275
Polyalthia longifolia, 129, 131
Polypodium spp., 210
 Pomegranate, 389
 Pomelo, 388, 403
 Pools, paved, 39, 232
 Poppy, 257
Porana spp., 24, 166
 Portia Tree, 126
 Portulaca, 29, 221, 263
 Potato Creeper, 23, 160
 Potatoes, 364
 Potato Tree, 126
Pothos spp., 157
 Pot plants, 201-215; for ferneries, 211
 Potting annuals, 265; palms, 174
 Prickly Pear, 179
 Pride of India, 124
 Propagation, by cuttings, 80; by division of rootstock, 84; by 'eyes' and leaves, 83; by grafting, 88; by layers, 84; by seed, 72
 Pruning, 95-98; types of, 98
Pteris spp., 210
Pterocarpus indica, 125
Ptychosperma macarthuri, 174, 175
Pudeena, 367
 Pumelo, 388
 Pumpkin, Red, 371, 403
 Pyara, 383

 Quassia amara, 149
 Quassia water, 101
 Queen's Flower, 124
 Queen of the Night, 23, 142
Quisqualis indica, 163, 237

[437]

INDEX

Radish, 365
 Rai, 363
 Railway Creeper, 159
 Rain Tree, 130
 Rangoon Creeper, 163
 Ratalu, 372
Ravenala madagascariensis, 131
 Recipes, 395-404
 Red Sorrel, 380
 Red-topped Grass, 178
Rhapis flabelliformis, 174, 175, 238
 Rhodanthe, 260
Rhoeo discolor, 223
Rhyncospermum jasminoides, 23, 159, 163
Rhyncostylis retusa, 350
 Ribbon Grass, 178, 200
Ricinus spp., 140
 Rockeries, 216-223; making, 216; types of, 219
 Rockery plants, 221-223; care of, 220
 Rose (s), 282-313; Austrian Briar, 285; Banksian, 288; Bourbon, 286, 309; China, 285; classification of, 283; climbing, 288, 312; Damask, 283; Damask Perpetual, 284; disbudding, 295; French, 283; garden, 304; hedges, 306; Hybrid Bourbon, 284; Hybrid Perpetual, 286, 309; Hybrid Tea, 287, 310; imported, 293; Japanese, 286; Moss, 284; Musk, 286; on the plains, 289; pegging down, 305; Pernetiana, 287; pests and diseases, 302; planting, 291; Polyantha, 288, 312; pot planting, 308; propagation, 298; pruning, 295; Provence, 283; Rambler, 289; short selection of, 309; soils and manures for, 290; standard, 305; Sweet Briar, 285; Tea, 285, 310; watering, 295; wintering of, 294
Roupellia grata, 165
 Rozelle, 380, 403
 Rudbeckia, annual, 257
 Rushes, 238
Russelia spp., 149
 Rusty Shield-bearer, 125

Sabal adansonii, 174
Saccharum arundinaceum, 177
 Saddle grafting, 89
 Sage, 368
Sagittaria sagittifolia, 240
Saintpaulia ionantha, 213
 Sakurkund, 372
 Salad, 363
 Salix, 238, 239; *S. babylonica*, 128
 Salpiglossis, 257
Salvia spp., 222, 257, 269
 Sand-binding plants, 241
 Sandwich Island Creeper, 159
Sansevieria spp., 223
 Sapodilla, 391
Saponaria vaccaria, 258
 Sapota, 391
Saraca indica, 125
 Sareefa, 381
 Saunf, 367

INDEX

Scarlet Cordia, 122
 Schizmatoglottis, 223
Seaforthia elegans, 173
 Sea Lavender, 260
 Seashore, plants for, 241
 Seaside garden, 236
Sedum sarmentosum, 29
 Seed, boxes, 77; collecting and storing, 73; germination, 73; propagation by, 72; sowing, 74, 248; testing, 74; vegetable, 356
 Seedlings, care of, 78; 'damping off', 79; transplanting, 79; watering, 79
 Seesti, 368
Selaginella spp., 222
 Sem, 360, 369
 Senna, 125
 Shaddock, 388
 Shade, climbers for, 163; fernery plants for, 209; rockery plants for, 221; shrubs for, 152
Shaleri, 362
 Shalgam, 366
 Shaloot, 384
 Shirley Poppy, 257
 Shisham, 130
 Shrubs and shrubberies, 11, 133-154
 Shrubs, doctoring old, 137; flowering, 140; foliage, 138; planting, 133; pruning, 138
 Silk Cotton Tree, 127
 Silver Fern, 209
Simul, 127
 Snails, aquatic, 225
 Snapdragon, 250
 Soap emulsions, 107
 Soil and manuring, 53-71
 —, deficiencies, 57; management, 54
 —, poor, shrubs for, 153
 —, sandy, plants for, 241; treatment of, 55
Solanum spp., 23, 160; *S. macranthum*, 126
 Soldier's Butter, 389
 Sowa, 367
 Spanish Bayonet, 179
Spathodea spp., 126, 236
Spathoglottis spp., 350; *S. plicata*, 222, 348, 350
 Spinach, 365; country varieties, 371; New Zealand, 365
 Spineless Cactus, 179
 Squash, 366
 Stable manure, 59
Stapelia gigantea, 180
 Starfish Flower, 180
 Star Fruit Creeper, 161
 Star of the Veldt, 268
Statice, 260
Stephanotis floribunda, 23, 161
Sterculia colorata, 127
Stevensonia grandifolia, 174
Stipa pennata, 178
 Stocks, 258
 Stomach poison bait, 105
 Strawberry, 380
Strobilanthes spp., 140, 149, 213
 Succulents, 178; pot, 180; tall, 179
 Summer houses, 49
 Sundials, 36
 Sunflower, 23, 258, 263
 Swan River Daisy, 251
 Sweet Alison, 250

INDEX

Sweet Majoram, 367
 Sweet Pea, 258
 Sweet Potato, 372
 Sweet Wivelsfield, 260
 Tamarind, 130
 Tamarindus indica, 130
 Tamarix, 241
 Tanks, formal, treatment of, 227; plants for, 237
 Tarbuz, 379
 Tassel Flower, 261
 Tecoma spp., climbers, 161; shrubs, 23, 149, 154
 Tecomella undulata, 126
 Temple Tree, 148
 Tennis court, grass, 190
 Tephrosia purpurea, 241
 Ternera elegans, 241, 269; T. ulmifolia, 241
 Terraces, 42
 Thespesia populnea, 126, 131, 241
 Thevetia neriiifolia, 150, 154, 198
 Thrinax argentea, 174
 Thunbergia alata, 159; T. fragrans, 23, 163, 214; T. grandiflora, 163; T. mysorensis, 161; shrubs, 150
 Thunia alba, 350
 Thyme, 368
 Thysanolaena agrostis, 177
 Tipparee, 379; jam, 397
 Tithonia diversifolia, 152, 154; T. speciosa, 260, 263
 Tobacco, flowering, 23, 263
 Tobacco water, 108
 Tomato, 365, 403-404
 Toot, 384
 Torenia spp., 263
 Tradescantia discolor, 223; T. zebrina, 211, 222
 Transvaal Daisy, 260
 Trapa bispinosa, 240
 Traveller's Tree, 131
 Trees, 117-132; care of, 129; colourful jungle, 126; flowering, 120-126; large dense, 128; large light, 129; ornamental foliage, 128; planting, 117; unusual, 131; very big, 130; waste land for, 132
 Tree Mignonette, 147
 Tricholaena rosea, 178
 Tristellateia australis, 161
 Trumpet Flower, 153
 Tuberose, 275
 Tubers, lily bulbs and, 271-281
 Turmeric, 108, 372
 Turnip, 366
 Typha spp., 238
 Unjeer, 381
 Urania speciosa, 131
 Ursinia anethoides, 264
 Utricularia, 240
 Vallisneria spiralis, 240
 Vanda spp., 349
 Vegetable garden, 12, 354
 Vegetable Marrow, 366, 404
 Vegetables, 353-372; blanching, 358; cold season, 358; country, 369; planting, 357; seeds, 356; staking, 357

INDEX

Verbena, 221, 260; V. erinoides, 29, 212, 221, 264
 Victoria regia, 239
 Vilaiti baigan, 365
 Vilaiti kaddu, 366
 Vilaiti kasni, 362
 Vilaiti piyaj, 363
 Vinca rosea, 241, 264; V. minor, 84
 Violet, 270
 Vitis discolor, 157
 Water Gardens and Marshy Ground, 224-241
 Water fleas, 226
 Watering, 20
 Water lilies, 229, 239
 Water weeds, 239
 Weeds on lawns, 188
 Weeping willow, 128, 238
 West Indian Mountain Rose, 120
 Whip grafting, 89
 Wind breaks, 198
 Woodfordia floribunda, 150
 Worm casts, 189
 Yellow Cassias, 122
 Yellow Gold Mohur, 125
 Yellow Silk Cotton Tree, 122
 Yucca, 221; Y. gloriosa, 179
 Zephyranthes lilies, 222, 237, 276
 Zinnia, 264; Z. linearis, 221, 264



81
 NH3