

FRUIT
AND ITS
CULTIVATION

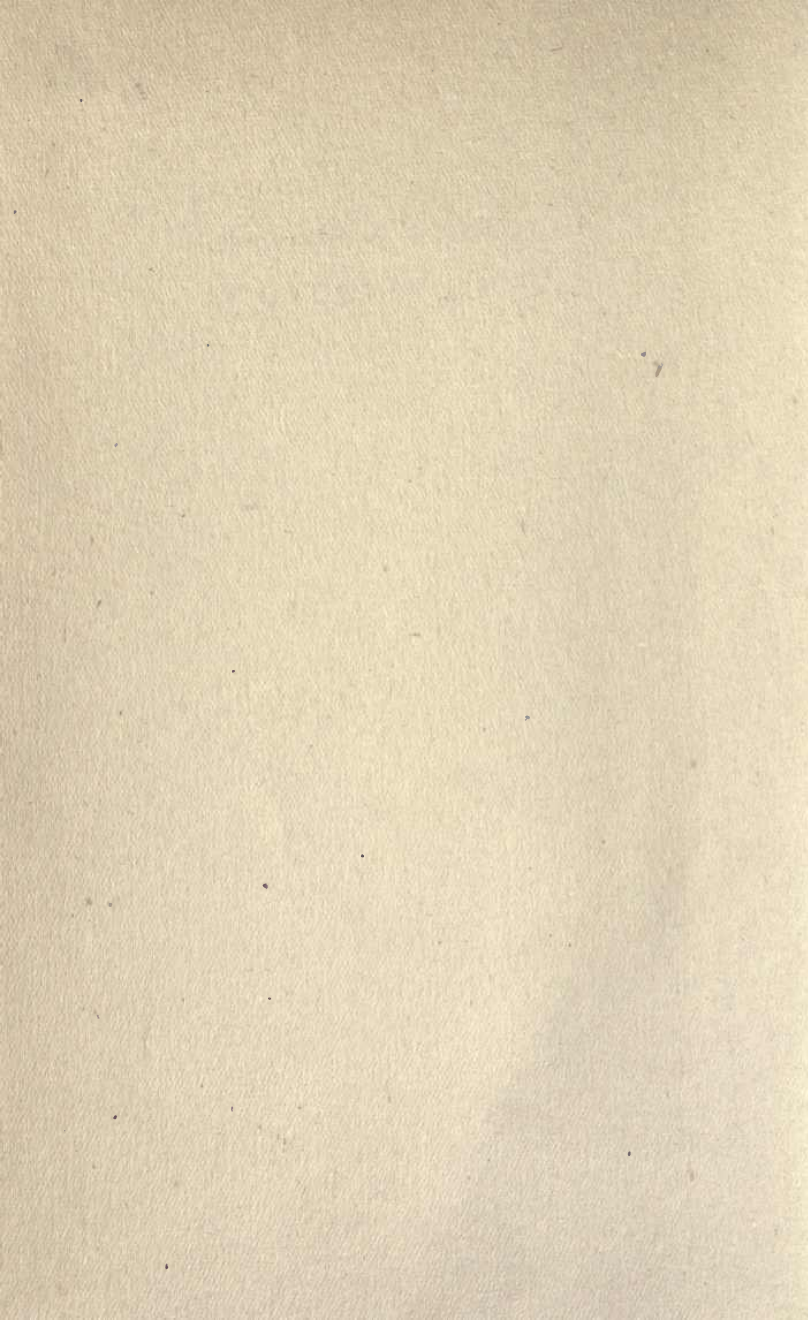


T. W. SANDERS. F.L.S.



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COLLINGRIDGE

FRUIT AND ITS
CULTIVATION





FULL OF PROMISE.
A Bush Apple Tree in Blossom.

FRUIT

AND ITS

CULTIVATION.

THE CULTIVATION OF ALL KINDS OF HARDY FRUITS IN GARDEN AND ORCHARD, INCLUDING PLANTING, PRUNING, TRAINING AND PROPAGATION, SELECTIONS OF VARIETIES, AND DESCRIPTIONS OF INSECT AND FUNGOID PESTS, WITH REMEDIES FOR THEIR ERADICATION.

BY

Thomas
T. W. SANDERS, F.L.S., F.R.H.S.

(Knight of First Class of the Royal Order of Vasa, Sweden).

Editor of "Amateur Gardening"; Author of "Allotment and Kitchen Gardens," "Amateur's Greenhouse," "Vegetables and their Cultivation," "The Flower Garden," Etc.

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FOREWORDS.

THE cultivation of hardy fruits in gardens, orchards, and plantations is a fascinating, and, in favourable seasons, a profitable pursuit. During the last century it engaged the attention of many distinguished men, such as the late Thomas Andrew Knight and Dr. Hogg among amateurs, and Mr. Thomas Rivers and others among trade growers, to whom we owe many of the most popular varieties of fruit grown at the present day. To them also we owe the introduction of the dwarfing stocks by means of which apples and pears especially can be grown as cordons or bushes in a more limited space than was possible in former times. Hence we find dwarf fruit trees now being grown extensively and profitably in small gardens, as well as in large plantations, these coming into bearing at a much earlier period of their life than the erstwhile standard-trained trees of generations ago.

There are few small gardens indeed in which it is not possible to grow luscious and useful fruits successfully. The Blackberry and the Loganberry, for example, may be easily and profitably grown on fences, walls, or on arches; horizontally-trained cordon apples and pears may form a pleasing fringe to the garden paths; vertical and obliquely-trained cordon plums, cherries, apples, pears, gooseberry, and currant trees clothe an archway or pergola, or cover a low wall or fence profitably; bush-trained apples, pears, plums, cherries, gooseberries, and currants grown around the margins of paths or in small plots; in each case, if intelligently cared for, producing an annual crop of delicious fruits. In far too many instances owners of small gardens have failed to obtain satisfactory crops of fruit

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FOREWORDS.

through planting such unsuitably trained trees as espaliers against low walls or fences, or standards where the space available for the natural extension of roots and branches has been too circumscribed. Severe pruning has consequently had to be resorted to, with the inevitable result, rank growth and no fruit. Had such low walls or fences been planted with cordons, or the open garden with bush-trained trees, the result would have proved more successful.

The cultivation of hardy fruits is likely to be carried on in a more extensive manner in the near future. It has been realised, as the result of the late European War, that we must cultivate food crops more largely than ever, so as to endeavour to make this sea-girt island more independent of imported food supplies in the future than in the past; and next to vegetables, hardy fruits, such as the apple, plum, etc., form an important and essential part of our daily dietary.

Thousands of men who are in process of being demobilised from the Army and Navy are apparently keen upon settling down on the land, and hence, we shall see in due course a great extension of small holdings, and the more general cultivation of fruit and vegetables throughout the kingdom. May it be so. Such men will need guidance and counsel in the carrying out of so laudable and patriotic an enterprise, if they desire to obtain the most successful results, and we think we can modestly say that they could not obtain the information needed from a better, more reliable, or more practical source than the pages of this volume.

The old axiom saith: "Good wine needs no bush." Thus we need do no more than state that the present edition, which has been carefully brought up to date, will speak for itself. In its pages the fruit grower will find sound, practical guidance on the cultivation of hardy fruits in all its various phases.

CONTENTS.

PART I.—HARDY FRUITS.

		PAGE
Chap.	I. THE APPLE—History—Soils—Propagation—Planting—Pruning — Modes of Training — Storing Fruit — Varieties, Etc.	9
„	II. THE APRICOT—History—Propagation—Soil—Planting —Pruning—Summer and Winter Pruning—Varieties, Etc.	39
„	III. THE BARBERRY—Culture and Varieties... ..	47
„	IV. THE BILBERRY—Propagation and Culture	48
„	V. THE BLACKBERRY—History—Culture—Pruning—Feed- ing and Propagation, Etc.... ..	49
„	VI. THE BULLACE AND DAMSON—History—Propagation— Soil—Planting—Pruning—Varieties, Etc.	51
„	VII. THE CHERRY — History — Soil — Planting — Modes of Bearing—Pruning—Varieties, Etc.	56
„	VIII. COBNUTS AND FILBERTS—History—Mode of Bearing— Propagation—Planting—Pruning—Varieties, Etc.	67
„	IX. THE CRAB—Culture and Varieties	75
„	X. THE CRANBERRY—Culture and Varieties	77
„	XI. THE CURRANT — History — Propagation — Methods of Culture—Planting—Pruning—Varieties, Etc.	78
„	XII. THE FIG—History—Mode of Bearing—Propagation— Soil—Planting—Pruning—Varieties, Etc.	88
„	XIII. THE GOOSEBERRY — History — Propagation — Soil and Situation—Planting—Pruning—Varieties, Etc.	94
„	XIV. THE GRAPE VINE—History—Propagation—Soil—Plant- ing—Pruning—Training—Varieties, Etc.	107
„	XV. THE LOGANBERRY, LAXTONBERRY AND LOWBERRY— Culture and Propagation, Etc.	114
„	XVI. THE MEDLAR—History—Propagation—Mode of Train- ing—Planting—Varieties, Etc.	118

CONTENTS.

	PAGE.
Chap. XVII. THE MULBERRY—History—Propagation—Soil— Planting—Pruning, Etc.	121
„ XVIII. THE PEACH AND NECTARINE—History—Propagation— Modes of Training—Soil—Planting—Pruning— Disbudding—Varieties, Etc.	125
„ XIX. THE PEAR—History—Propagation—Soil—Modes of Training—Planting—Pruning—Storing Fruit— Varieties, Etc.	136
„ XX. THE PLUM—History—Propagation—Soil—Modes of Training—Planting—Pruning—Storing Fruit— Varieties, Etc.	158
„ XXI. THE QUINCE—History—Propagation—Culture—Prun- ing—Varieties, Etc.... ..	175
„ XXII. THE RASPBERRY—History—Propagation—Soil and Situation—Methods of Culture—Planting—Pruning— Varieties, Etc.	178
„ XXIII. THE STRAWBERRY—History—Propagation—Soil and Position—Planting—Varieties, Etc.	187
„ XXIV. STRAWBERRY-RASPBERRY—History and Culture ...	196
„ XXV. THE WALNUT—History—Propagation—Soil, Situation— Planting—Pruning—Varieties—Storing the Nuts, Etc.	197
„ XXVI. THE WINEBERRY—History—Propagation—Culture, Etc.	201

PART II.—PRACTICAL WORK.

Chap. I. PROPAGATION OF FRUIT TREES—By Seeds—Budding— Grafting—Cuttings—Layering and Suckers	202
„ II. PLANTING—Choosing the Site—Shelter—Sites for Planting—Drainage—Depth for Planting—Staking, Etc.	217
„ III. PRUNING—Principles and Object of Pruning—Summer and Winter Pruning—Disbudding—Root Pruning, Etc.	226
„ IV. TRAINING FRUIT TREES—Cordons—Pyramids—Bushes —Espaliers—Fan-trained and Standards	242
„ V. MANURING GARDEN TREES—Mistakes in Manuring— Main Elements of Plant Food—How to Apply Manures —Special Manures for various Fruits, Etc.	252

CONTENTS.

	PAGE.
Chap. VI. STORAGE OF FRUIT—When to Gather Fruit—The Fruit Store—General Hints, Etc.	260
„ VII. FRUIT ENEMIES — Description of, with Up-to-date Remedies	268
„ VIII. FRUIT DISEASES — Description of, with Remedies for their Eradication	295
„ IX. CAUSES OF UNFRUITFULNESS—Sterility of Blossoms—Frost—Faulty Pruning—Damage by Pests—Conclusions	301
„ X. PROTECTING FRUIT BLOSSOMS—Glass Copings—Canvas Blinds—Fish Netting—Orchard Trees, Etc.	305

PART III.—MARKET CULTURE.

Chap. I. ORCHARDS — Site — Shelter — Soil — Arrangement of Mixed Orchards—Planting—Pruning—General Culture	308
„ II. FRUIT PLANTATION—Aspect—Shelter—Soil—Planting—Distances—Examples of Plantations, Etc.	323
„ III. PACKING FRUIT FOR MARKET—Grading—Packages—Methods of Packing	329
„ IV. SPRAYING FRUIT TREES—Winter and Summer Spraying—General Hints on Spraying, Etc.	337
TABLES FOR FRUIT GROWERS	346
INDEX	357



LIST OF PLATES.

APPLE :

ALLINGTON PIPPIN	...	...	... <i>facing page</i>	32
BEAUTY OF BATH	...	...	.. "	33
BLENHEIM ORANGE	...	...	.. "	41
CHARLES ROSS	...	...	.. "	32
COX'S ORANGE PIPPIN	...	...	.. "	40
FRUITS ATTACKED BY THE SCAB				
DISEASE	...	...	.. "	288
KING'S ACRE BOUNTIFUL	...	...	.. "	240
MRS. PHILLIMORE	...	...	.. "	305
NEWTON WONDER	...	...	.. "	25
PEASGOOD'S NONSUCH	...	...	.. "	48
WORCESTER PEARMAIN	...	...	.. "	33

APPLE TREE :

BUSH, FULL OF PROMISE	...	...	.. <i>Frontispiece</i>	
FAN TRAINED, A (COX'S ORANGE PIPPIN)	...	...	... <i>facing page</i>	17
FRUITFUL BUSH	...	...	.. "	24
GRIDIRON TRAINED, A	...	...	.. "	16
THREE-YEAR-OLD BUSH TRAINED	...	...	.. "	224

CHERRY :

BIGARREAU	...	...	.. "	64
GOVERNOR WOOD	...	...	.. "	56
MORELLO	...	...	.. "	57

CRAB :

JOHN DOWNIE "	73
-------------	-----	-----	------	----

CURRANT :

WHITE DUTCH, THE "	80
------------------	-----	-----	------	----

DAMSON :

FARLEIGH PROLIFIC OR CLUSTER "	49
------------------------------	-----	-----	------	----

LIST OF PLATES.

FILBERT: THE RED	...	...	...	...facing page	72
GOOSEBERRY:					
GOLDEN BALL	...	...	...	..	105
LANGLEY BEAUTY	...	...	...	..	97
LEADER, THE	...	...	...	..	96
STOCKWELL, THE	...	...	...	..	81
WILMOT'S EARLY RED	...	...	...	..	104
GRAPE:					
BEFORE AND AFTER THINNING	...	...	...	..	113
BLACK HAMBURGH	...	...	...	..	112
LOGANBERRY:	...	...	...	..	120
LOWBERRY:	...	...	...	..	121
NECTARINE:					
VIOLETTE HÂTIVE	...	...	...	..	136
PEACH:					
HALE'S EARLY	...	...	...	..	128
SEA EAGLE	...	...	...	..	137
TREE, A WELL-CROPPED	...	...	...	..	129
PEAR:					
BEURRÉ ALEXANDRE LUCAS	...	...	...	..	273
BEURRÉ CLAIRGEAU	...	...	...	..	272
BEURRÉ HARDY	...	...	...	..	352
BEURRÉ RANCE	...	...	...	..	321
BEURRÉ SUPERFIN	...	...	...	..	145
CONFERENCE	...	...	...	..	289
DOYENNÉ DU COMICE	...	...	...	..	208
DURONDEAU	...	...	...	..	65
FERTILITY	...	...	...	..	153
GENERAL TODLEBEN	...	...	...	..	336
KNIGHT'S MONARCH	...	...	...	..	320
MARGUERITE MARILLAT	...	...	...	..	144
MARIE LOUISE	...	...	...	..	337
NOUVELLE FULVIE	...	...	...	..	209
TRIOMPHE DE VIENNE	...	...	...	..	152

LIST OF PLATES.

PEAR TREES:

CORDON TRAINED *facing page* 225

PLUM:

AUTUMN COMPÔTE ,, 161
 COE'S GOLDEN DROP ,, 169
 COX'S EMPEROR ,, 176
 GRAND DUKE ,, 353
 OULLIN'S GOLDEN GAGE ,, 168
 POND'S SEEDLING ,, 257
 PRINCE ENGLEBERT ,, 256
 VICTORIA ,, 160

QUINCE: ,, 177

RASPBERRY:

CARTER'S PROLIFIC ,, 184
 DEVON, THE ,, 304
 OCTOBER RED ,, 241

STRAWBERRY:

AUGUSTE NICAISE ,, 192
 ELEANOR ,, 193
 ROYAL SOVEREIGN ,, 185
 WATERLOO ,, 200

WALNUT: ,, 201

ILLUSTRATIONS IN THE TEXT.

	PAGE		PAGE
APPLE BRANCH, furnished		Currant Tree, Mode of Train-	
with Fruit Spurs	230	ing a Standard ...	83
,, Shoots, Types of ...	25	,, A Four-year-old ...	82
,, Tree, A Four-year-		,, A Three-year-old	80
old	12	,, Trees, Standard ...	85
,, A Maiden	10	,, Winter - pruning a	
,, A Standard	24	Black	233
,, An Espalier	17		
,, An Established ...	15	DAMSON SHOOTS, Types of ...	32
,, Before Pruning ...	244		
,, Side Branch of an	229	FILBERT, Flowering Branch	
,, Three-year-old ...	11	of	68
,, Two-year-old ...	10	Fruit Protector for Walls...	306
,, Trees, Horizontal		,, Room, a Lean-to ...	263
Cordons	19	,, A Span-roof	265
,, Oblique Cordons...	23	,, Store, A Handy ...	262
,, Summer-pruning	227	,, Trees, A Lesson in	
,, Vertical Cordons...	21	Pruning	224
Apricot Shoots, Types of ...	43		
		GRAFTING, Cleft	212
BLACK CURRANT, Modes of		,, Crown or Rind	211
Training	246, 247, 248	,, Old Trees	213
Brown Currant Scale	282	,, Result of	214
		,, Saddle	212
CHEERRY TREE after Pruning	63	,, Side	214, 215
,, Before Pruning	62	,, Whip or Tongue ...	211
Cherries, Summer-pruning		Goat Moth and Larva	273
Morello	60	Gooseberry Cuttings	95
,, Summer-pruning		,, Properly Pruned ...	233
Sweet	59	,, Tree, A Maiden ...	96
Cobnut Bush, A Kentish ...	71	,, An Established ...	101
,, Fruiting Branch of	70	,, A Three-year-old	99
Codling Moth and Grub ...	269	,, A Two-year-old ...	97
Currant, A Two-year-old...	79	,, Four - stemmed	
,, Clearwing Moth and		Cordon	105
Larva	278	,, Ill-grown	96
,, Cutting of a Red ...	79	,, Trees, Cordon	103
,, Fruiting Branch of			
Red	231	LABEL, The "Acme"	223
,, Sawfly and Larvæ...	281	Lackey Moth and Larva ...	272
,, Winter - pruning a			
Red	231	ORCHARDS, Modes of Plant-	
,, Tree, a Maiden	79	ing	312, 313, 314
,, An Established ...	82		

ILLUSTRATIONS IN THE TEXT.

	PAGE		PAGE
Orchard Trees, Pruning, 316, 317, 318, 319, 320, 321	321	Plums, Thinned	169
		„ Unthinned	168
PEACH FRUITS, Thinning...	132	Pruner, Barrow's Patent...	235
„ Shoot with Fruit		RASPBERRY, A Badly-grown	
„ Buds	132	Plant	161
„ Shoot, Winter-		„ A Year-old Plant...	179
„ pruning	147	„ Beetle, The	291
„ Shoots, Types of	144	„ Right Method of	
„ Shoots, Stopping ...	129	„ Pruning	181
„ Training	130	Raspberries, Maiden Plants	179
„ Tree, A Fan-trained	127	„ Pruning Trained ..	183
Pear Tree, A Bush-trained	137	„ Wrong Mode of	
„ A Maiden	137	„ Pruning	181
„ A Palmette Verrier-		Root Pruning, Right Way ..	238
„ trained	140	„ Wrong Way	237
„ A Pyramid	138	Roots, Pruning	240
„ after Pruning	145	SCIONS FOR GRAFTING	209
„ An Espalier	142	Shears, Pruning	235
„ before Pruning ...	145	Shoots, A Lesson in Pruning	234
„ Summer-pruning ...	144	Social Pear Sawfly	286
Plantations, Modes of Plant-		Strawberries, Layering ...	182
„ ing	327	„ Planting	191
Planting, Right Way of ...	220	TOOLS, Pruning	236
„ Wrong Way of ...	220	Tree, a Properly Staked ...	222
Plum Shoot, A Worthless ...	162	„ Preserving a Newly-	
„ Shoots, Types of ...	161	„ planted	224
„ Winter Pruning...	164	„ A Badly-staked ..	221
„ Summer-pruning ...	163	VINE LATERAL, A	112
„ Tree, A Fan-trained	249		
„ after Pruning ...	165		
„ before Pruning ...	165		

COMPANION WORKS

TO THIS VOLUME,

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FRUIT and its CULTIVATION.

Part I.—HARDY FRUITS.

CHAPTER I.

The Apple.

THE Apple is one of the oldest, most highly esteemed, and most valuable of our hardy fruits. It has been cultivated from time immemorial. The ancient Greeks and Romans were well acquainted with it, and grew many varieties. It is said that we owe its introduction to this country to the Romans, but there are strong reasons for believing that it was cultivated here prior to the Roman Conquest. It is true the Romans may have introduced some of their favourite kinds, but there is little doubt that the ancient Britons cherished the apple both for food and beverage purposes. In proof of this we have the fact of the Romans, when visiting Somerset, discovering a town bearing the name of Avallonia, which existed on the site of Glastonbury. The meaning of this ancient British word is "apple orchard," and hence it is assumed that orchards of apples existed in the district. We further learn that when the Britons retreated before their conquerors to Wales, and thence to Brittany, they esteemed their apple trees so highly that they carried them with them.

Cider, the well-known beverage made from apples, is reputed to have been first introduced into Britain by the Phœnicians, who traded in tin with the Cornish folk. The name is derived from the Anglo-Saxon "sieder." Apples would, no doubt, be largely grown for producing this beverage, and hence came the planting of orchards in Devon, Somerset, Gloucester, Hereford, and Worcester



Fig. 1.

A "MAIDEN" APPLE TREE.

First year's growth after grafting.
A, where to prune in winter.

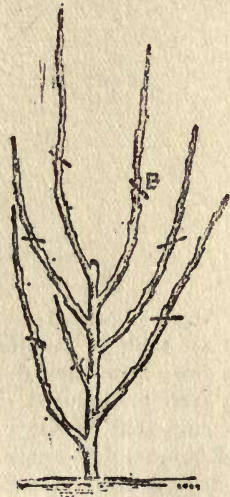


Fig. 2.

A TWO-YEAR-OLD APPLE TREE.

Result of pruning Fig. 1. The bars (B) show where to prune in winter.

on a large scale. Then, when monasteries were established, the monks, being keen gardeners, would naturally grow apples and other hardy fruits, including the vine, extensively.

One of the oldest varieties grown in this country was the Costard. It is the first to be mentioned in ancient records, and appears to have been largely grown for sale in the thirteenth century. The modern name of "costermonger,"

applied to hawkers of fruit and vegetables, is derived from this apple. In earlier times the person who sold apples

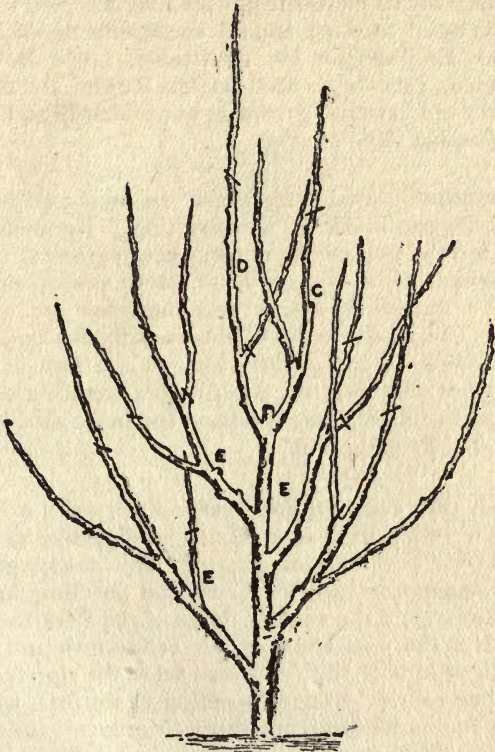


Fig. 3. THREE-YEAR-OLD APPLE TREE.

The shoots C and D are the new growths developed from the preceding year's shortened wood (B Fig. 2). E E are fruit buds. Bars indicate where to prune.

was known as a "costard-monger." Chaucer refers to this apple in the following line:

"Your chekes embolmed like a mellow costard."

The Pearmain variety is referred to as early as 1200. The Golden Pippin, a famous apple in the reign of King Henry VIII., was raised in Sussex. This was held in such high esteem for its exquisite flavour that it is said Catherine of Russia used to have annual consignments of its fruit sent from England for her own table. The Devonshire Quarrenden, Juneating, and Golden Russet are examples of the very old varieties grown in our orchards and gardens at the present day.

Propagation.—Apples trees may be increased by seeds, cuttings, layers, budding, and grafting. By seeds is only advised for the purpose of rearing new varieties. By cuttings, again, is a slow process, and serves no useful purpose. Layering is not recommended for a similar reason. The usual methods practised in this country are shield budding in July or August and grafting in March. Budding and whip grafting are suitable methods for young stocks, and rind or crown grafting for large stocks. (See article on “Propagation.”)

Stocks.—For budding and grafting purposes it is essential to have young trees reared from seed or layers, to serve as stocks for the buds or grafts. The stocks generally used for apple trees are the Crab, the Seedling Apple, or “Free” stock, and the various forms of the Paradise Apple. The Crab is the wild apple of our hedgerows and woods, and seeds or pips of this, collected from the ripe fruit, and sown in due course, produce Seedling Crab trees, which are available for budding or grafting. Moreover, the Crab is the hardiest of all stocks, and hence is specially adapted for exposed positions, orchard culture, and the poorer and lighter classes of soil.

The Seedling Apple is any kind of cider or Codling Apple reared from seed. Such stocks naturally vary much in habit, and hence do not produce trees so uniform in growth as the Crab. Apples worked upon such stocks grow away freely, and are better suited for culture in rich soils than

the Crab. The roots of the Crab and the Seedling Apple are strong and deep-rooting; hence they are not suited for small trained trees, but only for standards, half-

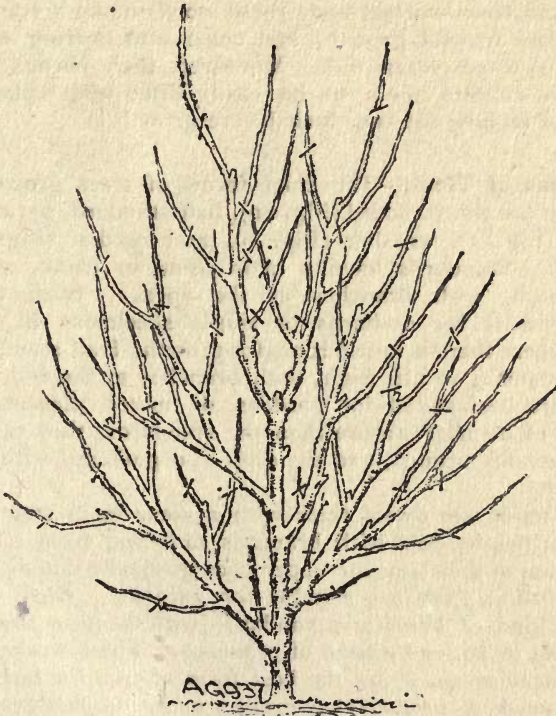


Fig. 4. FOUR-YEAR-OLD APPLE TREE.

Bars show the amount of pruning each shoot requires in winter.

standards, pyramids, and espaliers, that do not require to be restricted in growth.

For bush trees and cordons the most serviceable stock is the Paradise. In England the Broad-leaved and the Nonsuch Paradise stocks are chiefly used. These were

originally obtained from seedling forms of the Paradise apple, and subsequently by means of layers. The latter are distinguished from the Crab and Free stocks by their mass of fibrous roots and their dwarfer growth. Cordon and bush trees worked upon these stocks make a sturdier and more fruitful growth, and come into bearing when two to three years old. Moreover, their fibrous root growth enables them to be easily lifted and replanted without unduly affecting their future growth.

Forms of Trees.—The chief forms of trees grown in Britain are the standard (Fig. 10), half-standard, pyramid, bush (Fig. 5), espalier (Fig. 6), and cordon (Figs. 7 and 8). Standards have a main stem, or trunk, about 6ft. high, with branches at the apex. Such trees are suitable for orchards or single specimens in gardens where there is ample room for growth. Half-standards have stems 3 to 4ft. high, with branches at the top, and they are best suited for gardens or mixed plantations. Being of dwarfer stature than the standards, they can be more readily pruned, and the crop also gathered with less difficulty.

Pyramids are dwarf trees with a clear main stem one foot in height, and with branches radiating from a continuation of the stem, the upper ones gradually diminishing in length. They are suitable for gardens. Bush trees are a kind of miniature standard, with a clear stem of one foot or so, and a head of branches. These worked on the Paradise stock are the best form of tree for large or small gardens, because they make a neat, compact growth, and fruit freely. Espalier trees are to be had in various forms, but the most popular one is the horizontal espalier. This has a central main stem, with lateral or side branches growing at right angles on each side. This form of tree can be trained to trellises by the side of garden paths, or to walls or high fences. Another type of the espalier is the gridiron. This has a short main stem, then a branch trained horizontally on each side, and from these vertical

shoots are trained up 18in. apart, the tree ultimately being of the shape of a gridiron. Suitable for walls only.

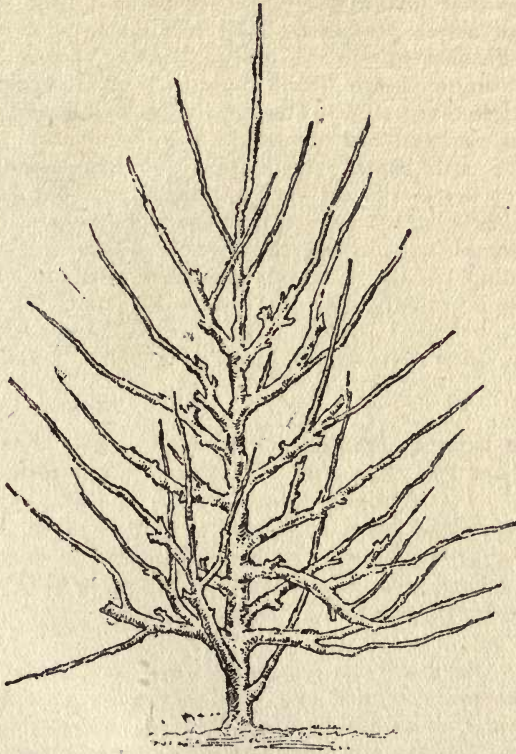


Fig. 5. AN ESTABLISHED PYRAMIDAL-TRAINED APPLE TREE.

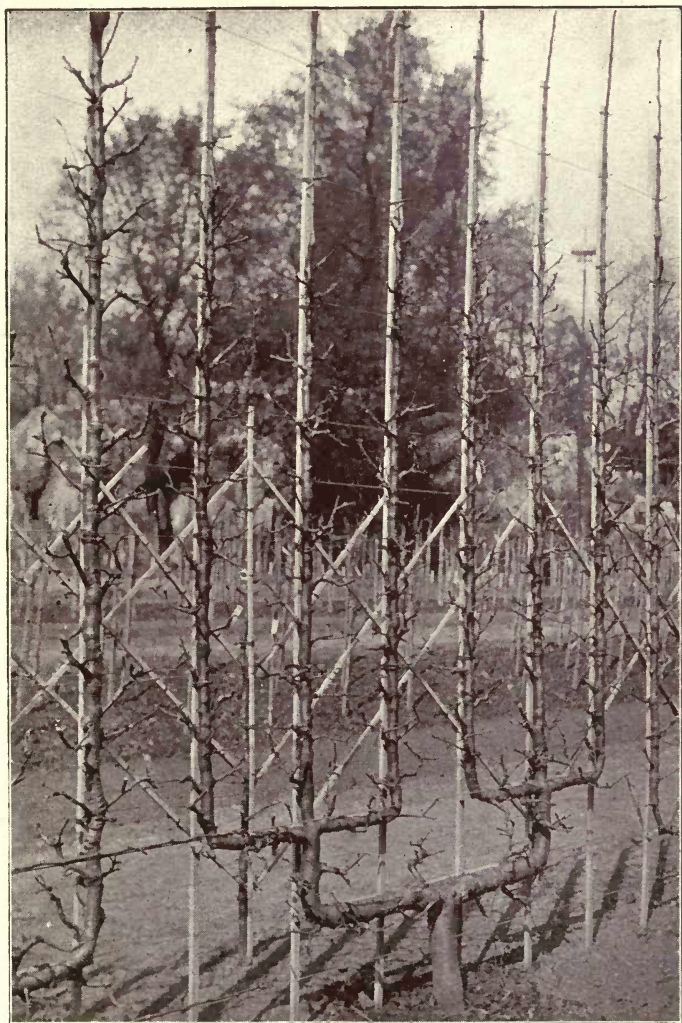
The branches have been kept well thinned out, and the trees lifted and root pruned periodically so as to maintain a well-balanced and fruitful growth.

Oblique or fan-trained trees are sometimes met with, the main branches being trained at an angle of 45 deg. These are adapted for lofty walls.

Last of all, there is the cordon, a most useful form of tree for growing against low fences, walls, arches, or on trellises. The tree is of French origin, and its culture is so simple that anyone may grow apples with great success in any of above positions. The tree consists of a main stem, with side spurs, and no branches. This is known as the "single cordon," and it can be trained vertically or at an angle of 45 deg. There are also double and triple-stemmed cordons, but the single one is the best. Then there are also single and double-stemmed horizontally-trained cordons. These have a main stem about one foot high, with a lateral stem trained at right angles, or two lateral stems, one trained each way. These are suitable for planting by the side of a garden path, the lateral branches eventually meeting each other, and forming a continuous rope of growth. They are ideal trees for small gardens, and are capable of bearing exceptionally fine fruit.

Distances for Planting.—Standard trees should be planted not less than 24ft. apart each way; 30ft. would be better. Half-standards may be 20 to 24ft.; pyramids and bush-trained trees, 12 to 18ft.; espaliers, 18ft.; double horizontal cordons, 20ft.; single horizontal cordons, 10ft.; single cordons, 18in. to 2ft.; and bush trees on the Paradise stock, 6 to 8ft. apart.

Soil.—The ideal soil for apple trees is a marly loam; but, as everyone cannot have this, they must make the best of such soil as naturally exists in their gardens. Chalky and gravelly soils are most unsuitable, as the trees soon get stunted in growth, are subject to canker, and also unfruitful. Damp, waterlogged soils are also unsuited to successful apple culture. Clay soils, if well drained, will grow apples well, and so will rich alluvial soils. Light, sandy soils rarely produce good growth or induce fruitfulness. Where soils are of a chalky or gravelly nature, holes should be dug out at least 6ft. wide and 3ft. deep



A GRIDIRON-TRAINED APPLE TREE.
See Chapter on Training, page 242.



A FAN-TRAINED APPLE TREE (COX'S ORANGE PIPPIN).

for each tree, and filled with good loam. Clay soils should be trenched 3ft. deep, and have plenty of grit, decayed refuse, and a little lime mixed with them. Soils of a light character would be benefited by the addition of clay and lime. Soils of a loamy nature will require no special treatment, since they are well suited to the growth of the apple.

Aspect.—The main point in this connection is shelter from north and east winds. This is especially necessary

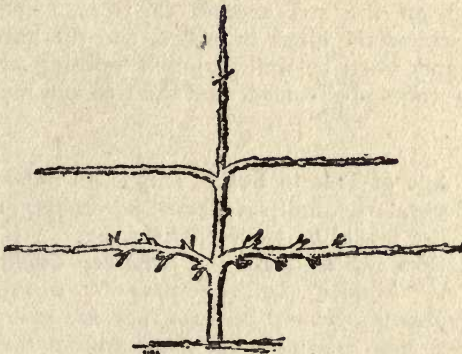


Fig. 6. AN ESPALIER-TRAINED APPLE TREE.

The tree is four years old. Note the fruit spurs forming on the lower branches. The short cross line on the main shoot shows where to prune to in winter to secure two more new branches the next season.

during the flowering period, as the blossom being somewhat tender is easily injured by cold. The apple usually thrives best on land that slopes to the south, south-east, or west, and sufficiently elevated to be out of the frost line. Low-lying positions do not suit either the setting of the fruit or the ripening of the wood.

When to Plant.—The best time to plant apples is during October and November, whilst the soil still retains the remnants of summer warmth. The roots then take kindly to the soil, and soon establish themselves. But planting

may take place any time up to March, provided there is no frost, and the soil is not too wet. Many amateurs make the mistake of planting as late as March. If a long spell of hot, dry weather should follow, the buds will start to grow, and feed upon the reserve sap in the wood before new roots have a chance of forming and replenishing the supply. The result will be a cessation of growth, the young growths and foliage will be stunted, and the tree be either severely crippled or it will die. If such late planting cannot be avoided, a heavy mulch of manure should be placed on the soil around the tree, some haybands twisted around the lower branches, and the latter, as well as the upper part, be well syringed morning and evening until new roots are formed, and the tree can make healthy growth.

What Age of Tree to Buy.—This is an important question. If standards, half-standards, pyramids, or espaliers, the best age would be three to four years. If bushes or cordons, then two to three year old trees would be a suitable age. Maiden—i.e., one-year-old trees—are preferred by many growers, because they are easier to establish in their new quarters; but these are not recommended to those who have had a limited experience in fruit culture, for the simple reason that technical knowledge is essential to prune them in such a way that they shall make good specimens in future. Trees that have been trained by experts for three or four years usually have their future shape properly determined, and their after-training consequently becomes easier.

Treatment of Newly-bought Trees.—When the trees arrive from the nursery they should be unpacked and the roots examined. If any of the roots are bruised, the injured portions should be cut back to healthy tissue, so as to make a clean wound; otherwise, when planted, the bruised parts will decay and canker follow. If the roots, moreover, are dry, immerse them for a few hours in water.

If they cannot be planted at once, open a trench, and place the roots in this, covering them with soil. Should frosty

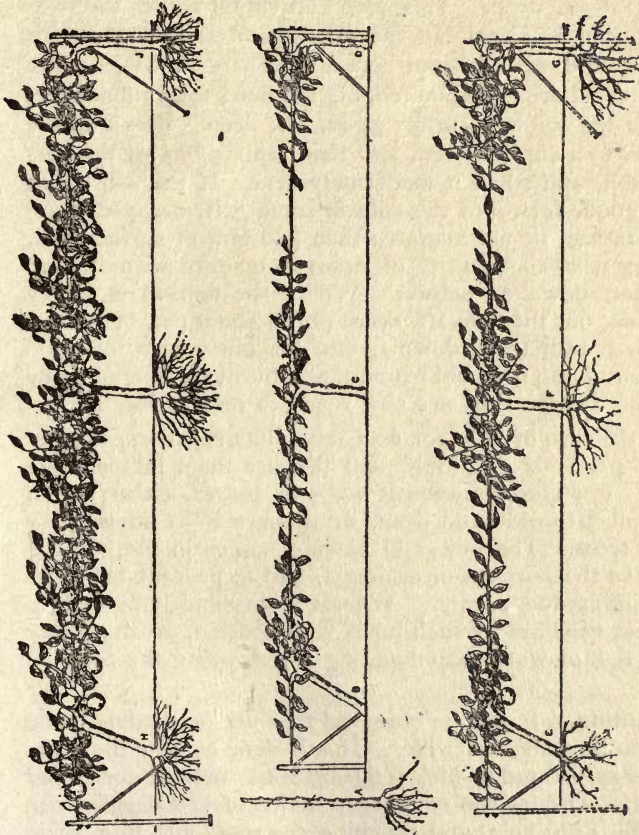


Fig. 7. HORIZONTALLY-TRAINED CORDON APPLE TREES.

(A) is a maiden tree shortened in winter to twenty inches from the ground. The new branches are trained right and left so as to eventually meet as shown in the upper illustration.

weather prevail when the trees arrive do not unpack them, but place them in a cool shed, and keep the packing material moist.

Preparing the Site.—The first thing is to get the site ready for the reception of the trees. If they are to be grown in a special plot by themselves the soil should be trenched 3ft. deep. This deep cultivation serves the two-fold purpose of draining the surface soil and encouraging a free and healthy root action. Where, however, only single trees are to be planted, dig out holes 6ft. in diameter, and, if the soil is naturally good, 1ft. deep. Break up the subsoil to a depth of 1ft., and then replace 6in. of the surface soil, and tread it moderately firm. If the soil is not very good, fork into the subsoil some grit, decayed vegetable refuse, or old manure; then add 6in. of surface soil, mixing a small quantity of decayed manure with it, and treading down as before. Where the subsoil is heavy clay, dig out the hole 2ft. deep, put in about 6in. of stones, and well ram these down. On this place 18in. of good soil containing grit, old manure, and burnt earth, and make it firm. These sites are now ready to receive the trees.

In the case of sites for wall trees, like espaliers, dig out holes 4ft. wide and long, and prepare them in the same way. For cordons against walls or fences, either trench the soil 3ft. wide and deep, or prepare it as advised for other trees. The object of placing stones in the holes is to serve the purpose of drainage, and to prevent tap-roots descending too deeply. Wherever possible it is well to connect the base of such holes with a drain, so that there is no risk of water accumulating and flooding the roots.

Planting.—It will be observed that we have advised the sites to be made 6ft. wide. This is done so that the roots can be spread out to their full length, not twisted nor curled round. The far too common practice of just digging out a small, deep hole, and ramming the roots into this, is responsible for so many trees failing to thrive. In the case of standard trees, a stake not less than 2in. in diameter and 6 to 8ft. long should be driven 2ft. deep into the centre of each site. For half-standard trees the stakes should

be 4 to 6 ft. long; and for pyramids and bushes 3 to 4ft. long.

Next comes the actual planting. Place the tree in the centre of the hole, and if its main roots—as would be probable in the case of Crab or Free stocks—have a downward

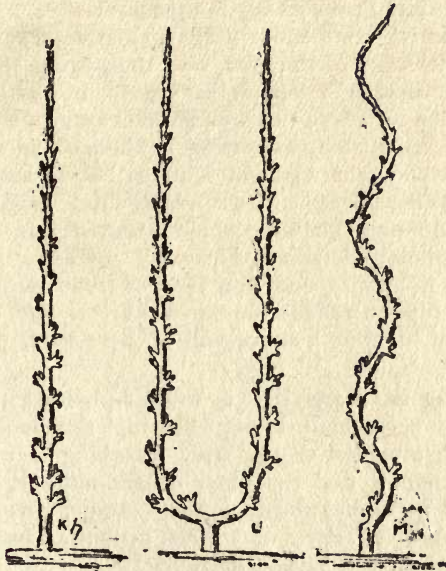


Fig. 8. VERTICALLY-TRAINED CORDON APPLE TREES.

The left-hand tree is a single-stemmed Cordon; the middle one a double-stemmed one; and the third a zig-zag one.

habit of growth, and not spreading, take out a little soil to admit them; but if they are horizontal and spreading, then arrange them horizontally on the surface. Sprinkle enough fine soil, free from manure, over the roots; then give the tree a gentle upward jerk to settle the mould about them. Add more soil, and gently tread this down. Continue adding more soil and firming it until the hole is filled.

As a general rule, 6in. is an ample depth of soil to place over the roots. A safe guide, however, is the soil mark on the base of the stem. Plant so that this mark is level with the soil, and then the grower will not do far wrong. Some growers recommend, in the case of very heavy soils, to plant on the surface and cover with a mound of soil. In such a case firm staking is necessary.

The planting completed, wrap a narrow piece of sacking around the stem of the tree, and then bring this and the stake together, and loosely secure them with a ligature of stout twine. These ties should be examined from time to time, and readjusted, as, owing to the sinking of the soil, the tree would otherwise get "hung," so to speak, on the stake. Where trees are grown against walls or fences they should only be temporarily secured, the permanent fastening being deferred till spring. During the winter it may be necessary now and then to tread the soil in fine weather only, to render the surface firm. On light soils, too, a mulching of manure will be beneficial.

Labelling the Trees.—It is well at planting time to see that good permanent labels, bearing the name of each variety, is attached to the tree. Nothing is more disappointing than to find that later on the name is lost. The best of all permanent labels is the "Acme," made of iron, with white raised letters on a black ground. These, secured by lead wire, will last a lifetime.

Manuring Apple Trees.—This subject is dealt with in a separate article in Part II. of this book.

Mode of Bearing.—Fruit is borne on naturally-formed spurs on the older wood. Such spurs may be easily recognised in summer by their stubby appearance, and by their being surrounded by a whorl of leaves. Further, fruit is also borne on artificially-formed spurs created at the base of shoots which have been summer and winter pruned. Fruit buds are usually globose in shape, whereas

growth buds are narrow and pointed. In the case of shoots that are not pruned, as in that of standard trees, fruit

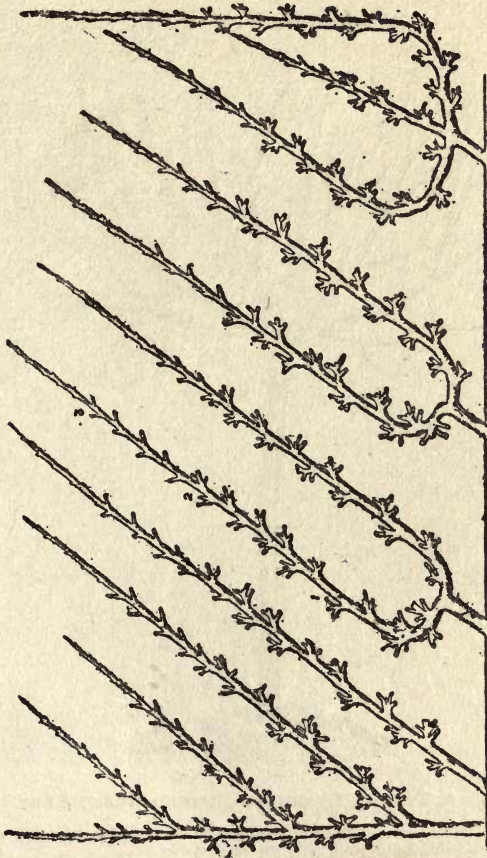


Fig. 9. CORDON FRUIT TREES TRAINED AT AN ANGLE OF 45 DEG.

The end trees are so trained that the whole of the fence or wall is furnished with fruitful growth. Excellent trees for small gardens.

buds form naturally at their base, and thus a constant succession of fruit buds is maintained on each healthy tree. (See Fig. 11.)

Summer Pruning.—Summer pruning is practised on trained trees, as pyramids, bushes, espaliers, and cordons, but not standards. It is usually done in July and August,

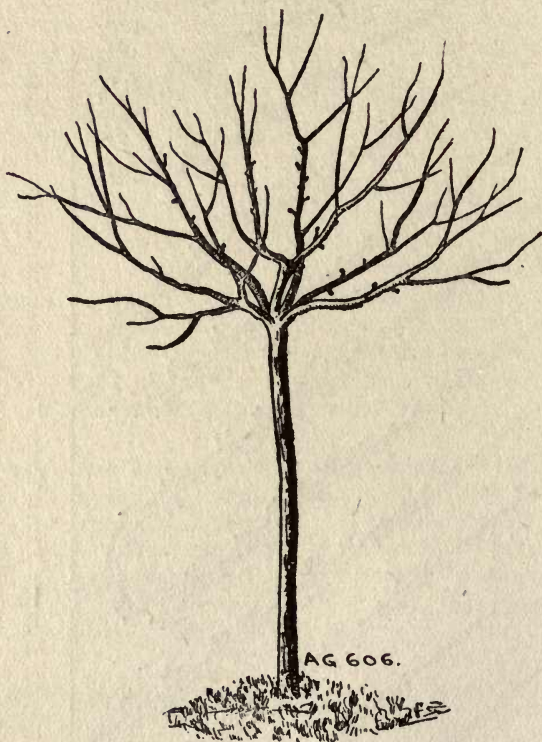


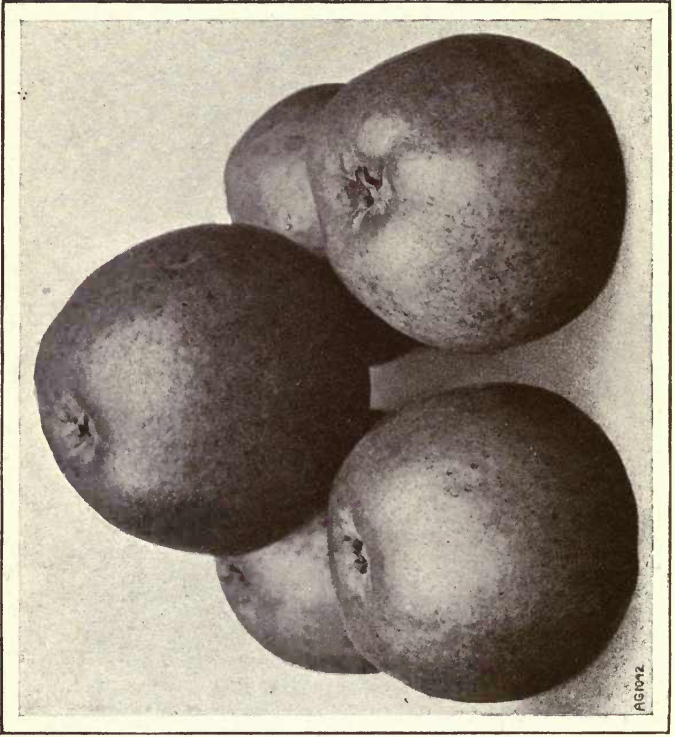
Fig. 10. A TYPICAL STANDARD-TRAINED APPLE TREE.

Pears, Plums, Cherries, and Walnuts are grown in a similar manner. Note the tree has a well-balanced head with an open centre.

and again in September. In the first instance all leading shoots—i.e., those that grow at the ends of the branches—should be permitted to grow about a foot in length, then



A FRUITFUL BUSH APPLE TREE.
A four-year-old tree grafted on the Paradise Stock.
Variety: Allington Pippin.



CULINARY APPLE, NEWTON WONDER.

Season: November to April.

have their points removed. Should any secondary shoots develop from these, shorten them to one leaf. All other shoots that develop from the side branches shorten to four leaves. Any subsequent growths that form should be shortened to one leaf. In September any growth made since the July pruning should, in the case of laterals,



Fig. 11. APPLE SHOOTS.

The right-hand shoot is one year old and furnished with wood buds.
That on the left is two years old and bearing fruit spurs.

be shortened to six leaves, and leading shoots to about a foot. By summer pruning thus, trees are encouraged to make fruit buds freely, and to form better specimens than if left unpruned.

Summer pruning should be done a little at a time, not all at once. It is a very great mistake to remove a lot of foliage at one time. We have already intimated that standards do not require summer pruning, except in the first year or two, and the same remarks apply to half

standards. Such trees, growing as they are on free stocks, are best allowed to grow naturally; then they will develop fruit spurs freely at the base of their shoots. The pernicious system of cutting back the young growths in summer only leads to the production of a mass of weak lateral growths and few fruit buds.

Winter Pruning.—When apple trees have been judiciously summer pruned, the winter pruning is a comparatively simple matter. Summer pruning is practised with the view to promoting the formation of fruit buds, and winter pruning for the encouragement of future healthy new growth, and improving or maintaining the symmetry of the tree. Thus in winter, in the case of bushes or pyramids, all lateral shoots that were shortened in summer to four leaves will require to be pruned to the third bud from their base. Leading shoots—i.e., those growing at the extremities of the branches, and which were summer pruned to a foot—will need to be cut back according to their vigour, and to such an extent as will maintain the symmetry of the tree. Thus, one shoot may only need shortening to six or eight buds, another to four buds, and so on. Again, shoots that are very vigorous require less shortening than a weak one. To cut back severely a very strong shoot would encourage excessive growth the following season; and to fail to prune a weak shoot sufficiently would tend to promote still weaker growth another season. All weak growths in the centre of a tree should be entirely removed.

Cordons and espaliers require all lateral growths to be pruned to three buds, and the leaders left untouched until the tree has reached its allotted height or length. Standards and half-standards merely require to have their branches thinned out where crowded, and the centre of the tree kept well open. There should be no shortening of the shoots; they should be left to grow unrestrictedly. For further details, see article on "Pruning" elsewhere.

Root Pruning.—This is a most important phase of fruit

culture. It is practised only in the case of trees that are making a too-vigorous growth and producing too few fruit buds. Such trees are benefited by having their strongest roots shortened, so as to preserve a more even balance between root and branch. Thus, in the case of pyramids, standards, half-standards, etc., grown on the Crab or Free stock, the roots have a tendency to grow large, produce few fibrous roots, and to form vertical or tap roots which descend deeply into the soil. To shorten these judiciously, therefore, is to encourage the development of a more fibrous root growth and the production of less vigorous branch growth, with a corresponding greater increase of fruit buds. A tree that is not making strong growth, and yet not forming fruit buds freely, does not require root-pruning. What it requires is careful lifting and replanting in richer soil, to encourage a freer growth. Trees worked on the Paradise stock rarely require root-pruning, and then only in a moderate degree. Fuller details are given in the chapter on "Pruning" in Part II.

Unfruitful Trees.—There are thousands of trees growing in gardens and orchards that fail to yield satisfactory crops of fruit. Many of them yield an abundance of blossom, but fruit fails to form. This failure is due to the overcrowding of fruit spurs, this preventing the blossoms expanding fully, or so crippling their growth that they become sterile. Another cause is a too exposed or too damp position, the organs of fructification being injured by frost or damp. The remedy in the first case is freely thinning out the spurs in early spring, so as to give the remainder more room to develop; and in the second to plant in a more sheltered position, and in a more elevated spot.

Trees, again, that produce few fruit buds, have either been over or insufficiently pruned both in root and branch. The wholesale removal of shoots at one time in summer is another fertile cause of unfruitfulness. If trees are

planted, pruned, and otherwise properly managed on the lines laid down in this chapter, they will not fail to yield good crops. Unfruitful, neglected, and sickly trees should not be tolerated, but consigned to the fire. No art or skill can ever render such trees fruitful or healthy in growth.

Trees on Walls and Fences.—In small gardens the mistake is too frequently made of planting unsuitably-trained trees against the usually low boundary walls and fences. As a rule, these do not exceed 6ft. in height, and to plant espalier or fan-trained trees against them is sheer folly. In three or four years the trees reach the top, and then severe pruning is resorted to to keep growth within bounds. The result is a thicket of useless growth at the top, and no fruit. Espaliers and fan-trained trees are only suitable for lofty walls, 8 to 12ft. or more in height. For walls and fences only 6ft. high cordon trees are a more suitable type of tree to grow. These can be kept within due bounds without any sacrifice of fruitfulness.

Thinning the Fruit.—It is especially necessary in the case of apples grown on cordon trees not to allow too many fruits to develop. Overcropping seriously cripples future growth; and, besides, the individual fruits do not attain their full size, nor develop their proper flavour. As a general rule, one to two fruits to a spur are ample. Therefore thin out the fruits as soon as it can be seen which are the most promising ones to retain. If this course be pursued, trees will bear every year; whereas, if the fruit is not thinned, they will fail to yield the next season. (See Figs. 12 and 13.)

Gathering and Storing the Fruit.—A good deal of judgment is required in gathering fruit, more especially varieties that have to be stored. If gathered too soon the fruit will shrivel and lose much of its flavour. Early sorts should not be gathered until they begin to fall from the tree, and later ones not until they part readily from the

branch on being grasped by the hand. Fruit that requires to be twisted or pulled hard from the branch is not fully ripe. Gather the fruit only in dry weather, and place carefully into the basket or tray so as not to bruise the skin. Apples should always be stored in a cool, damp place, not in hot, dry positions. Cellars or outhouses, where there is no risk of frost entering, are the best store places for apples. They will keep very well in boxes or barrels; but choice sorts are best stored in single layers on open trays, such as Orr's, these being placed one on



Fig. 12.

CLUSTER OF APPLES
UNTHINNED.

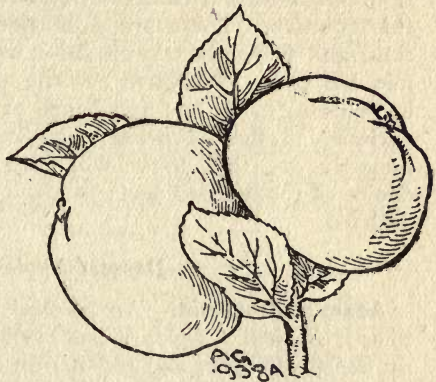


Fig. 13. CLUSTER OF APPLES THINNED.

the other so as to form a kind of nest. Dry cupboards or rooms are unsuitable, as they cause the fruit to shrivel. Fruit rooms specially constructed, and described elsewhere, are, of course, the best positions for storing fruit.

Pests.—The chief pests that do damage to the apple are the Codlin, Winter, March, Mottled Umber, Brown Tail, Small Ermine, Pith, Bud, Lackey, and Tortrix Moth Caterpillars; Apple Blossom Weevil; Apple Sawfly; Apple and Woolly Aphis (American Blight); Apple Sucker; and

the Mussel and Oyster Shell Scales. These are referred to in detail, together with remedies for their eradication, in a special chapter further on.

Diseases.—The apple is subject to attack by the following diseases: Mildew, Scab, Canker, Brown Rot, Coral Spot, and Leaf Scald. These are also dealt with further on in this volume.

Varieties.—We shall confine ourselves to giving a selection rather than a complete list of the varieties grown in this country. There are over 2,000 varieties in cultivation, and to enumerate all these would, indeed, be a formidable task. We have not the space, if we had the inclination, to do so; and hence we shall limit our list of varieties to the following selections, believing, as we honestly do, that these will give the reader an ample choice of really good sorts to grow either in the garden or orchard.

Dessert Apples.

Adam's Pearmain.—An attractive apple. Size, large. Shape, conical. Colour, pale yellow, green, and russet on the shady side, and reddish on the sunny one. Flesh, sugary and richly flavoured. Very fertile. Moderate grower. Season, January to March. Self-fertile.

Allen's Everlasting.—A good late apple. Size, medium. Shape, flat. Colour, yellow, streaked with red. Flesh, juicy and aromatic. A neat grower. Season, April to May. Gather fruits in November. Self-fertile.

Allington Pippin.—A similar apple to Cox's Orange Pippin, but hardier. Size, medium. Shape, round to conical. Colour, yellow, flushed with scarlet, sprinkled with russet. Flesh, firm and richly flavoured. A very fertile variety. Season, November to February. Self-sterile.

Beauty of Bath.—An excellent early apple. Size, medium. Shape, round. Colour, bright red with white spots. Flesh, greenish-white, and of pleasing flavour. Most prolific. Season, July and August. Self-sterile.

Blenheim Orange.—Good for dessert or cooking. A favourite old apple. Size, large. Shape, round. Colour, golden yellow, flushed with red. Flesh, richly flavoured. Season, November to February. Rather slow in coming into bearing. Self-sterile.

Charles Ross.—A seedling from Cox's Orange Pippin. Size, large. Shape, round. Colour, yellow, flushed with crimson. Flavour, rich. Season, October to November. Good exhibition apple. Self-sterile.

Christmas Pearmain.—One of the best dessert apples for small gardens. Size, medium. Shape, round or conical. Flavour, brisk and pleasing. Colour, orange, with silvery and russet markings, flushed crimson on sunny side. Season, December. Self-fertile.

Cox's Orange Pippin.—The premier dessert apple. A descendant of the famous Ribston. Size, medium. Shape, round. Colour, rich orange and bronzy-red. Flavour, juicy and very rich. Should not be gathered till quite ripe to ensure fruit keeping well. Requires a warm, rich soil. Season, November to February. Self-sterile.

Devonshire Quarrenden.—An old, but good early apple. Size, small. Shape, flattish round. Colour, purplish-red. Flesh, crisp and juicy. Heavy cropper. Season, August to September. Self-fertile.

Duke of Devonshire.—A fine late apple. Size, medium. Shape, round. Colour, greenish-yellow, marked with black spots and russet patches. Flavour, sweet and aromatic. Season, March to May. Self-fertile.

Ellison's Orange.—A good October apple. Size, medium. Shape, round. Colour and flavour similar to Cox's

Orange Pippin. Vigorous grower and free bearer. Season, October. Self-sterile.

James Grieve.—A variety resembling Cox's Orange Pippin, but hardier. Size, medium. Shape, round. Colour, primrose, striped red, with white spots and russet patches. Flavour, sweet and very refreshing. A first-rate cropper. A grand sort for small gardens. Season, September and October. Self-fertile.

Kerry Pippin.—An old Irish apple. Very hardy, and a prolific bearer. Size, small. Shape, round. Colour, yellow, marked or striped with brownish-red. Flavour, brisk, sweet, and pleasing. Season, September and October. Self-fertile.

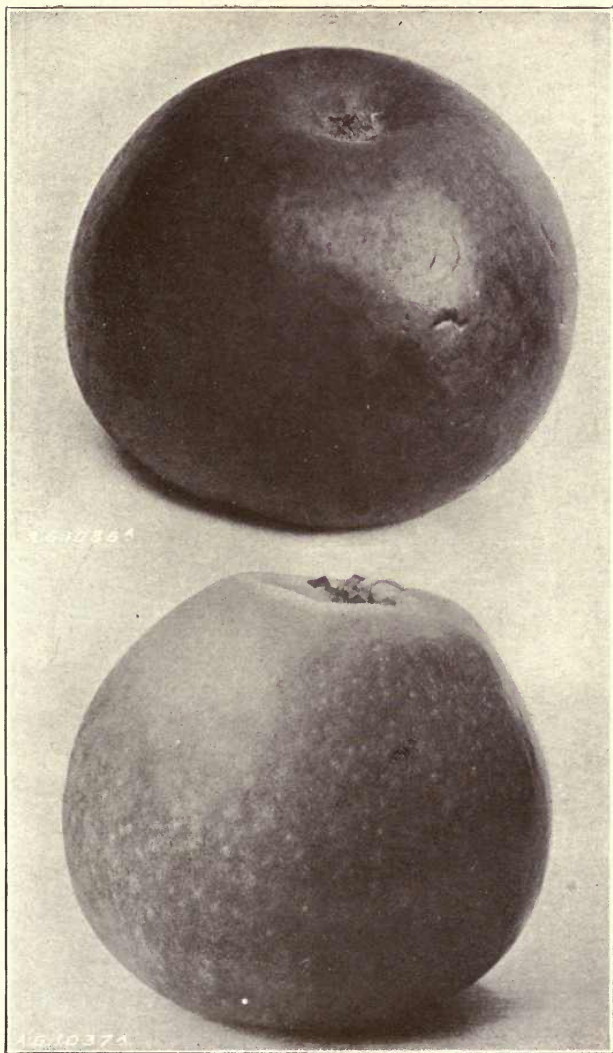
King of the Pippins.—An old favourite, suitable for warm districts and light or medium soils. Size, medium. Shape, conical. Colour, rich golden-yellow. Flavour, sweet and pleasant. Season, October to January. Liable to canker on heavy soils. Self-fertile.

King's Acre Pippin.—A good late apple. Size, medium. Shape, round. Colour, brownish-orange, splashed with silvery-russet, and with a pretty red cheek. Flavour, juicy and rich. Season, January to March. Self-fertile.

Lord Hindlip.—A delicious late apple. Size, medium to large. Shape, conical. Colour, yellow, scarlet, russet, and crimson. Flavour, delicious and rich. Season January to May. An excellent bearer. Self-fertile.

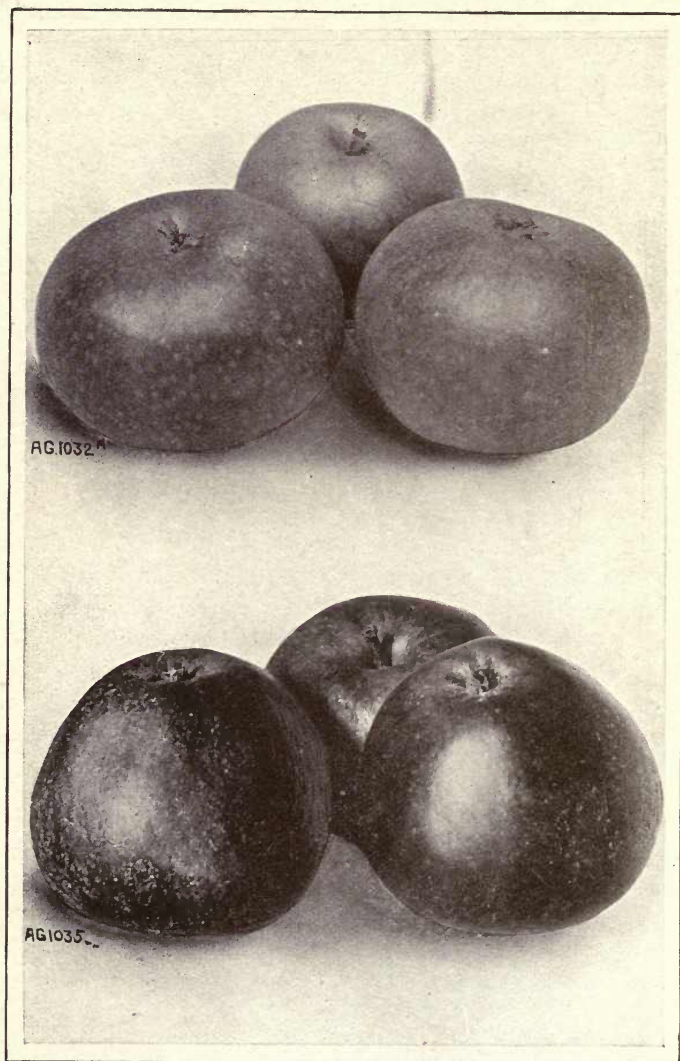
Mrs. Phillimore.—A very fertile late apple. Size, large. Shape, round or conical; ribbed. Colour, primrose, marked with russet and dull red. Flavour, very sweet and aromatic. Season, November to February. Good for cordons or bushes. Self-fertile.

Peasgood's Nonsuch.—A very large and handsome apple, good alike for dessert or cooking. Size, extra large. Shape, round. Colour, pale yellow, striped with



TWO DESSERT APPLES.

Upper variety: Charles Ross (October to November); lower one:
Allington Pippin (November to February).



TWO DESSERT APPLES.

Upper variety: Beauty of Bath (July and August); lower variety: Worcester Pearmain (September).

crimson. Flavour, sweet. Season, October to December. Fine for exhibition; also for cordons on walls. Rather slow in coming into bearing. Self-sterile.

Ribston Pippin.—The finest flavoured apple in cultivation. Size, medium. Shape, round, angular. Colour, brown with russet. Flavour, delicious. Flesh, crisp. Season, November to January. Requires a warm, medium soil. Moderate bearer. Self-fertile.

Ross's Nonpareil.—Another old Irish apple. Size, small. Shape, round. Colour, russety, marked with bronzy-crimson. Flavour, sugary and aromatic. A very prolific variety. Season, November and December. Self-sterile.

Scarlet Nonpareil.—A very excellent dessert apple. Size, small. Shape, round. Colour, yellowish, streaked with red on the shady side, and with deeper red on the sunny side; also speckled with russet. Flavour, rich, juicy, and sugary. Season, January to March. Self-fertile.

Sturmer Pippin.—A grand late apple. Size, medium. Shape, roundish and flattened. Colour, yellowish-green, tinged with dull red on the sunny side, and covered freely with russet. Flavour, juicy, brisk, and sugary. Season, March to June. Self-fertile.

Summer Golden Pippin.—A delicious summer apple. Size, very small. Shape, round. Colour, bright yellow, tinged with russet, orange, and brownish-red on the sunny side. Flavour, very rich, juicy, and sugary. Season, September. Good for a small garden. Self-fertile.

William Crump.—A comparatively new apple—a seedling from Cox's Orange Pippin. Size, large. Shape, round. Colour, rich red. Flavour, rich and sugary. Season, December. Self-sterile.

Worcester Pearmain.—A popular early apple. Size, medium. Shape, conical. Colour, yellowish and bright scarlet. Flavour, sweet and very pleasing. Season,

September. A good bearer, and a first-rate sort for small gardens. Partly self-fertile.

New Dessert Varieties.—Two new varieties recently placed in commerce and full of promise as a distinct advance on older kinds are: Bedford Pippin, a variety of the Ribston type with yellow, red-streaked fruit and yellowish, firm, sweet, juicy flesh (September to October); and Beauty of Bedford, a cross between Lady Sudeley and Beauty of Bath, bright red, streaked with yellow, flesh yellowish, firm, juicy and sweet (September).

Culinary Apples.

Alfriston.—One of the best culinary apples. Size, large. Shape, roundish and angular. Colour, greenish-yellow, netted with russet. Flavour, sweet and juicy. Season, November to March. A free bearer, and good for light soils. Fruit must not be gathered until early in November. Self-sterile.

Annie Elizabeth.—Another good culinary apple which also possesses some merit as a dessert fruit. Size, large. Shape, round and ribbed. Colour, bright yellow, streaked with deep red. Flavour, crisp and juicy. Season, December to April. Bears freely when established. Self-fertile.

Bismarck.—A really good late cooking apple for all forms of culture. Size, large. Shape, round. Colour, a rich crimson. Flavour, a trifle acid. Free bearer, and splendid cooker. Season, October to February. Self-sterile.

Bramley's Seedling.—A good apple for small gardens or for growing in heavy soils. Size, large. Shape, round and flattish. Colour, green. Flavour, sub-acid. Season, December to May. Prolific cropper. Self-fertile.

Cox's Pomona.—A handsome apple. Size, medium. Shape, round to flat. Colour, yellow, striped crimson. Flavour, juicy and acid. Season, October. Self-fertile.

Duchess of Oldenburgh.—A handsome early apple. Size, medium. Shape, round; ribbed. Colour, yellow,

streaked with crimson. Flavour, sharply acid. Season, August and September. A prolific variety, doing well on bushes or cordons. Self-fertile.

Early Victoria.—A very early and prolific apple. Fruits freely when quite young. Size, medium. Shape, round to conical. Colour, yellow. Flavour, briskly acid. Season, July to September. Self-fertile.

Ecklinville Seedling.—One of the Codlin type, and a free bearer. Size, very large. Shape, round, flattened. Colour, greenish-yellow. Flavour, moderately acid. Season, September to November. Good cooker. Self-fertile.

Edward VII.—A late variety, resembling Golden Noble. Size, large. Shape, round. Colour, clear bright yellow. Flavour, similar to that of Blenheim Orange, one of its parents. Season, January to June. A remarkably free bearer and good keeper. Self-sterile.

Golden Noble.—A good sort for small gardens. Size, large. Shape, round. Colour, yellow. Flavour, sweet. Season, November to January. Good cropper. Self-fertile.

Golden Spire.—A fine hardy, free-bearing apple, not subject to canker. Size, large. Shape, conical. Colour, golden-yellow. Flavour, sweet and pleasing. Season, October to December. Good cooker, and splendid for small gardens. Self-fertile.

Grenadier.—A variety of the Codlin type, which rarely fails to yield good crops. Size, very large. Shape, round and flat. Colour, yellow. Flavour, briskly acid. Season, September and October. Self-sterile.

King's Acre Bountiful.—A comparatively new apple of sterling merit. Size, large. Shape, round or conical. Colour, yellow, with a pink flush. Flavour, excellent. Season, September to November. Self-fertile.

Lane's Prince Albert.—One of the best late apples. Size, large. Shape, round. Colour, greenish-yellow, with a pale red tint. Flavour, briskly sub-acid. Season, November to March. Heavy cropper. Self-sterile.

Loddington.—A popular market variety. Size, very large. Shape, round. Colour, greenish-yellow. Flavour, acid. Season, August to December. Self-fertile.

Lord Derby.—A fine variety for heavy soils, and a free bearer. Size, very large. Shape, round; ribbed. Colour, greenish to golden. Flavour, sweet and pleasing. Season, November and December. Self-fertile.

Lord Grosvenor.—One of the Codlin type. Good for small gardens. Size, very large. Shape, conical. Colour, yellow. Flavour, juicy, moderately acid. Season, August and September. Self-fertile.

Newton Wonder.—A Derbyshire apple, which originated as a seedling in the Hardinge Arms garden, at King's Newton, Melbourne; Derbyshire. One of the best late apples in cultivation. Size, medium. Shape, round. Colour, brownish-yellow, marked with russet and crimson, with black dots. Flavour, sub-acid and pleasing. Season, November to April. A free cropper. Self-fertile.

Pott's Seedling.—An excellent second early cooking apple, good for small gardens. Shape, round to conical. Colour, yellow. Flavour, slightly acid. Season, August to October. Liable to canker on heavy soils. Self-fertile.

Red Victoria.—A showy early apple. Abundant bearer. Size, large. Shape, conical. Colour, brilliant crimson. Flavour, excellent. Good for small gardens. Self-fertile.

Rev. W. Wilks.—A new apple of promising merit. Size, very large. Shape, round. Colour, greenish-yellow. Flavour, good. Season, October. Self-fertile.

Royal Jubilee.—Good late-flowering and free-bearing apple. Size, large. Shape, conical. Colour, yellow. Flavour, briskly acid. Season, October to February. Good sort for Northern gardens. Self-fertile.

Sanspareil.—One of the most prolific apples in cultivation, and handsome withal. Size, large. Shape, conical. Colour, lemon-yellow, striped with carmine. Flavour, sweet and spicy. Season, February to April. Self-fertile.

Stirling Castle.—A grand apple for small gardens. A prolific bearer. Size, large. Shape, round and flattened. Colour, yellow. Flavour, juicy and briskly acid. Season, October to December. Self-fertile.

The Queen.—A very handsome apple. Size, large. Shape, round and flattened. Colour, yellow, streaked with red. Flavour, sweet and pleasing. Season, October to December. Self-sterile.

Tower of Glamis.—A hardy and prolific variety, much grown in Scotland. Size, large. Shape, conical and angular: Colour, yellow. Flavour, sweet. Season, November to February. Self-fertile.

Warner's King.—A very hardy and prolific apple. Fruit attains an immense size. Shape, round and angular. Colour, greenish-yellow. Flavour, sub-acid. Season, November. Self-sterile.

Selections for Various Purposes.

Dessert Apples for the North.—Allington Pippin, Beauty of Bath, Devonshire Quarrenden, James Grieve, Kerry Pippin, Ribston, Lord Hindlip, Charles Ross, Ellison's Orange, William Crump, Worcester Pearmain, Sturmer Pippin, Cox's Orange Pippin, and King of the Pippins. The last two would do best on a south or south-west wall.

Culinary Apples for the North.—Bramley's Seedling, Early Victoria, Golden Spire, Golden Noble, Lord Derby, Newton Wonder, Pott's Seedling, Stirling Castle, Royal Jubilee, Annie Elizabeth, Lane's Prince Albert, and Warner's King.

Dessert Apples for the Midlands.—Allington Pippin, Adam's Pearmain, Cox's Orange Pippin, Allen's Everlasting, Kerry Pippin, King of the Pippins, Scarlet Nonpariel, Ellison's Orange, Duke of Devonshire, Sturmer Pippin, Peasgood's Nonsuch, Worcester Pearmain, and James Grieve.

Culinary Apples for the Midlands.—Lord Grosvenor, Warner's King, Ecklinville Seedling, Golden Noble, Newton Wonder, Golden Spire, Pott's Seedling, Bramley's Seedling, Alfriston, Annie Elizabeth, Grenadier, and Tower of Glamis.

Dessert Apples for the South.—Any of the varieties named in the list of twenty-five, especially including Cox's Orange, Ribston Pippin, and King of the Pippins.

Dessert Varieties Suitable for Standards.—Beauty of Bath, Kerry Pippin, Scarlet Nonpariel, Cox's Orange Pippin, Duke of Devonshire, Sturmer Pippin, King of the Pippins, Allen's Everlasting, Blenheim Orange, Summer Golden Pippin, Charles Ross, and William Crump.

Culinary Varieties to Grow as Standards.—Duchess of Oldenburgh, Pott's Seedling, Stirling Castle, Lane's Prince Albert, Golden Spire, Ecklinville Seedling, Alfriston, Golden Noble, The Queen, Warner's King, Bramley's Seedling, and Lord Derby.

Dessert Varieties to Grow as Cordons.—Adam's Pearmain, Beauty of Bath, Charles Ross, Christmas Pearmain, James Grieve, Allington Pippin, Scarlet Nonpariel, Sturmer Pippin, Cox's Orange Pippin, King of the Pippins, Ribston, and William Crump.

Culinary Varieties to Grow as Cordons.—Annie Elizabeth, Bismarck, Bramley's Seedling, Duchess of Oldenburgh, Early Victoria, Golden Spire, Lord Derby, Pott's Seedling, Lane's Prince Albert, Sanspariel, Tower of Glamis, and Warner's King.

Any of the fifty varieties described may be grown as bushes, pyramids, or espaliers.

CHAPTER II.

The Apricot.

THE APRICOT (*Prunus Armeniaca*) is one of the most delicious of our hardy fruits. It is said to have been first introduced into this country from Italy by one Wolff, gardener to King Henry VII. The Chinese are reputed to have cultivated it for some 3,000 years before the Christian era; and we learn also that it has long been grown in Northern India and Thibet. It was known to the ancient Greeks and Romans. Dioscorides, a Greek writer, refers to it under the name of Armenia; and Pliny, the Roman naturalist, also mentions it under that of "Præcocia" in the first century of the Christian era. The latter states that the Apricot had then been introduced into Italy about thirty years.

The Apricot does not appear to have been grown very largely for some time after its introduction. Quaint old Parkinson, in his "Paradisi in sole Paradisus Terrestris," published in 1629, describes six sorts as being grown in his day. He says, "The great Apricocke, which some call the long Apricocke, is the greatest and fairest of all the rest." Of this he gives an illustration. Philip Miller, in his "Gardener's Dictionary" of 1731, describes eight varieties as grown at that period. These were the Masculine, Orange, Algiers, Roman, Turkey, Transparent, Breda, and Brussels. Some of these sorts are still cultivated and enumerated in nursery lists—as, for example, the Breda, Roman, and Turkey.

It was not, perhaps, till the last century that the Apricot began to be generally grown. Then it seems to have become very popular, even cottagers growing it largely on their house walls. The great drawback, however, to the cultivation of the Apricot in our climate is its early-flowering character. Blooming, as it does, in March,

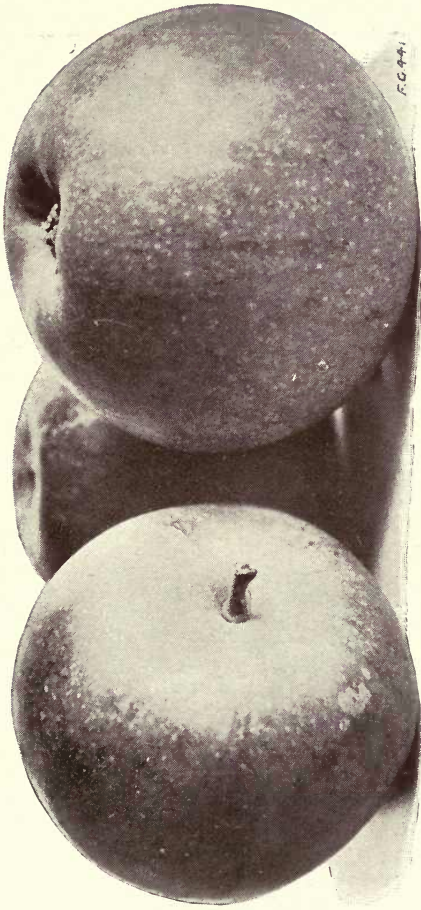
its flowers are so apt to be injured by frost unless the trees are afforded some protection. Still, the fruit is luscious, not only for eating in a ripe condition, but also for preserving whole or making into jam.

Propagation.—The Apricot may be reared from seed or increased by budding in July upon either the Brussels Apricot, the Mussel, Damask, or St. Julien Plum stocks. Apricots come fairly true from seed. The stones should be taken from the best-formed and fully ripe fruits, and buried in soil until February, then plant them about 2in. deep and 8in. apart in sandy soil in a south border. In autumn cover the bed with 6in. of litter as a protection from frost. After the seedlings have made one year's growth, lift and shorten the tap-roots, and then replant 3ft. apart against a west or a south-west wall, and train them as advised in the chapter on "Pruning and Training" elsewhere.

As regards the stocks for budding, the Brussels Apricot is the best for trees that are required to cover a large space, and the Mussel and St. Julien Plum for smaller sized trees. The buds should be inserted in the main stem of the stock, fairly close to the ground.

Soil.—The ideal soil for Apricots is a good friable loam and a well-drained subsoil. Heavy, damp soils are quite unsuitable. Very light, sandy soils, again, do not suit the Apricot. In the latter case add some heavy loam to make the soil more compact. It is advisable in all cases to mix some old mortar with the soil, as Apricots, like all stone fruits, love lime. No manures should be mixed with the soil for planting; these are best applied when the tree comes into bearing.

Aspect.—Experience has demonstrated the fact that Apricots succeed best on east walls in the South of England; south walls in the Midlands; and south-east in the Northern Counties. Apricots cannot be relied upon to ripen their crops in the open in Scotland. In the extreme



5044

DESSERT APPLE, COX'S ORANGE PIPPIN.
Season : November to February.



DESSERT APPLE, BLENHEIM ORANGE.
Season : November to February.

South Apricots are sometimes grown as standards in the open, but the trees are very unreliable in cropping.

Sites.—The site for each tree must be properly prepared before planting. Dig out holes 2ft. deep, and if the subsoil is inclined to be damp put in 6in. of broken bricks and old mortar, and ram this down tightly. If the subsoil is well drained no drainage need be added; simply mix old mortar or small chalk nodules with the soil, and refill to within 6in. of the surface. Tread down firmly. Each site should be prepared thus, 2ft. deep, 4 to 6ft. long, and the same in width.

Forms of Tree.—Apricots are grown in three forms—dwarf fan-trained, tall fan-trained, and cordons. The first form is suitable for walls 8 to 12ft. high; the second for those 12 to 14ft.; the third for those 5 to 7ft. or 8ft. high. The dwarf trees have main stems about 6in. to 9in. high, and branches radiating therefrom. The tall trees, called standards or riders, have main stems 3 to 5ft. high, with branches at the apex. Cordons consist of a single stem furnished with spurs and no branches.

Distance to Plant.—Dwarf trees should be planted 25ft. apart. Between every two dwarf trees a tall standard tree may be planted, the object being to cover the wall quickly. The space between the dwarfs may be utilised by planting cordons 2ft. apart, or they may be planted by themselves.

When to Plant.—From the middle of September to the end of November is the best time to plant Apricots.

Planting.—When the trees arrive from the nursery examine the roots, and cut off any bruised portions. Should they have become dry in transit, immerse them in water for a few hours. In planting spread out the roots evenly, and slightly cover them with fine soil; give the tree a shake to settle the soil; then add more soil and tread it down firmly, finally filling the hole and mak-

ing the surface firm. The upper roots should not be buried deeper than 3 in., and the soil be made firm. Loosely secure the branches to the wall, and mulch the soil with rotten manure.

Mode of Bearing.—The Apricot bears its fruit on shoots of the preceding year's growth; also on spurs on the older growths. To ensure fruit, however, being borne on the last year's growths, they must be well ripened or wood buds only will be the result. (See Fig. 14, p. 43.)

Summer Pruning.—This is more important than winter pruning, and upon the success with which it is carried out will depend the future bearing condition of the tree.

The first step in summer pruning is technically called "disbudding," and means the removal of superfluous shoots. Thus, for instance, any young shoots a couple of inches long or less which grow out of the front of the branches, and are called "foreright shoots," are of no service to the tree, and these must be pulled off with the finger and thumb. Then, on the sides of the branches, any young shoots which have a weakly appearance, or are likely to overcrowd promising stronger ones, should be similarly removed. Later on, the young shoots retained will have to be carefully examined. Select the strongest of these to form future branches, and lay them in between the older growths, fixing them in position by means of a twig rather than nailing them to the wall. Those not so promising should have their points removed at the fourth leaf, and any subsequent growths from these shortened to one leaf to form fruiting spurs.

Those shoots laid in must not be shortened. It is important to bear in mind that the latter should not be reserved at lesser intervals than a foot apart, otherwise overcrowding would result. Sometimes very strong, gross shoots will develop, in which case remove these entirely, retaining only the sturdier growths. In the case of cordons, all young shoots, except the leading one, should be shortened to the fourth leaf to form fruiting spurs.

Winter Pruning.—This requires considerable judgment. In the first place, a judicious thinning out of the older growths should be done. First of all, cut away all weak or exhausted wood; then remove the two-year-old wood to the base of the young growths, so as to give the latter more room, as it is essential that the shoots laid in during the summer should not be over-



Fig. 14. APRICOT SHOOTS.

The left-hand shoot is freely furnished with fruit buds, while the right-hand one has wood buds only.

crowded. The terminal shoots of branches, too, may often be removed with advantage to the nearest young growth, in order to keep the tree compact. Besides, this thinning out of older growths encourages the tree to put forth a succession of new shoots annually, and the tree is consequently kept in a healthier bearing condition. The shoots that were laid during summer must next be shortened. Those two or more feet long shorten one-fourth; those only a foot long cut back half way. The spurs,

too, often need a little thinning out, removing the central portions. Those young growths that were pinched back to three or four leaves shorten about an inch.

Thinning the Fruit.—As soon as the young fruit has attained the size of walnuts, thin them out to 3in. apart; otherwise the crop will be puny in size and wanting in flavour. If the fruit appears in thick clusters, it is well to thin them out earlier, removing the smaller ones by degrees.

Protecting the Blossoms.—Early in March two or three thicknesses of fish-netting should be fixed to the top of the wall, and allowed to hang down over slightly slanting poles, to break the force of cold winds and keep off severe frost. This may be left on permanently till warmer weather arrives. Or a sheet of tiffany may be fixed in the same way, and allowed to remain at night and during cold, windy, or frosty days. Glass copings are sometimes used, but they are expensive.

General Details.—From May onwards, till the fruit has ripened, copious supplies of water must be given in hot, dry weather. Mere sprinklings are useless. A thick mulch of rotten manure should also be spread on the surface of the soil to keep it cool and moist. Spraying the foliage with water, except when the fruit is ripening, on the evenings of hot days is also beneficial. The roots may also be fed with fertilisers, as advised in the chapter on "Manures." Always gather the fruit early in the morning, whilst the dew is upon it, to have it in its best perfection.

Pests.—The chief pest is the larva of the Apricot Moth. Wasps and flies are also fond of the fruit.

Diseases.—The Apricot Brown Rot attacks the fruit, and Gummosis the branches. Canker, Mildew, and another unnamed disease often cause the branches to die suddenly. See chapter on "Diseases," further on.

Varieties.

Following are the leading kinds in cultivation:

Breda.—A hardy variety, which may be grown as a standard in the open in the South of England. Size, small. Shape, roundish. Colour, orange on shady side, reddish-orange with brown dots on sunny side. Flavour, very rich and juicy. Season, early August.

Early Moorpark.—An early and good variety. Size, medium. Shape, roundish. Colour, yellow, mottled with crimson. Flavour, juicy and rich. Season, mid-August.

Frogmore Early.—Very early sort. Size, small. Shape, roundish. Colour, yellow, blotched with crimson. Flavour, melting, juicy, and rich. Season, July.

Hemskirk.—A hardy variety. Size, large. Shape, round. Colour, yellow and red. Flavour, juicy and rich. Season, mid-August. Heavy cropper.

Kaisha.—A good bearer of moderate growth. Size, medium. Shape, roundish. Colour, pale citron, marbled red on sunny side. Flavour, most delicious and sugary. Season, mid-August.

Large Early.—A variety not subject to gumming. Size, large. Shape, oblong. Colour, pale orange, spotted red. Flavour, rich and juicy. Season, early August.

Large Red.—A very hardy and free-bearing variety. Size, large. Shape, oval. Colour, deep orange-red. Flavour, rich and juicy. Season, early September.

Moorpark.—A variety of great excellence, but liable to have its branches suddenly wither and die. Size, large. Shape, roundish. Colour, orange-yellow, brownish-red on sunny side. Flavour, superb, very juicy, and rich. Season, early September.

New Large Early.—An improvement on Large Early. Size, large. Shape, oval. Colour, yellow, flushed red, and spotted crimson. Flavour, very rich. Season, early August.

Oullin's Early.—A healthy, free-bearing variety. Size, large. Shape, oval. Colour, yellow, tinged with red. Flavour, deliciously rich and juicy. Season, early August.

Peach.—An old and very fine variety. One of the best. Size, large. Shape, oval. Colour, yellow, with a reddish tinge on sunny side. Flavour, juicy, rich, and highly perfumed. Season, early September.

Powell's Late.—A fine hardy late variety. Good cropper. Size, medium. Shape, roundish. Colour, yellow to orange. Flavour, very juicy and rich. Season, mid-September.

Shipley's.—A good variety for preserving. Hardy and a free bearer. Size, large. Shape, oval. Colour, deep yellow. Flavour, juicy. Season, early August.

St. Ambrose.—A hardy, free-bearing variety. Size, large. Shape, roundish. Colour, yellow, reddish next the sun. Flavour, juicy, rich, and sugary. Season, mid-August. The most prolific variety grown.

CHAPTER III

The Barberry.

THE COMMON BARBERRY (*Berberis vulgaris*) is a deciduous shrub, growing 8ft. to 10ft. high, and exists in a wild state in this country, as well as in other parts of Europe and in North America. It is now grown chiefly in gardens as a flowering shrub.

The flowers are yellow, borne in pendant racemes in spring, and the stamens possess the peculiar property of striking themselves against the pistil when touched. The flowers are succeeded by oblong, narrow berries, which when ripe are of a brilliant scarlet hue. They ripen in the autumn. The berries are too acid to eat in a raw state, but when made into a jelly they make a most delicious preserve. The green berries, too, may be pickled in vinegar, and in this form make an excellent appetiser for use with cold meats.

Culture.—One or two bushes grown in the shrubbery or in any odd corner will give an ample supply of berries. Ordinary soil will suffice. Plant in autumn or winter. The shrub is easily increased by seeds sown when ripe in the open ground, or by suckers or division of the roots in autumn. To ensure plenty of fruit, grow the shrub with a single main stem, and keep all suckers removed; also prune back any straggly branches in winter.

Varieties.—The best kind for general cultivation is the Common Barberry. There is a stoneless or seedless form of it, but this only occurs in the case of old plants.

CHAPTER IV.

The Bilberry.

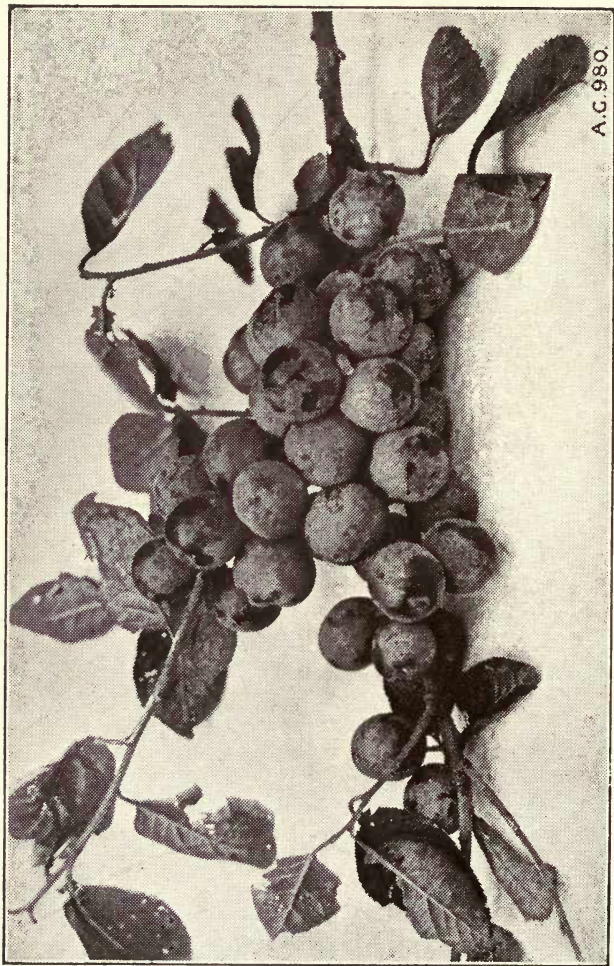
THE BILBERRY, Blaeberry, or Whortleberry (*Vaccinium myrtillus*) is a native deciduous shrub, growing only 1ft. to 2ft. high, in peaty woods, and on heaths in various parts of the country, particularly in the North. In days gone by the purplish berries found a ready market in our large towns, especially London, and were highly esteemed when cooked in tarts, eaten with cream, or made into jelly. The flowers are small, urn-shaped, and pinkish in colour, and the berries purplish when ripe, and about the size of a black currant berry.

The Cowberry (*Vaccinium Vitis-Idæa*) is a near relative, and is a low evergreen shrubby plant bearing red berries. It is common in peaty woods and on heaths. Large quantities of this fruit used to be imported in water from Sweden and sold as cranberries.

Culture.—Although a wild plant, the Bilberry may be easily grown in a mixture of peat and leaf-mould in a bed in a sunny position. Plant in autumn 2ft. apart each way. They require no special attention beyond keeping the plants free from weeds. Increased by layering the shoots in summer.



DESSERT APPLE PEASGOOD'S NONSUCH.
Season : November to New Year.



DAMSON, FARLEIGH PROLIFIC OR CLUSTER.
Season : September.

CHAPTER V.

The Blackberry.

THE COMMON BLACKBERRY or Bramble (*Rubus fruticosus*) of our hedgerows is well known. Everyone knows how fruitful these plants are in a wild state; and many, no doubt, have observed their great variation in habit and growth. But good as they are, it is not worth while attempting their culture in gardens when fruit can be so plentifully obtained in a wild state.

Some years ago several kinds were introduced from America that were reputed to be worth growing in gardens, and that were far superior in every way to the wild kinds. These, however, have signally failed to justify such high expectations. The only kind worth growing in gardens is the Parsley-leaved Bramble, a seedling variety raised from *Rubus laciniatus* (Cut-leaved Bramble). This has handsome foliage and richly-coloured stems, and also bears large berries in profusion. There is also a hybrid between the Blackberry and the Raspberry, called the "Mahdi." It is similar in growth to the Blackberry, and bears nearly black raspberry-like fruits, which are of sweet flavour. The plant is a prolific bearer, and requires similar culture to the Blackberry.

Culture.—The Parsley-leaved Bramble will thrive in any good ordinary soil. Heavy, damp soils are not suitable. Light or poor soils should be liberally enriched with manure before planting. It is advisable to trench the soil 2ft. deep at least. Blackberries prefer an open, sunny position, sheltered from cold winds. The plants may be grown singly over an arch, or against a fence facing east, or in a row in the open garden, placing the plants 5 to 6ft. apart, and training half the shoots one way and half the

other to a rough trellis work. If more than one row be desired, then the rows should be 9ft. apart. Plant in early autumn.

Pruning.—The Blackberry requires, in this respect, to be treated like the Raspberry—i.e., when first planted, to have its shoots cut off close to the ground. Thus no fruit is borne the first year. The following autumn cut back close to the ground again all weak shoots, and retain the strongest only, which shorten to 3 or 4ft. The next season there should be plenty of vigorous growth and fruit. About July cut away any weak new growths. Later on, when the plants have finished fruiting, cut away those shoots that have borne fruit, and leave those of the current year to bear fruit the following season. Shorten these in autumn to 5, 6, or 8ft., according to their vigour, and train them to the trellis. Follow this rule in subsequent years. Should any laterals form, pinch these back to the third leaf.

Feeding.—When established and in full bearing Blackberries will be greatly benefited by frequent supplies of liquid manure from cesspools, house slops, or drainings from the stable. Heavy mulchings of manure will also be beneficial.

Propagation.—The best way to propagate the Blackberry is by rooting the tips of the strong shoots in the following manner. Remove the point of a strong young shoot when 2 to 3ft. high. In due course laterals will form, and when these are 6in. long, bend the shoot down to the soil and peg each lateral firmly on it. Each lateral will then emit roots in about six to eight weeks, and it can then be severed and planted elsewhere. Even strong shoots, if their tips are bent down to the soil and secured there, will root in a month or so, and form tiny plants.

CHAPTER VI.

The Bullace and Damson.

THE BULLACE AND DAMSON belong to the Plum family, but they possess sufficient distinctive characteristics to be treated in a separate chapter. The Common Bullace (*Prunus insititia*) is a native tree, but is not very common in a wild state. It forms a medium-sized tree, and bears small roundish, yellow-green or white fruits, which are excellent for tarts. As a rule, Bullaces are free croppers, and well suited for planting in hedgerows. The Bullace must not be confounded with the Sloe, or Blackthorn (*Prunus spinosa*). This grows in bush form in hedges, etc., and has its branches covered with spines.

The Damson derives its name from Damascus, where the fruit was grown before the Christian era under the name of "Damascenes." It seems to have been introduced from thence into Italy about 114 B.C. When they were introduced into this country we are unable to say. The earliest reference to Damsons we can find is in Parkinson's "Paradisi in Sole, Paradisus Terrestris," published in 1629. There he mentions two or more varieties. The Damson was formerly cultivated very largely in cottage gardens in Shropshire, Cheshire, Worcester, and Hereford, and we have known individual trees to yield fruit of the value of £5 in one season. High prices were realised for the fruit forty years ago, it being in great demand for yielding liquor for dyeing purposes. The latter having been superseded by chemical substitutes, there is nowadays less demand for the fruit, its chief use being for bottling and preserving. Many people also make an excellent wine from the ripe fruit.

Propagation.—Both the Bullace and the Damson are propagated by seed and by suckers. The seeds, or stones,

are taken from perfectly ripe fruit, and buried between layers of sand outdoors. They are left thus till the following spring, then sown 3in. deep and 6in. apart in rows 2ft. asunder early in March in the open garden. In the autumn of the second year lift and replant the seedlings 2ft. apart in rows 3ft. asunder, and let them remain for two years, then plant out permanently. Suckers are shoots



Fig. 15. DAMSON SHOOTS.

Right-hand shoot, one year's growth and carrying wood buds only.
Left-hand shoot, two years old and furnished with fruit buds.

that spring from the roots. These, lifted in the autumn and planted in nursery beds, will in time make nice trees, but the great drawback to Damsons reared thus is their natural tendency to produce further suckers from their roots, and thus prove a nuisance. The amateur, however, is strongly advised to purchase ready-trained trees from a nursery rather than attempt to rear them at home.

Soil and Situation.—A somewhat moist loam or medium clay will suit the Damson. As a rule, however, it will succeed on most soils that are not too dry and light. The Bullace, like the Plum, does best in a good loam which is well drained. Calcareous or chalky soils also suit the growth of the Bullace. Damsons are hardier than the Bullaces, and may be grown in hedgerows or exposed positions. The Bullace requires a more sheltered situation.

Forms of Trees.—Both may be grown as standards, half-standards, and pyramids. The two former are suitable for orchard culture or large gardens, and the pyramids for small gardens. The former should be planted 18 to 20ft., and the latter 10ft. apart.

Planting.—Do this in autumn, as soon as the leaves fall. Keep the upper roots fairly close to the surface, as they do not descend very deeply into the soil. After planting mulch liberally with manure. Standard trees should be firmly staked at planting time, as, owing to shallow planting, they would be liable to injury by strong winds. Pyramid trees should be lifted and replanted every three or four years to check exuberant growth and cause them to be fruitful.

Pruning.—Standard trees require no pruning beyond an occasional thinning out of overcrowded branches. Pyramids should be summer and winter pruned, in the manner advised for Plums, which see.

Pests and Diseases.—See chapter on the “Plum.”

Varieties of Bullaces.

The following are good sorts:

Black.—A late variety. Fruit small. Shape, round. Colour, black, covered with a white bloom. Flavour, somewhat austere. Should not be gathered till subject to early frosts. A favourite Essex variety.

Royal Bullace.—A remarkably free bearer. Fruit large. Shape, round. Colour, yellowish-green, covered with a greyish bloom. Flavour, brisk. Ripens in October. Grand for pyramids or standards.

Shepherd's.—Good sort for tarts or preserving. Fruit, large. Shape, round. Flavour, good. Colour, greenish. Ripe in October.

Veitch's Langley Black.—A new variety, and a great bearer. Fruit, medium-sized. Shape, round. Colour, black. Flavour, rich. Good for pyramids. Ripe in November.

White Bullace.—An immense bearer. Fruit, small. Shape, round. Colour, yellowish-white. Flavour, sweet. Ripe in October and November.

Varieties of Damsons.

Following are the best kinds of damsons:

Blue Prolific.—A free cropper. Fruit, medium-sized. Shape, roundish-oval. Colour, purple. Flavour, juicy and rich. Ripe early September. Good for pyramids or half-standards.

Bradley's King.—The best of the Damsons. A profuse bearer. Excellent for standards. Fruit, large. Shape, oval. Colour, deep purple. Flavour, delicious and sweet. Suitable for dessert or cooking. Ripe, end of September.

Farleigh Prolific, or Crittenden.—A most prolific cropper, bearing its fruit in clusters. Largely grown for market purposes. Fruit, medium-sized. Shape, roundish-oval. Colour, black. Flavour, juicy and rich. Ripe, September. Suitable for standards.

Rivers' Early.—A very early variety, ripening in August. Fruit, medium-sized. Shape, oval. Colour, black. Flavour, excellent. Ripe, August. Suitable for pyramids or standards.

Shropshire Prune.—A large-fruited Damson, much grown in Shropshire, Cheshire, Worcester, and Hereford. Fruit, very large. Shape, oval. Colour, black. Flavour, juicy and rich. Suitable for standards. Ripe, October.

The Merryweather.—A very fine Damson, and a sure and heavy bearer. Fruit, very large. Colour, black. Flavour, delicious. Trees begin to bear when three years old. Suitable for pyramids or standards.

CHAPTER VII.

The Cherry.

"THIS beautiful fruit," says Phillips in his "History of Fruits," "was procured and brought into Europe by the overthrow of Mithridates, King of Pontus, when he was driven from his dominions by Lucullus, the Roman general, who found the cherry-tree growing in Cerasus, a city of Pontus (now called Keresoun, a maritime town belonging to the Turks in Asia), which his army destroyed, and from whence it derived the present name of Cherry." The date, therefore, of its introduction into Europe would be about 67 B.C.

According to Pliny, the Roman naturalist, the Cherry was introduced into Britain in 42 B.C. Other authorities state that the date of its introduction here was in the reign of Nero—A.D. 55. Eight varieties of Cherries were known to Pliny early in the Christian era, so that the Romans were evidently well acquainted with the fruit. Cherries were hawked about the streets as early as 1415; they were mentioned in a list of fruits in the reign of Henry VII., and Parkinson, a writer early in the seventeenth century, alludes to the fact of thirty-six varieties being grown in his time.

Cherry orchards existed in Kent in the sixteenth century, since it is recorded that one orchard realised the sum of £1,000. It is therefore evident that Cherries have been extensively grown in England for some centuries.

Propagation.—The Cherry is usually increased by seed in the case of rearing new varieties only; by budding in June and July; or by whip grafting in late March or early April. Grafting, however, is not so generally practised as budding, which is a much more successful and easy method than the former in the case of all stone fruits. See chapter on "Propagation" for details.



SWEET CHERRY, GOVERNOR WOOD,
Season: Early July.

A.G. 1031 A



CULINARY CHERRY, THE MORELLO.
Season : August to October.

Stocks.—The principal stock is the Wild Cherry, or Gean (*Prunus avium*). As, however, some varieties do not succeed so well on this stock as others, the Common Cherry (*Prunus Caproniana*), a native of Europe; and the Mahaleb Cherry (*Prunus Mahaleb*), a dwarf South European species, are also used as stocks for cultivated Cherries. It appears that the Heart and Bigarreau sorts do best on the Wild Cherry; the Duke and Kentish ones on the Common Cherry; while the Mahaleb, which is a more fibrous and shallow-rooting stock than the others, answers best for such sorts as Governor Wood, May Duke, Late Duke, Early Rivers, Black Eagle, and Royal Duke for culture on sandy subsoils. All have to be reared from seed, as advised in the chapter on "Propagation" in Part II.

Forms of Trees.—Cherry trees are grown as standards, with stems 6ft. high, and branches at top; half-standards, with stems 3ft. high; dwarf fan-trained trees, with stems 6in. high; tall standard fan-trained trees, or riders, with stems about 7ft. high; pyramids, with a short main stem from which side branches radiate in the form of a cone; and cordons with single stems furnished with spurs and no branches. Standards and half-standards are suitable for orchard culture; pyramids for garden culture; dwarf and tall fan-trained for lofty walls; and cordons for low walls, fences, or trellises in the open garden.

Soil.—The Cherry requires a deep, well-drained soil. Heavy clays and light soils overlying gravel or chalk are quite unsuitable. A good rich loam is the ideal soil for Cherries. In gardens, therefore, that are situated on heavy clay, or light soils over gravel or chalk, it will be necessary to prepare special sites for the trees, if it is intended to grow Cherries successfully. Clay soils must be drained, dug deeply, and have plenty of old mortar or grit freely mixed with them to render them porous. In the case of gravelly or chalky soils, dig out holes 4ft.

deep and 6 to 8ft., or even 10ft. wide, for pyramid or wall trees. Such holes must be filled with good turfy loam, plentifully mixed with old mortar, or a little lime. No manure should be added.

Aspect.—Standard and pyramid trees succeed best in an open position on land sloping southwards. Fan-trained and cordon trees may be grown on east, west, or south walls. Of the three aspects the south is the best for early sorts, and the east and west for the later ones. Morellos do best on north walls. Cordons may also be grown against low fences; also on arches or trellises in the open garden. Standard trees are not recommended for garden culture, only for orchards where the soil is of a good loamy nature.

Distances to Plant.—Cordons should be planted 18in. to 2ft., pyramids 12ft., fan-trained trees 15 to 20ft., and standards 30ft. apart.

Planting.—The best time to plant is as soon as the leaves have fallen—i.e., from the end of October to the end of November. See that bruised ends of roots are cut off, and that the roots are moist before planting. Spread out the roots evenly and to their full length in the holes, and cover them with fine soil. Give the tree a gentle shake to settle the soil about the roots; then add more soil, and tread this down firmly. Add more soil, and again tread; and so on, until the hole is filled. The roots should be not deeper than 6in. The best guide to depth, however, is the soil mark, or stain on the trunk showing the depth the trees were in the ground when growing in the nursery. Pyramids or standards should have a stout stake fixed to each tree at the time of planting, and the stem firmly secured to this. In the case of heavy soils it is well to use some lighter mould for covering the roots, thus encouraging young roots to form more quickly. Finish off with a mulching of rotten manure.

Mode of Bearing.—The Cherry produces its fruit on spurs on the older wood; also on buds formed at the



Fig. 16. SUMMER PRUNING SWEET CHERRIES.

(a) Fruiting spurs. (b) Shoots which require to be shortened to the fourth leaf. (c) Point at which to prune in winter. (d) and (e) Fruiting spurs. (f) Lateral growths, summer pruned and cut back to two buds in winter. (g) Leading shoot which must not be summer pruned.

base or along the greater part of the shoots of the previous year's growth. In the case of the Morello, in fact,

fruit buds are formed plentifully along the last year's growth, the terminal one often being the only wood bud. The same remarks apply to standard trees that are not pruned. A spur is a cluster of fruit and leaf buds, and may be readily distinguished by its whorl of leaves and the absence of shoots.

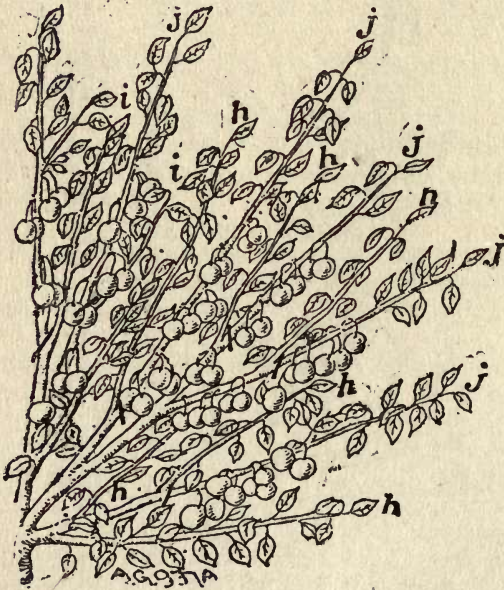


Fig. 17. SUMMER PRUNING MORELLO CHERRIES.

(*i*) Shoots reserved and laid in on the upper side of the branches. (*h*) Shoots laid in on the underside, the wrong way. (*j*) Leading shoots, which must not be summer pruned. Bars indicate where to prune in winter.

Summer Pruning.—This is usually practised only in the case of trained trees—i.e., pyramids, fan-trained, and cordons. It would be difficult to summer prune tall standards, at any rate, when they attain a large size. In their younger stage a little judicious summer pruning is bene-

ficial for ensuring well-balanced growth and fruitfulness. Summer pruning is best done in July and August. (Fig. 16.) The young lateral shoots on fan-trained trees—i.e., those growing at the sides of the branches, should then be shortened to the fourth or fifth leaf, say about 3in. from their base. The leading shoots at the ends of the branches must not be shortened, but allowed to grow their full length. It will probably happen that the shoots which were shortened will produce further shoots, in which case shorten them to one leaf. Shoots that grow out of the front of branches should be rubbed or pulled off in May; this is termed disbudding. The Morello, as already explained, bears its fruit along the whole length of the previous year's shoots. These, therefore, must not be summer pruned, but nailed or otherwise secured to the wall. If a Morello promises to make too many young growths, it is advisable to disbud the weakest early in May. (Fig. 17.) Cordon trees simply need to have all side shoots shortened as advised, and the leader left untouched. Pyramids require their lateral shoots to be shortened to three leaves, and the leaders to eight or twelve leaves, according to their vigour. Subsequent growths resulting from these, shorten to two leaves.

Winter Pruning.—This is a simple business, and consists of cutting back any leading shoots to a wood bud where it is necessary to do so to improve the contour of a pyramid tree; or laterals so that new shoots may be induced to form next year. Fan-trained and cordon trees need no winter pruning if the summer pruning has been properly carried out. In older trees, much crowded with old spurs, the latter may with advantage be thinned out. The Morello, too, needs a certain amount of winter pruning. For instance, those shoots that have borne fruit during the summer should be cut right out, leaving the young growths to take their place. This should be done in October or November. In the case of standard trees prune the first and second year's shoots to 18in. from their base,

with a view to encouraging about six main branches to develop. Any laterals which may develop shorten to about three inches. In subsequent years the only pruning required will be the removal of branches which show a ten-

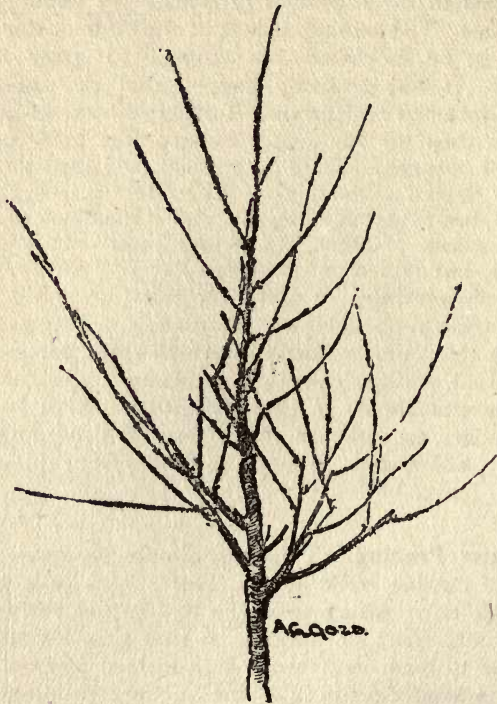


Fig. 18. A PYRAMIDAL CHERRY TREE BEFORE PRUNING.

The succeeding illustration (Fig. 19) shows the amount of winter pruning required. Cherries are also grown as fan-trained, standard and cordon trees.

dency to overlap, or to crowd the centres of the trees. If a tree is predisposed to form too many laterals during the first few years, it is advisable to disbud the superfluous growths in early spring. (Figs. 18 and 19.)

Lifting and Root Pruning.—Pyramids and wall trees that are inclined to make too much wood should be lifted and root-pruned in October. This will check a too luxuriant growth, and make the trees more fruitful. See chapter on "Pruning" further on.

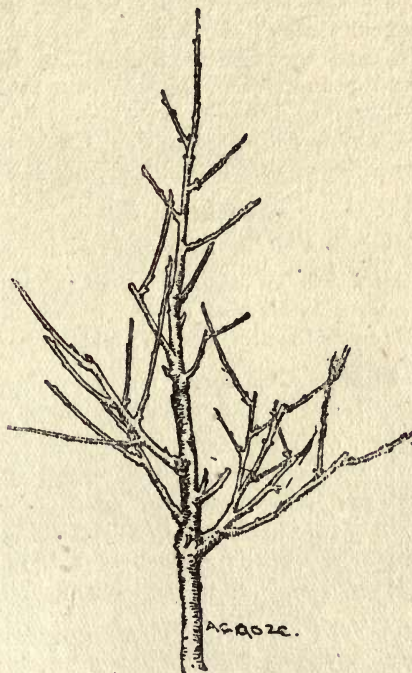


Fig. 19. A PYRAMIDAL CHERRY TREE AFTER PRUNING.

Showing how to shorten the shoots in winter so as to maintain the tree in perfect shape.

General Details.—Trees grown against walls should, when in blossom, be protected with fish-netting, as advised for Apricots. In dry seasons wall-grown trees should be given copious supplies of water, with occasional

applications of liquid manure. Heavy mulchings of manure, too, will be beneficial for keeping the soil moist and cool. Cherries are very apt to cast their fruit if the roots become dry.

Pests.—The chief insect pests attacking the foliage of the Cherry are the larvæ of the Winter, Lackey, and Mottled Umber Moths; the Cherry Slugworm, Cherry Black Aphis, and the Cherry Bug. The Cherry Fruit Moth attacks the fruit. See chapter on "Pests" further on.

Diseases.—These are the Cherry Leaf Scorch, Leaf Spot, Cherry Mildew, Cherry Leaf Blight, and Gummosis.

Varieties.

Following is a list of the best Cherries in cultivation:

Archduke.—A fine-flavoured Cherry suitable for walls or cordons. Size, medium to large. Form, heart-shaped. Colour, dark red or black. Season, mid-July. Self-fertile.

Bedford Prolific.—A very free-growing and free-bearing sort. Good for standards or high walls. Size, large. Form, heart-shaped. Colour, black. Season, early July. Flavour, good. Self-fertile.

Belle d'Orleans.—Good grower and free bearer. Suitable for standards or high walls. Size, medium to large. Form, roundish. Colour, yellowish-white. Flavour, juicy and rich. Season, mid-June. Self-fertile.

Bigarreau.—Very hardy, strong grower, and free bearer. Good orchard tree. Size, very large. Form, heart-shaped. Flavour, delicious. Colour, pale yellow, marbled red. Season, end of July. Self-sterile.

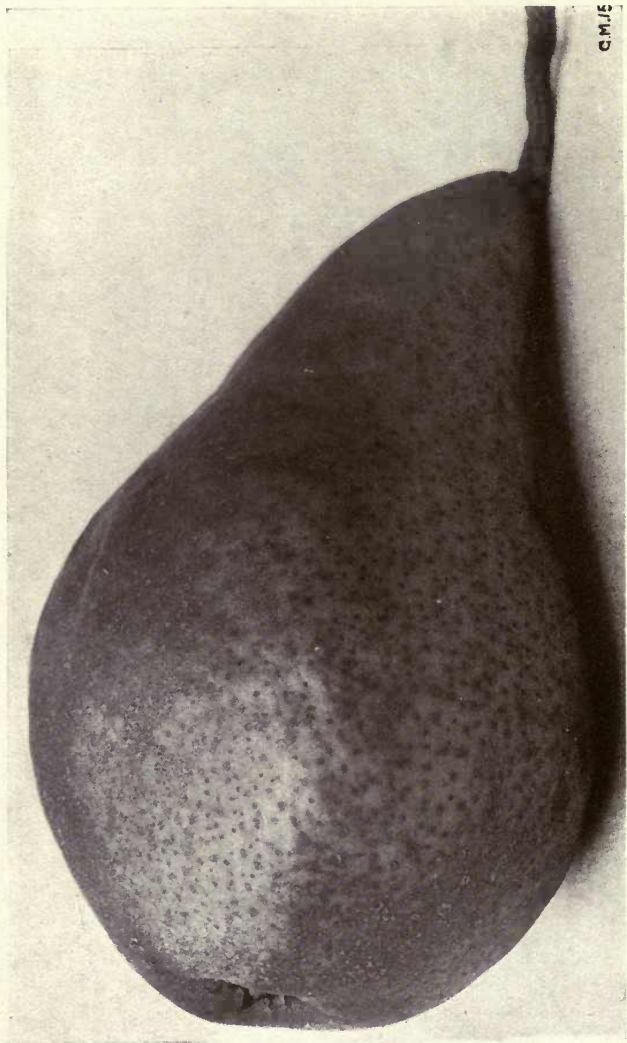
Bigarreau de Schreken.—A splendid Cherry for a south wall. Size, large. Form, roundish. Colour, jet black. Flavour, juicy, rich. Season, end of June. Self-sterile.

Bigarreau Napoleon.—A thoroughly hardy, free-growing, and free-bearing Cherry. Splendid for orchards or



SWEET CHERRY, BIGARREAU.
Season : End of July.

A.G. 1031.



C.M.15

PEAR, DURONDEAU.
Season: October and November.

lofty walls. Size, very large. Form, heart-shaped. Colour, yellow, mottled with red. Flavour, juicy and most delicious. Season, early August. Self-sterile.

Black Eagle.—A first-rate Cherry to grow as a pyramid, cordon, standard, or wall tree. Free bearer. Size, medium to large. Form, roundish to heart-shaped. Colour, black. Flavour, rich. Season, early July. Self-sterile.

Black Tartarian.—A good Cherry for a south wall; does well as a cordon. Size, very large. Form, heart-shaped. Colour, black. Flavour, juicy and rich. Abundant bearer. Season, early July. Self-sterile.

Early Rivers.—A hardy, free-bearing Cherry, adapted for walls, pyramids, cordons, or standards. Size, large. Form, heart-shaped. Colour, black. Season, middle of June. Self-sterile.

Florence.—An excellent late Cherry. Good for walls, particularly to grow as cordons. Size, very large. Form, heart-shaped. Colour, bright red. Flavour, juicy, sweet, rich, and delicious. Season, mid-August. Self-sterile.

Frogmore Early Bigarreau.—Good Cherry to grow as pyramids or on walls. Size, large. Form, heart-shaped. Colour, yellow, marbled with red. Flavour, juicy, sweet, and rich. Season, early July. Self-fertile.

Governor Wood.—Splendid sort for pyramids, cordons, or walls. Free grower and free bearer. Size, large. Form, heart-shaped. Colour, yellow, mottled light red. Flavour, juicy and rich. Season, early July. Self-sterile.

Kentish.—A popular culinary variety, much grown in Kentish orchards. Good for jam-making. May be grown as a pyramid or standard. Size, medium. Form, round. Colour, red. Flavour, juicy and acid. Season, end of July. May be grown on a north wall. Self-fertile.

Knight's Early Black.—Does well as a standard in orchards or as a cordon or fan against walls. Size, large. Form, heart-shaped. Colour, purplish-black. Flavour, juicy and rich. Season, early June. Self-fertile.

Late Duke.—A good Cherry to grow as a standard or on walls. Size, large. Form, roundish. Colour, amber. Flavour, rich, slightly acid. Season, August. Self-fertile.

May Duke.—Good Cherry to grow as a pyramid, or as a fan or cordon against walls. Size, large. Form, roundish. Colour, red. Flavour, juicy and rich. Season, July. Good bearer. Self-fertile.

Morello.—The best of all Cherries for tarts or bottling. Does well as a pyramid or standard; also excellent for a lofty north wall. Size, large. Form, heart-shaped. Colour, purplish. Flavour, juicy and acid. Season, August to October. Self-fertile.

Royal Duke.—A fine late Cherry. Free bearer. Suitable for pyramids, cordons, or fans. Size, large. Form, roundish. Colour, dark red. Flavour, juicy and very rich. Season, end of July. Self-fertile.

Reine Hortense.—A very productive Cherry, and a free grower. Size, large. Form, roundish. Colour, bright red. Flavour, juicy, sweet, and slightly acid. Season, end of July. Self-fertile.

Selections for Special Purposes.

Cherries for Walls.—To grow as fans or cordons: Belle d'Orleans, Frogmore Early, Early Rivers, Governor Wood, Black Tartarian, May Duke, Royal Duke, Bigarreau de Schrecken, Florence, Archduke, Late Duke, and Black Eagle.

Cherries to Grow as Pyramids.—Early Rivers, Frogmore Early, Governor Wood, May Duke, Late Duke, Archduke, Royal Duke, Reine Hortense, Black Eagle, Bigarreau, Bigarreau Napoleon, and Morello.

Cherries to Grow as Standards.—Belle d'Orleans, Black Eagle, Bigarreau, Bigarreau Napoleon, Florence, Governor Wood, Kentish, Knight's Early Black, May Duke, Reine Hortense and Morello.

CHAPTER VIII.

Cobnuts and Filberts.

COBNUTS AND FILBERTS are varieties of the Common Hazel Nut (*Corylus Avellana*) of our hedgerows and woods. The Filbert derives its name from "full beard," in allusion to the length of its husk. It appears that this nut was introduced from Greece into Italy by the Romans, and the nuts were known there as Avellana Nuts, from the fact of their being largely cultivated at Avelino. From Italy the Filbert apparently found its way into France, and thence into England. The nuts are long and slender, and covered entirely with a fringed husk, which extends beyond the apex of the nut. They were formerly known as "Full-beards."

The Cobnut is said by Phillips to have been first cultivated in this country in 1665, a Mr. John Ray having introduced them from Constantinople. The Barcelona Nut, which is imported extensively into this country from Spain, is almost identical with our Cobnut. The Cobnut has a shorter and rounder nut than the Filbert, and the husk also does not quite cover the nut. Since the first introduction into this country, both the Filbert and the Cobnut have been greatly improved, there now being several varieties of each.

Mode of Bearing.—The male and female flowers are distinct, and borne separately on the shoots. The male blossoms are borne in the form of catkins, or drooping tassels, and appear early in the winter. The female flowers are small and somewhat inconspicuous, and do not appear till February or later. They consist of small plump buds, in the centre of which are borne crimson thread-like styles—the female organs. The tiny flowers are fertilised with the pollen of the catkins, which is con-

veyed to them by the agency of wind or small insects. To ensure nuts forming, therefore, it is essential not to prune away the catkins until it is seen that the female blooms have been fertilised. Female blooms are borne, as a rule, on lateral shoots of the previous year's growth, or on spurs of older growth. (See Fig. 20.)

Propagation.—Both may be reared from seed, the nuts being gathered when quite ripe, removed from their husks,

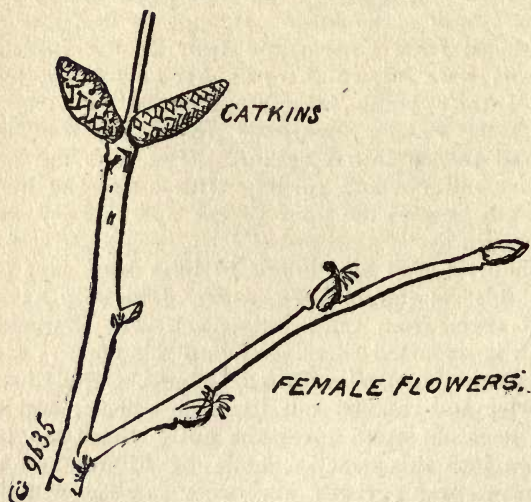


Fig. 20. FLOWERING BRANCH OF FILBERT.

and then placed between layers of moist sand in any cool place. The following March sow the nuts in drills 2in. deep and 1ft. apart in good light soil in the open garden. In the autumn of the following year transplant the seedlings 1ft. apart in rows 2ft. asunder. Leave them thus for two years, then plant out permanently.

Seedlings, however, are not to be relied upon to fruit freely. A much better plan is the Kentish one of lifting

strong suckers from the base of the tree in autumn, and planting these 1ft. apart in rows 2ft. asunder. Each sucker must be furnished with roots, and when planted be shortened to about 1ft. In two years' time these suckers may be planted out permanently.

They may also be increased by layering two-year-old shoots in autumn, severing these from the parent the following autumn, and planting them out as advised for the suckers. Choice sorts may also be whip grafted on seedling plants in March.

Soil and Situation.—Cobnuts and Filberts thrive best on stony, brashy soil, on sloping or hilly land. On such soils the trees make a sturdy, fruitful growth. Heavy, damp, or very rich soils encourage a too rank growth and a paucity of female flowers. So many people fail to get nuts to fruit well because the soil is too rich, too damp, or too heavy. It is useless to plant Cobnuts or Filberts except in well-drained loamy or stony soils. The situation, too, must be an open and sunny one, and sheltered from north or north-east winds.

Planting.—The best time to plant is in October, and the bushes should be placed 10 to 12ft. apart. If the soil be poor, mix some well-rotted manure with it to give the roots a fair share of nourishment when they start to grow. Mulch the surface of the soil also when the planting is finished, and see that each tree is properly staked.

Pruning and Training.—There are two ways of training nuts—one, the rough-and-ready way so often practised, namely, as a bush; and the other, the more profitable method, growing them cup-shaped—i.e., with open centres, a main stem 1ft. high, and six branches. Nuts are also grown as low standards, but this is a method more ornamental than profitable.

The first method does not permit sufficient light and air to get among the branches, consequently the crop of nuts is usually a sparse one, and the nuts individually

are small. Still, assuming such bushes do exist in gardens, the pruning should consist of the removal of all suckers that grow at the base of the bush, and the thinning out of branches that crowd the centre. Do this early in winter.

Further pruning consists of shortening the lateral shoots of the previous year's growth as soon as the tiny crimson



Fig. 21. GROWTH OF COBNUTS.

Showing the kind of shoots which it is essential to obtain to ensure a good crop of nuts.

female flowers can be seen close to the latter. In some cases a female flower will form at the apex of a short sturdy shoot, in which event no shortening should be done. This operation must not be done until the female blooms are fully opened in February or March. Such laterals as are bearing male flowers may be shortened to the first tassel, as soon as it is well formed. Later, when the female flowers have been fertilised, and embryo nuts

have begun to form, again shorten such shoots to the first female bloom, if there should be one on the same shoot; or, if none, then prune the shoot to the second bud from its base to form a spur. Readers will then find their nut bushes will bear more freely. (Figs. 21 and 22.)

Trained Bushes.—The Kentish system of growing Filberts and Cobnuts is to so train the tree or bush that it has a main stem 1ft. high, with six main branches radiat-



Fig. 22. A TYPICAL KENTISH COBNUT BUSH.

Observe the centre of the bush is kept open, the branches spreading well outwards,

ing from its apex. Commencing with an established sucker, all side growths are cut clean away to 18in. from the base. Any lateral growths above this, including the leading shoot, should be pruned back to one bud. If there are no lateral growths, then shorten the main shoot to 18in. The three or four buds will then in due course produce the same number of shoots, of which the three strongest only should be permitted to grow. Each of the three shoots must be cut back the following winter to the fourth bud, and the latter should be one growing

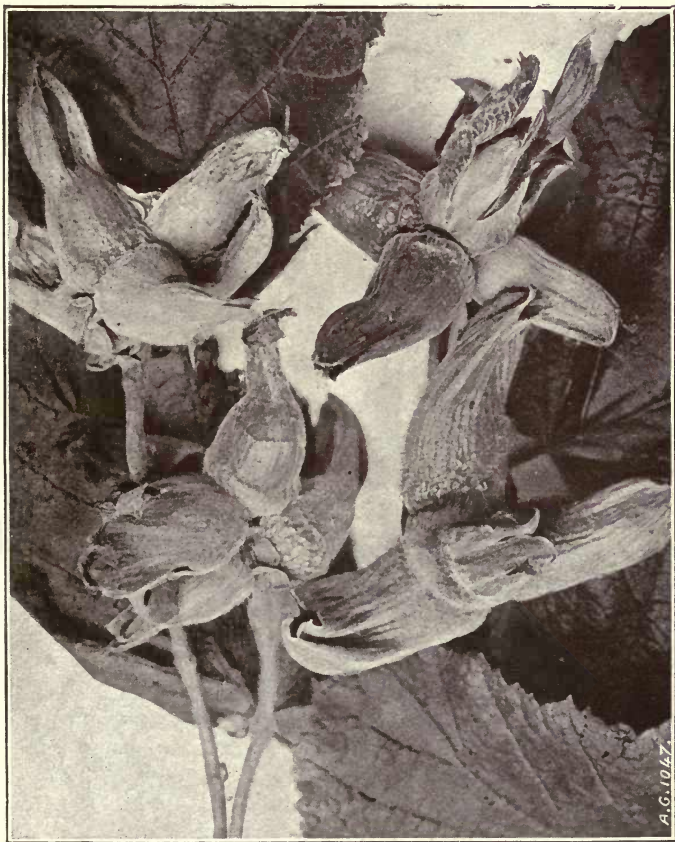
outwards, not inwards. The next season allow two lateral shoots only to develop on each. These will therefore provide the necessary six main shoots required.

A stake should be placed to each shoot so as to train it outwards and at an even distance from its neighbour. In winter shorten these shoots according to their vigour—the nearest, say, two-thirds, and the stronger ones one-third. The next year allow one leader shoot to grow on each branch, and summer prune any laterals that form to four or five leaves. Proceed thus each year until the main branches are 4ft. to 6ft. long, then summer prune the leaders to four leaves. During the summer all lateral growths should have their points snapped off at the fourth or fifth leaf.

Winter pruning consists of shortening each leader to a couple of buds, the laterals to the first male blossom, or, if no male blossom, then to the first female flower. Shoots that bear male flowers only can, after the female flowers are fertilised, be shortened to two buds. Should young lateral shoots form too freely, disbud the weakest in early summer, and if any new growth should be inclined to grow too strongly remove it entirely.

It will now be seen that the nut bush is shaped like a cup or basin, has its centre open, and six branches trained outwards at equal distances apart. Light, sun, and air have easy access to all parts, and the result is a good crop of nuts annually.

General Details.—Trees in full bearing are greatly benefited by copious supplies of liquid manure, also heavy mulchings of stable manure in summer. It is also advisable to dig in some rotten dung annually in winter. When the female flowers are in full blossom, give the trees an occasional shake to distribute the pollen; and, should there be a shortage of male catkins, cut some hazel branches laden with catkins and place these among the trees early in March.



THE RED FILBERT.

A.G. 1047.



CRAB APPLE, JOHN DOWNIE

Gathering and Storing the Crop.—Gather the nuts only when the husks are quite brown, and spread them out in some dry, airy space till they have lost their moisture. It is most important to have the husks thoroughly dry before they are stored away. The nuts may be stored in jars or casks, sprinkling a little salt over each layer, and then storing in a cool cellar, etc., till required for use. Others store them in hermetically-sealed tins. Should the husks become discoloured, place the nuts in a sieve over a charcoal fire on which sulphur has been placed. This will restore the husks to their natural brown colour.

Pests.—The foliage is liable to injury by the larvæ of the Winter, Mottled Umber, Buff-tip, and Nut-leaf Blister Moths, Leaf Weevils, Nut Aphis, Nut Sawfly, and Leaf Hopper Fly; the buds by the Nut Bud Mite; and the fruit by the Nut Weevil. See chapter on "Pests."

Varieties of the Cobnut.

There are many varieties, but the following are the most prolific and best flavoured ones:

Cosford.—An abundant bearer. Shell very thin, with a husk nearly the length of the nut. Nuts roundish, and borne in clusters of six. Flavour, sweet and good.

Kentish Cob.—The best sort to grow on a large scale. Nuts, very large; husk flattish. Flavour, excellent. Very productive. A good grower; does well on stony land. Nuts keep well. Known also as Lambert's Filbert.

Pearson's Prolific.—A hardy, compact grower. Abundant cropper. Nuts, of medium size, with short husk and sweet kernels. Shell somewhat thick. Begins to bear early.

Varieties of the Filbert.

Following are the best varieties:

Frizzled, or Prolific.—A variety with hairy husks double the length of the nut, and with crimped or frizzled margins. Very quaint nuts, small, oblong, thin, and slightly flattened; borne six to twelve in a bunch. Flavour, sweet and rich. A free bearer.

Red Filbert.—A moderate grower and medium bearer. Nut, medium-sized, ovate, with a thick shell. Kernel covered with a crimson skin. Flavour, good.

Webb's Prize.—A vigorous grower and a free bearer. Nuts, large; husks smooth and longer than the nut; shell, thick; kernel covered with a red skin. Flavour, very rich. A good keeper.

CHAPTER IX.

The Crab.

REFERENCE has been made in the chapter devoted to the Apple to the use of the Crab Apple as a stock for the cultivated varieties of apples. Our purpose here, however, is to deal with the cultivated forms of the varieties of Crab Apples, the fruit of which is so highly esteemed for making jellies, etc. These forms of the Crab are not only valuable for their fruit, but also for their ornamental effect in the garden. Their blossoms are pretty in late spring, and their gaily-coloured fruits are decidedly effective in the early autumn. They are, moreover, of easy cultivation, and may be grown in the shrubbery, on the lawn, or in a special plot by themselves.

Soil.—They will succeed in any soil that will suit the requirements of the Apple; so that everyone who has room for a tree or two in the garden, shrubbery, or orchard may grow them.

Form of Trees.—For the shrubbery, lawn, or the orchard, standards are the most suitable form of tree. For garden culture, pyramids grafted on the Paradise are best. In the latter case, summer and winter prune as advised for the Apple.

Culture.—Plant in November or not later than February, precisely as you would an apple tree. Standards will then require no further attention beyond keeping the centres of the trees open, and thinning out overcrowded growth. Pyramids should be planted 12ft., and standards about 18ft. apart.

Varieties.

There are a number of pretty kinds in cultivation, among which we strongly recommend the following as very good:

Dartmouth.—A fine fruiting variety, bearing large, deep crimson-coloured, plum-like fruits, which, when ripe in autumn, make a delicious preserve.

John Downie.—A handsome Crab bearing oval-shaped fruits in clusters; colour, scarlet and yellow. A free bearer and a neat grower.

Scarlet Siberian.—This is commonly called the Cherry Apple, its small, globular, highly-coloured fruits being cherry-like in shape and size, and borne on long stalks. A very beautiful variety.

The Orange.—A rather quaint-fruited Crab. The fruit is small, roundish in shape, and of a yellow colour, marked with black dots.

The Transparent.—A variety which bears large, rich yellow fruits, flushed with red, on long stalks. May be eaten raw for dessert. A decidedly ornamental kind to grow as a standard. When ripe the flesh is more or less transparent.

Propagation.—Same as advised for the Apple, which see.

CHAPTER X.

The Cranberry.

THE CRANBERRY (*Oxycoccus palustris*) grows wild on boggy heaths and marshes in the northern parts of this island. It has creeping, slender stems and white flowers, succeeded by small, globular, red berries, which ripen in autumn. The latter have an acid flavour, but they make very palatable tarts and jellies.

Another species, the American Cranberry (*Oxycoccus macrocarpus*) bears oval berries, double the size of currants, which are ripe in September. This species is a native of North America. Being better flavoured, the latter is cultivated in preference to the former.

Culture.—Cranberries require a moist situation and a peaty soil to cultivate them successfully. Choose a site for the bed close to a stream or a pond, dig out the soil about 2ft. below the surface of the water, put in a layer of stones 1ft. deep, and on this place 1ft. of peaty soil. Plant in early autumn, placing the plants about 2ft. apart each way, and cover the bed, if possible, with a thin layer of sand. Let the water in to moisten the soil, then prevent more coming in till the following summer, when again flood the beds occasionally.

Propagation.—This is effected by division of the plant in early autumn.

CHAPTER XI.

The Currant.

THE CURRANT is a typically British fruit. We have not, any way, to record our indebtedness to the Greeks or the Romans for its appearance in our gardens. The fact of its being indigenous to Britain, Northern and Central Europe, and Canada, would naturally preclude its being grown in such warm countries as Greece or Italy.

When it was first cultivated we have no exact data. Gerarde is the first to refer to the Currant, and that in an indirect way. He says, in his account of the Gooseberry: "We have in our London gardens another sort, altogether without prickles, whose fruit is verie small, lesser by much than the common kinde, but of a perfect red colour, wherein it differeth from the rest of its kinde." Lord Bacon alludes to them later on as "Corrans." There is no doubt the Dutch grew both the white and the red Currants extensively, probably before we did; but, anyway, both have been popular fruits in large and cottage gardens for a very long time.

The White Currant is simply a variety of the Red Currant (*Ribes rubrum*). The Black Currant (*Ribes nigrum*) is a distinct species, and was formerly known as the Quinsy Berry, because a decoction of its fruits was—and, in fact, is still—used as a remedy for colds and affections of the throat.

The modern word "Currant" is a corruption of "Corinth," the Grecian province from whence our dried currants of commerce are obtained. These, however, are the dried fruits of a small variety of grape. In this country good housewives make a very excellent wine from the berries of the Red and the Black Currant. White Currants are used mainly for dessert, and the red ones also for dessert, cooking, and preserving. The leaves of the

Black Currant were formerly used in a dry state for adulterating tea.

Propagation.—Currants are readily propagated by seed, but this method is not to be commended, as seedlings vary considerably in their bearing capabilities. The best of



Fig. 23.
CUTTING OF
RED CURRANT.
All the growth buds
except the upper
three are removed.

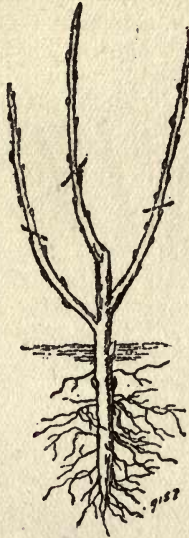


Fig. 24.
A "MAIDEN"
RED CURRANT TREE.
Three shoots are produced
the first year, and these
require to be pruned as shown
by short lines.

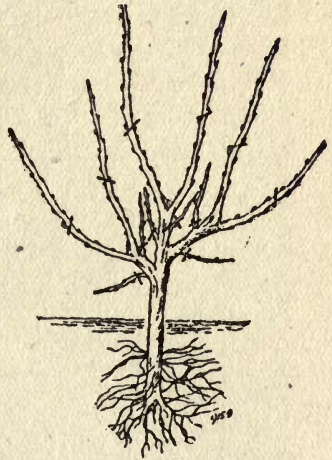


Fig. 25.
A TWO-YEAR-OLD
RED CURRANT TREE.
Short lines indicate where to prune
the shoots.

all methods is by cuttings. In October or November select strong young shoots of the current year's growth about a foot long. Cut the base off close to a joint, and remove all growth buds except the upper three. Insert the cuttings 6in. deep in the soil, and 6in. apart in rows 1ft. asunder. Tread the soil quite firm. Any ordinary

soil will suffice. Allow the cuttings to remain until the following autumn, then lift and replant them where required to grow permanently. In the case of Black Currants there is no necessity to remove the lower buds, as the more shoots there are growing from the base the more fruitful will the trees be. (See Fig. 23.)

Soil and Situation.—Black Currants require a moist

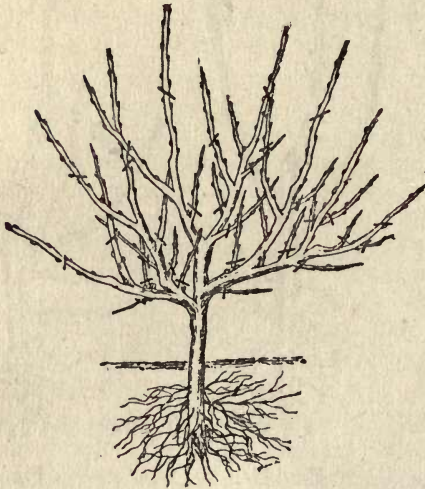
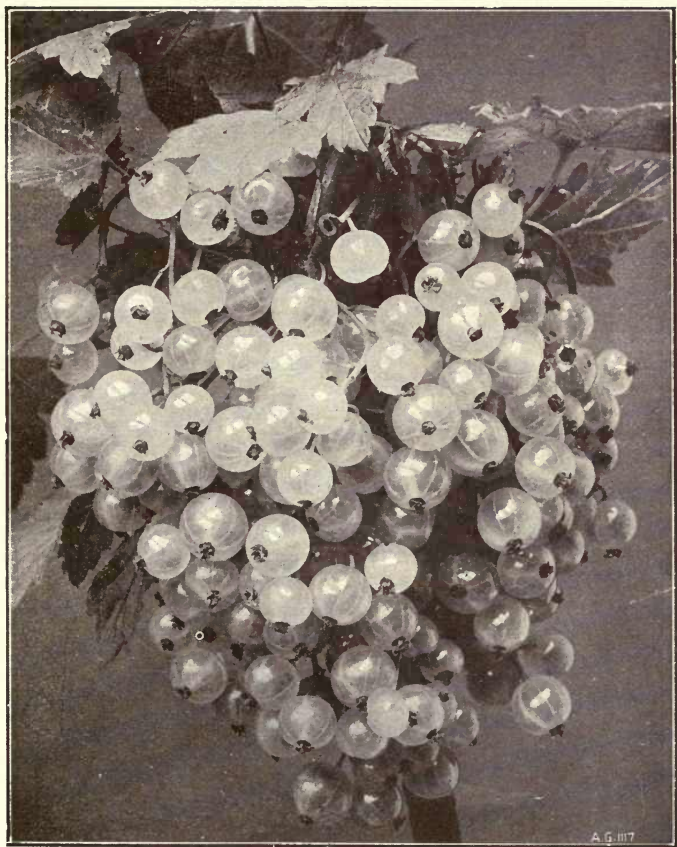


Fig. 26. A THREE-YEAR-OLD RED CURRANT TREE.

Short lines show amount of pruning required.

loamy soil to do well. Dry, sandy, or very light soils are unsuitable. Red and White Currants, on the other hand, will not thrive on damp or very heavy soils; a moderately light one, well enriched with manure, will suit their requirements best. In all cases an open, sunny position is essential for their successful growth.

Forms of Trees.—Black Currants are grown as bushes, planted 6ft. apart each way. Red and White Currants



CURRENT, THE WHITE DUTCH.



GOOSEBERRY, THE STOCKWELL.
Season : Mid-early.

may be grown as bushes (Fig. 26) for ordinary cultivation, or as single, double, and triple cordons (Fig. 9), and standards (Figs. 32 and 33). Cordons are suitable for growing against low walls or fences, and standards on borders by the side of paths. Very fine fruit may be obtained from cordons, and, when trained to a wall or fence, it is possible to preserve the fruit for a long time from birds by fixing fish-netting over the trees. Cordons should be planted 12in. apart.

Standards are reared from cuttings in autumn. In spring, when new growth begins, allow the topmost young shoot to grow, training it up a stake, and shorten any side shoots that form to two leaves. When the leader has attained a height of about 4ft., cut off its point in autumn. In the following season three or more side shoots will form. Let these grow till the following winter, then prune them to about 8 or 9in., when the foundation for the head will be assured. At the same time cut clean away any spurs that may have formed on the main stem, so as to leave the latter perfectly clear. Standards may be planted 6ft. apart by the side of paths.

Garden Culture.—As already explained, Currants may be grown in plots by themselves or between pyramid or bush-trained fruit trees in mixed plantations, or by the side of garden paths. In the latter case, they should be planted at least 4ft. from the paths. The best time to plant is in November, but it may be done as late as February. Dig out holes 2ft. wide and one spit deep. Fork up the subsoil, and, if poor, mix some well-rotted manure with it. Place the bush in the centre, and cover the roots with about 6in. of soil, and tread it down firmly, afterwards mulching the surface with manure. When the trees have been planted a year they should be given annual mulchings of rotten manure in winter. The best way to do this is to remove the soil to a depth of 4in. and a diameter of 3ft. or so around each bush, add 3in. of manure, and cover this with soil. In summer frequent

applications of liquid manure will be beneficial, increasing the size of the berries. To protect the fruit from birds, enclose each tree in a piece of fish-netting.

Culture on Walls and Fences.—The Black Currant may be grown as a fan-trained tree against east or north walls or fences. Red and White Currants may also be grown in a similar fashion, or as cordons. The former should be planted 6ft., and the cordons about 1ft. apart. Those grown on a north aspect will ripen their fruit a month later than those grown in the open garden. A good way



Fig. 27. A FOUR-YEAR-OLD
RED CURRANT TREE.

Short lines indicate where to prune
in winter.



Fig. 28. AN ESTABLISHED
RED CURRANT TREE.

Main branches furnished with fruit
spurs the result of careful summer
pruning.

of utilising vacant space between wall-trained pears, etc., is to plant it with cordon Red and White Currants. The trees should be trained in a vertical position.

Mode of Bearing.—The Black Currant bears its fruit on the shoots of the preceding year's growth; also on spurs on the older wood. Red and White Currants bear their fruit on spurs of the old wood, and at the base of the previous year's growth.

Summer Pruning.—This is only practised in the case of Red and White Currants. It consists of pinching off

the points of lateral shoots to the fifth leaf from their base, and shortening the leading shoot at the extremity of each branch to about one foot whilst the bushes are young; but when fully grown, shorten them to five leaves, the same as the laterals. Do this in June. In



Fig. 29.

MODE OF TRAINING
RED CURRANTS
AS STANDARDS.

First year's growth
with two basal shoots,
summer pruned, to form
fruiting spurs.



Fig. 30.

MODE OF TRAINING
RED CURRANTS
AS STANDARDS.

Second year's growth
with summer - pruned
laterals on main stem.



Fig. 31.

MODE OF TRAINING RED
CURRANTS AS STANDARDS.

Third year's growth with fruiting
spurs up main stem and branches
at apex to form future head of tree.

the case of cordons, shorten the laterals to five leaves, but leave the leader untouched unless the tree has reached its allotted height.

Winter Pruning.—Red and White Currants should have all lateral shoots shortened to half an inch from their

base, and the leading ones to 6 or 8 in., according to their vigour. Old and weak growths should also be cut out, and the centre of the bush kept as open as possible. Cordons should be treated similarly as regards their laterals; the leader, however, must be shortened to 1 ft.

Black Currants merely require to have old and exhausted wood freely cut away, also the two-year-old shoots thinned out, preserving the previous year's shoots to yield fruit. See that the centre of the trees is kept open. Those grown against walls or fences should also have the two-year-old growths cut out, nailing all the new wood in to the wall or fence. The aim should be to have a Black Currant bush bristling with new wood. The latter must not be shortened, but left its full length. Prune as soon as the leaves fall.

Pests.—The chief kinds are the Currant Aphides, which infest the points of the shoots; the larvæ of the Currant Clearwing Moth and the Currant Shoot Moth, that bores into the pith of the shoots; the larvæ of the Currant Saw-fly and the Gooseberry Moth, which feed on the foliage; and the Woolly Currant Scale that infests the branches. There is also the Black Currant Bud Mite, which causes the buds to become swollen and deformed. See chapter on "Pests."

Diseases.—The Currant Anthracnose; the Currant Coral Spot; and the Currant Leaf Spot are the chief diseases that attack Currants. See chapter on "Diseases" further on.

Varieties of Black Currants.

Following are the best sorts of Black Currants:

Baldwin's Black.—A robust-growing and free-cropping variety. Berries, large. Bunches, medium-sized. Flavour, sweet. Suitable for garden culture.

Black Naples.—A good variety for garden or wall culture. Berries, very large. Bunches, medium-sized. Flavour, juicy, sweet, and rich. Heavy cropper.

Boskoop Giant.—A variety of Dutch origin bearing

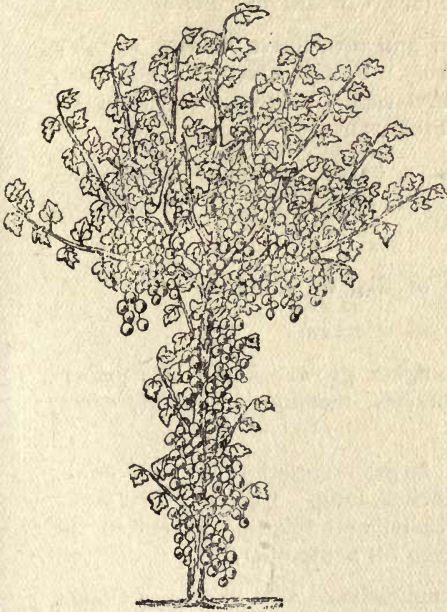


Fig. 32. MODE OF TRAINING RED CURRANTS AS STANDARDS.

Fourth year's growth with ample main branches to form the head.

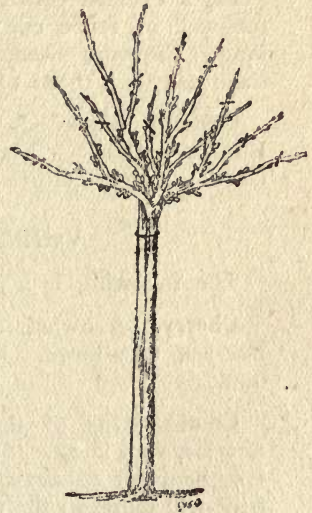


Fig. 33. A STANDARD TRAINED RED CURRANT TREE.

Result of training as illustrated in Figs. 29 to 32.

The spurs are now cut away, leaving a clear main stem.

monster bunches of large berries. The finest of all the Black Currants. Berries, very large. Bunches, long and very large. Flavour, delicious. Suitable for bushes or walls.

Coronation.—A new variety of great promise. Berries,

large Bunches, long. Flavour, very sweet. Suitable for bushes or walls.

Laxton's Blacksmith.—A new and vigorous variety which resists "Big Búd Mite" attack. Berries, exceptionally large. Bunches, long and of great size. Flavour, excellent. The largest Black Currant in cultivation.

Lee's Prolific.—An old and productive variety suitable for wall or fence culture. Berries, large. Bunches, long. Flavour, sweet and rich. Berries hang later on the trees than those of other sorts.

Ogden's Black.—A very hardy sort. Berries, large. Bunches, short. Flavour, very good. Free bearer. Good for bush culture.

Varieties of Red Currants.

The following is a good selection:

Cherry.—A dwarf, compact grower and free cropper. Berries, very large. Bunches, medium. Flavour, excellent.

Comet.—One of the largest varieties in cultivation. Berries, very large. Bunches, long. Flavour, very good. Excellent for cordons, walls, and fences. If netted the fruit will hang on the trees till September.

Fay's Prolific.—A comparatively new variety. Comes early into bearing. Berries, very large. Bunches, long and large. Flavour, good.

Houghton Castle.—A sturdy grower and prolific bearer. Good for bush culture. Berries, medium. Bunches, short. Flavour, briskly acid.

Laxton's Perfection.—The largest Red Currant in cultivation. Berries, very large, 17 to 20 on a bunch. Colour, dark crimson. Flavour, very sweet and juicy. Heavy cropper.

Raby Castle.—A good variety for cordons, walls, fences, or to grow as a bush. Berries, large. Bunches, long. Flavour, slightly acid. Keeps well, if protected, on walls.

Red Dutch.—A good old sort. An abundant cropper. Berries, large. Bunches, long. Flavour, briskly acid. Suitable for bush culture.

Varieties of White Currants.

Common White.—A good bearer. Berries, medium. Bunches, short. Flavour, very sweet.

White Dutch.—A good variety for walls, fences, or bushes. Berries, large. Bunches, medium. Flavour, sweet.

White Versaillaise.—A fine variety. Berries, transparent. Flavour, very rich. Bears freely.

CHAPTER XII.

The Fig.

THE FIG (*Ficus Carica*) is a native of Western Asia, Northern Africa, and Southern Europe. It is a deciduous tree growing some 15 to 30ft. high in warm climates. The fruit has been used as an article of food from the earliest period of human history. It is mentioned many times in Holy writ, and was extensively grown and eaten by the ancient Greeks and Romans.

It is considered probable that the Fig was introduced with the Vine into this country by the Romans, but there are no reliable data on that point. There is evidence, however, that Cardinal Pole introduced trees from Italy early in the sixteenth century, and caused them to be planted in the archiepiscopal garden at Lambeth Palace. Archbishop Crammer is also reputed to have brought trees from Italy and planted them in the Manor House Gardens at Mitcham, in Surrey. Thomas à'Beckett is also said to have planted Figs in the Manor Gardens at Tarring, Sussex, in the twelfth century. The remains of a fig garden exist there at the present day. The variety grown is the Brown Turkey, and the trees annually bear good crops of fruit.

Gerarde, in the sixteenth century, refers to the Fig in his "Herbal," and recommends the trees to be grown on a hot wall. Parkinson, early in the seventeenth century, advises them to be grown in tubs in the Orangery. Philip Miller, early in the eighteenth century, seems to be the first gardener to have taken up the culture of the Fig in real earnest. He introduced many new varieties from Italy, and grew them with great success on walls. From that time the Fig was largely planted in gardens, and even on cottage walls.

In the South of England, including the Isle of Wight, the Fig is grown as a standard in the open air, but in other parts on walls, also in pots or planted out under glass.

Mode of Bearing.—The Fig is somewhat distinct in its fructification. It has no visible flowers, and many persons have consequently imagined that none were borne by the Fig. As a matter of fact, it does bear flowers, but they are not externally visible on the branches. They are really concealed within the fleshy bodies which we call the fruit.

Says the "Treasury of Botany": "The fruit is generally shortly turbinate, but some varieties are of an elongated pyriform shape; the skin soft, with shallow longitudinal furrows; the colour yellowish-white, greenish-brown, purplish-brown, violet, or dark purple. It consists of a hollow fleshy receptacle, with an orifice in the top, which is surrounded and nearly closed by a number of imbricated scales, as many as 200, according to Duhamel. The flowers, unlike those of most fruit trees, make no outward appearance, but are concealed within the fig on its internal surface; they are male and female, the former situated near the orifice, the latter in that part of the concavity next the stalk. On cutting open a Fig, when it has attained little more than one-third its size, the flowers will be seen in full development, and, provided the stamens are perfect, fertilisation takes place at that stage of growth. But it often happens that the stamens are imperfect, and no seeds are formed; nevertheless the fruit swells and ripens."

The Fig forms three distinct crops of fruit annually. The first one appears on the previous year's growth; the second and third ones in the axils of the leaves of the current year's growth. It is only the first crop that attains maturity in the open air in this country; the others, although they may look promising, never ripen, but eventually fall off. The gardener, therefore, need not bother

about the fruit on the young shoots; it is to that on the previous year's wood that he must look forward to ripen about August or September.

Propagation.—The Fig may be reared from seed, but seedlings do not come true to type. The best method of increasing the Fig is by means of cuttings of short-jointed shoots of the previous year's growth about 8 to 12 in. long, each having an inch of older wood attached to its base. Insert the cuttings 6 in. deep in a warm, sheltered border in October or November, and when frost sets in cover the exposed parts with litter. Leave the cuttings alone until the following autumn, then lift and replant where required to grow. Figs may also be increased by bending a branch down to the soil in summer, securing it firmly with a peg, and covering the pegged portion with a few inches of soil. Sever the layer in autumn, and plant in its permanent quarters. Rooted suckers at the base of trees may be dug up in autumn and replanted where required to grow.

Soil.—The Fig is somewhat particular in regard to soil. It will not fruit freely in heavy or rich soils, the resultant growth being too gross to ripen properly, and without well-ripened wood fruit is out of the question. The Fig succeeds best on a chalky or calcareous soil. Moreover, it must have its root area restricted. Where there is about 18 in. of loam overlying chalk Figs will do well. In other soils a special bed should be made for each tree by digging out the soil 2 ft. deep and 6 ft. wide. If the subsoil is clayey put in 6 in. of brickbats or stones, and cover these with lime concrete. If loamy, simply add 6 in. of old brick and mortar rubbish, rammed down hard. Fill up the space with two parts of loam and one of old mortar rubbish, or chalk nodules, then the Fig may be expected to make a sturdy and fruitful growth.

Aspect.—Standards will only succeed in southern or sheltered districts. Trained trees do best on south walls,

but they are occasionally grown on east and west aspects, though not so successfully. It may be taken as a golden rule that a south aspect is best for the Fig, and the wall should be not less than 10ft. high. Figs will not fruit freely on fences.

Distances for Planting.—For trees grown against walls 12 to 15ft. apart is a suitable distance to plant. Standards should be 15ft. apart each way. Wall trees are grown on the fan-trained system.

Planting.—The best time to plant young trees grown in the open is as soon as the leaves fall in autumn. Those procured in pots should, however, not be planted before April. Spread the roots out to their full length, and plant them sufficiently deep for them to be covered with about 3in. of soil. Firm planting is essential. The branches should only be loosely secured to the wall the first season. After planting mulch the surface of the soil with manure, and if the weather should be dry, give a good watering occasionally.

Summer Pruning.—The great point to study in the successful cultivation of the Fig is to avoid overcrowding of the shoots. Therefore, care should be taken to train the growths far enough apart so that the sun can have full access to each one. Summer pruning should take the form of disbudding or rubbing off superfluous young shoots likely to overcrowd the tree later on. Do this early. Then in the case of other lateral shoots that are likely to grow too long for the space, pinch off their points at the sixth leaf, but on no account interfere with other shoots. Keep all suckers removed.

Winter Pruning.—As a rule, very little winter pruning is required; in fact, the less a Fig is pruned the better, as pruning encourages rank growth and little fruit. As soon as the fruit is gathered go over the tree and cut away any weak growths, leaving the best-placed and stronger ones untouched. There must be no shortening

of the shoots, only thinning out. Here and there it may be necessary to cut a branch back to a well-placed young growth in order to keep the lower part of the tree well furnished with bearing wood. Prune as soon as the leaves fall, then the wounds will heal quickly.

Root Pruning.—To ensure fruitfulness in young trees the latter should be lifted, judiciously root pruned, and replanted every two or three years as soon as the leaves fall. Even older trees are benefited by an occasional lifting and root pruning. It encourages sturdy growth and promotes fruitfulness, and answers better than pruning the branches.

General Details.—In dry seasons and on shallow soils Figs will require copious and frequent waterings. Heavy mulchings of manure are also beneficial in summer for keeping the surface cool and preventing loss of moisture. In cold districts the trees should be protected in frosty weather by covering with thick garden or straw mats. Another good plan is to unfasten the branches from the wall, tie them in bundles, and encase them in strawy litter and mats. These coverings should be gradually removed in early spring, after the frost has disappeared. The necessary training of the branches to the wall by means of nails and shreds should be done before new growth begins.

Pests.—The chief pests infesting the Fig outdoors are various Scale insects and Red Spider, the former attacking the shoots and foliage, and the latter the foliage.

Diseases.—The Fig Mould attacks the fruit and causes it to rot, otherwise there are no diseases of any importance. See chapter on "Pests."

Varieties.

Of the Fig there are many varieties, but the following selection represents those best suited for outdoor culture:

Black Ischia.—A good hardy and free-bearing variety. fruit, medium-sized. Shape, turbinate. Colour, deep purple. Flavour, luscious and sweet; one of the best. Season, early August.

Brown Turkey.—A most abundant cropper, and the hardiest kind for outdoor culture. Fruit, large. Shape, pyriform. Colour, brownish-red, covered with blue bloom. Flavour, rich and sugary. Season, August.

White Marseilles.—Another hardy and free-bearing variety. Fruit, medium-sized. Shape, roundish pyriform. Colour, pale green. Flavour, succulent, sweet, and very rich. Season, August to September.

CHAPTER XIII.

The Gooseberry.

THE GOOSEBERRY of gardens is a cultivated variety of the Wild Gooseberry (*Ribes Uva-crispa*), a European species. The wild form is occasionally met with in the Eastern and Northern Counties. It does not appear to have been known to the Greeks and the Romans, as they do not allude to it in their writings.

The earliest mention of the fruit occurs in the reign of Edward I., 1276, plants of it being purchased and planted in the King's garden at Westminster. Tusser, in his work on "Husbandry," published in King Henry VIII.'s time, refers to it in the following quaint lines:

"The barberry, respis, and gooseberry, too,
Look now to be planted, as other things doe."

Lord Bacon also mentions the Gooseberry as one of the earliest fruits. In Gerarde's time (sixteenth century) Gooseberries were extensively grown in gardens. Hence the fruit being so well known, and so universally grown, it has found favour with rich and poor alike.

In Lancashire, more especially, Gooseberries were grown during the early part of last century with great success by the weavers and colliers. Gooseberry shows were popular features, and growers vied with each other in endeavouring to produce the biggest berries, for the chief point of excellence at these shows was the largest and heaviest berries. The workers used to spend hours in their gardens in training their trees, and in feeding them so as to secure the heaviest berry, and win the coveted prize. As showing the immense size of some of these fruits obtained by Lancashire growers, we may mention a variety named London, one berry of which

weighed, in 1852, 37dwt. 7gr.; in 1864, 36dwt. 4gr.; and in 1865, 33dwt. 12gr. Many of the Lancashire sorts at the present day yield berries ranging from 27 to 31dwt.

Apart from these monster berries, the ordinary kinds grown to-day yield delicious fruits for use in a green state for tarts, and in a ripe condition for jams, dessert, etc. The Gooseberry, indeed, is a most refreshing and useful fruit, and deserves a place in every garden.

Propagation.—The Gooseberry may be increased by seeds, cuttings, layers, suckers, and division, but the only method that possesses any real practical value is by means of cuttings. Seedlings do not come true to type,



Fig. 34. GOOSEBERRY CUTTINGS.

All growth buds except the upper three removed.

and it often happens that after cultivating the seedlings for some years till they reach the fruiting stage, all of them prove worthless. Layering is a slow process; suckers rarely make good fruitful bushes; and division of old plants is unsatisfactory.

The only satisfactory way, as already mentioned, is by cuttings. These are formed from shoots of the current year's growth in October. Select shoots about a foot long, cut the base off straight across close to a joint, and remove all buds from the lower half, leaving three or more at the apex. Open shallow trenches 4in. deep, place the cuttings 6in. apart against one side, fill in the soil, and tread this down firmly. The rows should be a foot apart. By the following autumn the cuttings will

have rooted and formed two or three shoots each. They can then be lifted and planted where required to grow. The object of removing the lower buds from the cutting is to prevent suckers springing up. When only the upper buds are left the bush has a good clean stem, with branches only at its apex. (See Fig. 34.)

Soil and Situation.—The Gooseberry loves a moist loamy and rich garden soil. It will not thrive in light, dry



Fig. 35. AN ILL-GROWN GOOSEBERRY TREE.

A sucker has formed at the base as the result of not having removed the lower buds from the cutting.

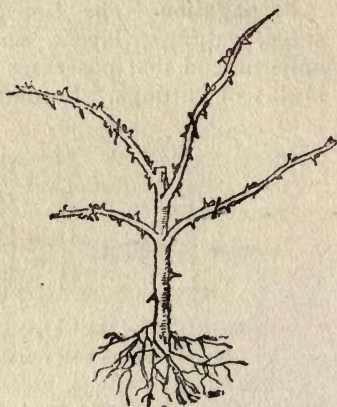


Fig. 36. A "MAIDEN" GOOSEBERRY TREE.

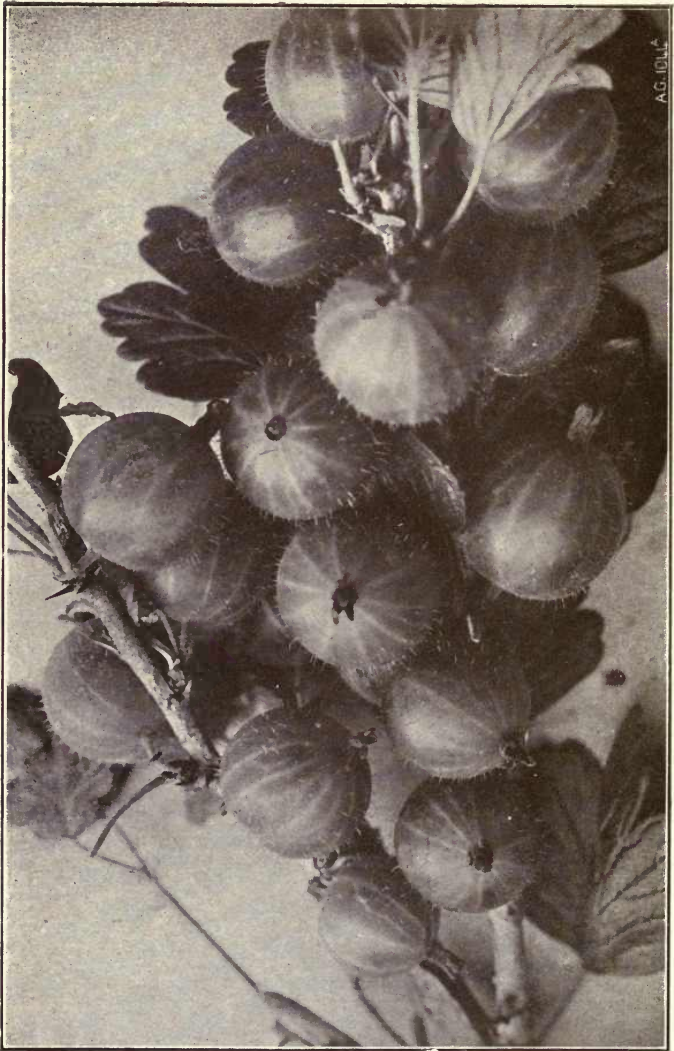
First year's growth. Lines show where to prune. A variety of erect habit.

soils or very hot positions. The reason why the Lancashire Gooseberries have always been so famous is on account of the moist climate, and for the same reason they do not succeed so well in the South as in the North and Midlands. Soils that are heavy should be deeply trenched, and have plenty of rotten manure and vegetable refuse mixed with them. Those inclined to be light should be liberally enriched with cow manure.



GOOSEBERRY, THE LEADER.
Season: Early.

AG. 10114



GOOSEBERRY, LANGLEY BEAUTY.

Season : Mid-early.

Forms of Trees.—The Gooseberry can be grown as a bush, a fan, cordon (Figs. 41 and 42), or standard (Fig. 33). Bushes are the usual dwarf trees, and require to be planted 6ft. apart each way. Fan-trained trees, to be planted 5ft. apart, are suitable for low walls or fences facing north or west; cordons, to be grown 1ft. apart, with one main stem furnished with spurs, also for low walls or fences facing



Fig. 37. A "MAIDEN"
GOOSEBERRY TREE.

A variety of pendulous habit. Lines show where to prune. Shoot must be pruned to a bud pointing upwards.

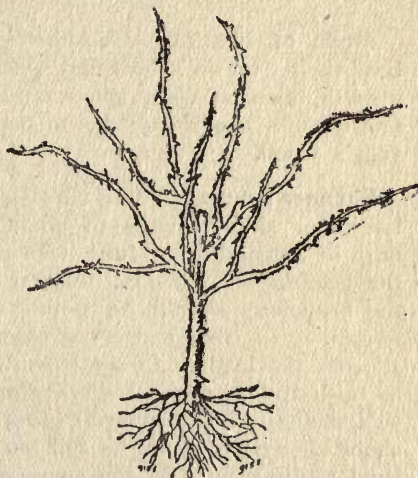


Fig. 38. A TWO-YEAR-OLD GOOSE-
BERRY TREE.

Lines show where to prune. Variety of erect habit.

north or west, and for trellises in the open garden. Standards form a pretty kind of tree for growing by the side of garden paths. They are obtained by grafting any of the drooping varieties on stems 2ft. high of the strong upright-growing sorts. Such trees can be obtained of most nurserymen. Standards grafted on *Ribes aureum*, with stems 3ft. to 4ft. high, are also available. These have neat, compact heads. Plant them 5ft. apart.

Planting.—The trees can be procured from the nursery as maidens—one year old—or as fruiting specimens, two to three years old. The best time to plant is in October or November; but, weather permitting, it may be done up to March. See that the roots are moist, and all bruised portions cut off before planting. Plant the roots about 4in. deep, and tread the soil firmly. After planting mulch with decayed manure.

Mode of Bearing.—Gooseberries, like Red Currants, bear their fruit on shoots and spurs of the previous year's growth, also on older spurs on the main shoots. The finest fruits are always borne on the young or previous year's wood.

Summer Pruning.—This consists of shortening all young lateral or side growths to about five leaves from their base in the middle of June. In the case of young trees, the leading shoots—i.e., those growing at the ends of the branches—should be permitted to grow their full length. In the matter of older or fully-grown trees, shorten the leaders to six leaves. These remarks apply to bush and standard trees. Cordons require all young side shoots to be shortened to four leaves, and the leading shoot allowed to grow its full length. Fan-trained trees need to be pruned in the same way, each branch being treated like a cordon. The object of summer pruning is the removal of superfluous growth, and the concentration of the energies of the tree upon the production of fruit buds. The removal, therefore, of a portion of the foliage permits sun and air to have access to the inner part of the tree, and consequently facilitates the ripening of both wood and fruit.

Winter Pruning.—Trees that have been properly summer pruned will not require any excessive amount of winter pruning. The best time to prune is in November or December, but in districts thickly infested with bullfinches and other birds it is wise to defer the operation

till spring. Still, if due care be taken to protect the trees, as advised further on, there is no reason why they should not be pruned at the proper season.

The first step in winter pruning is to shorten all the laterals to within an inch of their base to form spurs. This applies to all forms of trees. The second thing to do is to cut out all sickly or exhausted wood, and to thin out the main branches, so that there is ample room for future new growth to develop without overcrowding the tree. The third operation consists in just cutting off

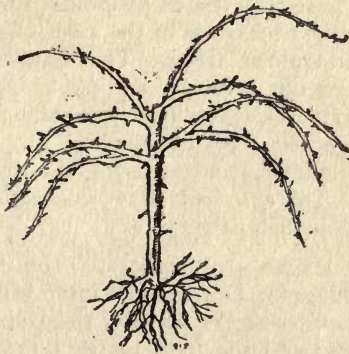


Fig. 39. A THREE-YEAR-OLD GOOSEBERRY TREE.

Lines indicate where to prune. Variety of pendulous habit.

the soft tips of the leading shoots. Do not shorten these unduly, because it is on these that the finest berries are usually borne. Varieties of a drooping habit should have all lower branches cut away that have a tendency to fall too close to the soil, otherwise the fruit will get splashed with dirt in rainy weather, and be spoiled. At the same time, in pruning, always cut back to a bud pointing upwards, not downwards. (See Figs. 35 to 40.)

General Details.—In winter some protection of the fruit buds from the attack of birds should be afforded. A

simple and effective method, where there are only a few trees to deal with, is winding black cotton freely over the bushes. The birds cannot see this until they come into actual contact with it, then they become startled and fly off. The next best plan, where a number of trees are grown, is to spray them with a mixture of quicklime, sulphur, soft soap, and water. This will adhere to the bushes, and prevent the birds touching the buds. See chapter on "Pests," further on.

When the fruit has attained a fair size, it is advisable to thin out the berries, so as to relieve the strain on the tree, and also assist in the development of larger fruits. This is especially necessary in the case of cordons, standards, and fan-trained trees. The Lancashire growers thin their berries out severely, and place saucers of water under each berry, the water nearly touching the latter, so as to encourage the fruit to swell.

See also to manuring and watering the trees, as advised for Currants. The ripe fruit may be protected by enclosing the bushes in fish-netting.

Pests.—The leaves are subject to the attack of the larvæ of the Magpie, Dot, and Winter Moths, the Red-legged Weevil, Gooseberry Sawfly, the Gooseberry Aphis, and Red Spider; and the fruit to the larvæ of the Allied Sawfly.

Diseases.—The most serious of the diseases is the American Gooseberry Mildew; and others are the Gooseberry Die-Back, Black Rust, Leaf-cluster Cup, and Leaf Mildew. See chapter on "Diseases."

Varieties for Dessert.

We propose to confine our selection to eighteen varieties, believing that these will afford an ample number for the average grower to cultivate:

Broom Girl.—Fruit, very large and hairy. Shape, roundish. Colour, yellowish. Flavour, excellent. Season, early. Free bearer.

Champagne.—There are three varieties of this Gooseberry, and all are first-rate sorts. They are known respectively as the Red, White, and Yellow Champagne. Fruit, small and hairy. Shape, roundish-oblong. Colour,

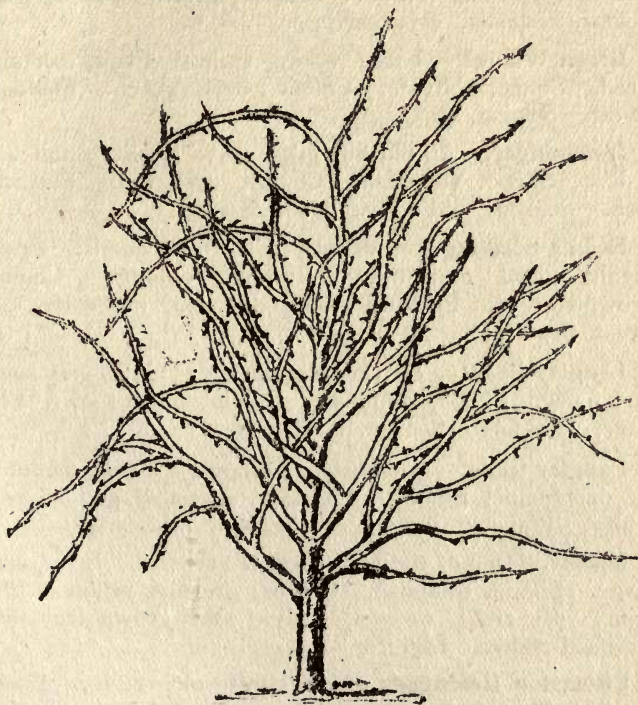


Fig. 40. AN ESTABLISHED GOOSEBERRY TREE.

Tree has its branches well thinned out and just the soft tips only of its shoots removed.

red (Red Champagne), white (White Champagne), yellow (Yellow Champagne). Flavour, sweet and rich. Season, mid-early for Red and White Champagne; late for Yellow Champagne.

Golden Gem.—A very fine Gooseberry. Fruit, medium-sized. Shape, roundish-oblong. Colour, buff-yellow. Flavour, exceptionally good. Season, early. Free bearer.

Green Gascoigne.—An abundant bearer. Fruit, small and hairy. Shape, round. Colour, green. Flavour, delicious. Season, very early.

Green Walnut.—A free-bearing variety. Fruit, medium-sized. Shape, obovate. Colour, dark green. Flavour, sweet. Season, early.

Ironmonger.—An old but good sort. Fruit, small and hairy. Shape, roundish. Colour, dark red. Flavour, rich. Season, mid-early. Good bearer.

Keen's Seedling.—A variety of first-rate quality. Fruit, medium-sized and hairy. Shape, oblong. Colour, brownish-red. Flavour, rich. Season, mid-early. A great bearer.

Langley Beauty.—A very fine variety. Fruit, very large and hairy. Shape, roundish. Colour, buff-yellow. Flavour, very fine. Season, late.

Langley Gage.—An enormous cropper. Fruit, medium-sized. Shape, roundish. Colour, greenish and silvery-white. Flavour, very fine. Season, mid-early.

Leader.—One of the finest yellow varieties. Fruit, very large. Shape, roundish. Colour, greenish-yellow. Flavour, very rich. Season, early. Well-grown fruit has weighed 28dwts. 14grs.

Pitmaston Greengage.—A first-rate old variety. Fruit, small. Shape, obovate. Colour, green. Flavour, rich and sugary. Season, late.

Red Warrington.—One of the best for dessert or preserving. Fruit, medium-sized, and hairy. Shape, roundish-oblong. Colour, red. Flavour, very rich. An abundant bearer. Season, late.

Snowball.—A good white kind. Fruit, very large and

hairy. Shape, round. Colour, creamy-white. Flavour, first-rate. Season, early. Free bearer.

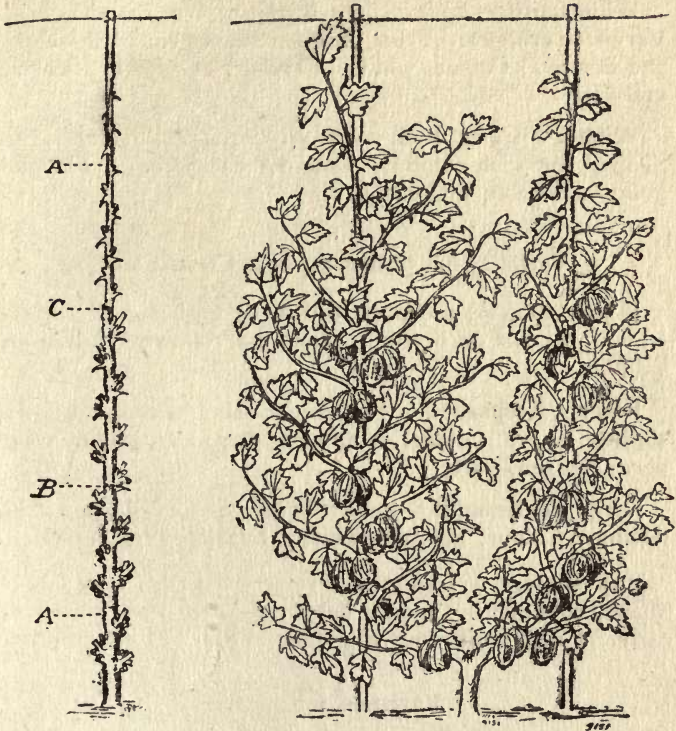


Fig. 41.

Fig. 42.

Fig. 41. A SINGLE CORDON GOOSEBERRY TREE.

A, Shows position of first year's growth. *B*, The second year's growth. *C*, The third season's growth. Note the stem is clothed with fruit spurs.

Fig. 42. A DOUBLE-STEMMED CORDON GOOSEBERRY TREE.

The left-hand branch has not had its laterals summer pruned; the right-hand one has.

Whinham's Industry.—Good sort for dessert, preserving, or gathering in a green state for tarts, etc. Fruit,

large and hairy. Shape, roundish. Colour, red. Flavour, good. Season, late. Free cropper.

Whitesmith.—An excellent variety, one of the best. Very free cropper. Fruit, large. Shape, roundish-oblong and downy. Colour, white. Flavour, excellent. Season, mid-early.

Wilmot's Early Red.—An old variety. Fruit, large. Shape, roundish-oblong. Colour, dark red. Flavour, good. Season, mid-early.

Varieties for Gathering in a Green State.

If Gooseberries are preferred to be gathered in a green state for tarts or bottling, then the following kinds are suitable:

Berry's Keepsake.—Fruit, square-shouldered and large, slightly hairy. Colour, when ripe, green. A prolific cropper. Season, early.

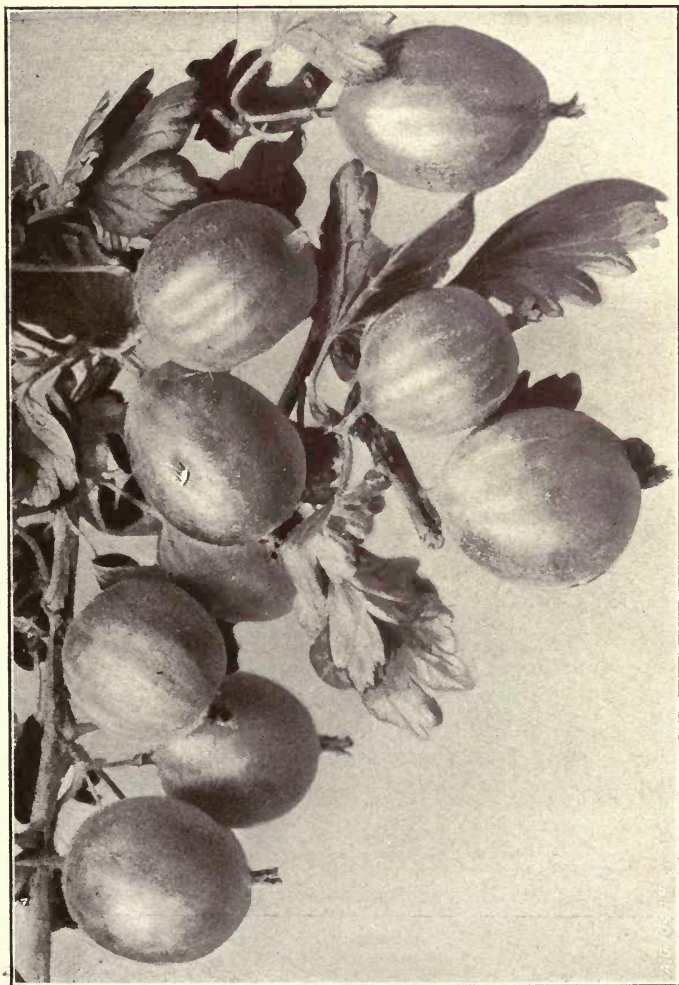
Large Whitesmith.—Fruit, large. Shape, obovate, and downy. Colour, greenish-white. Season, very early.

May Duke.—A Devonshire variety. Fruit, very large. Shape, roundish. Colour, deep red when ripe. Season, early. Green fruit ready to gather in May. Free cropper.

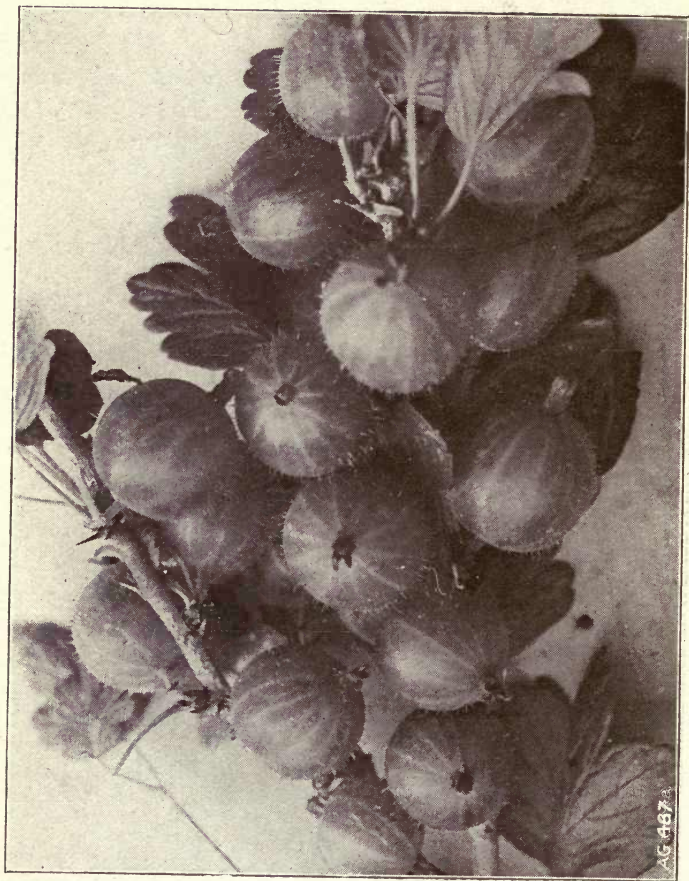
Varieties for Size.

The following are remarkable for the size and weight of their berries. Suitable for exhibition or dessert, where large berries are preferred.

Antagonist.—The largest white Gooseberry in cultivation. Fruit, very large. Shape, long. Colour, creamy-white, with green veins. Flavour, very good. Average weight of a single berry, 34dwts. 21grs. Season, mid-early.



GOOSEBERRY, WILMOT'S EARLY RED.
Season : Mid-early.



DESERT GOOSEBERRY, GOLDEN BALL.

AG 487

Careless.—A handsome variety. Excellent cropper. Fruit, very large, and downy. Shape, long. Colour, creamy-white. Flavour, very good. Season, mid-early. Average weight of a single berry, 31dwts. 19grs.

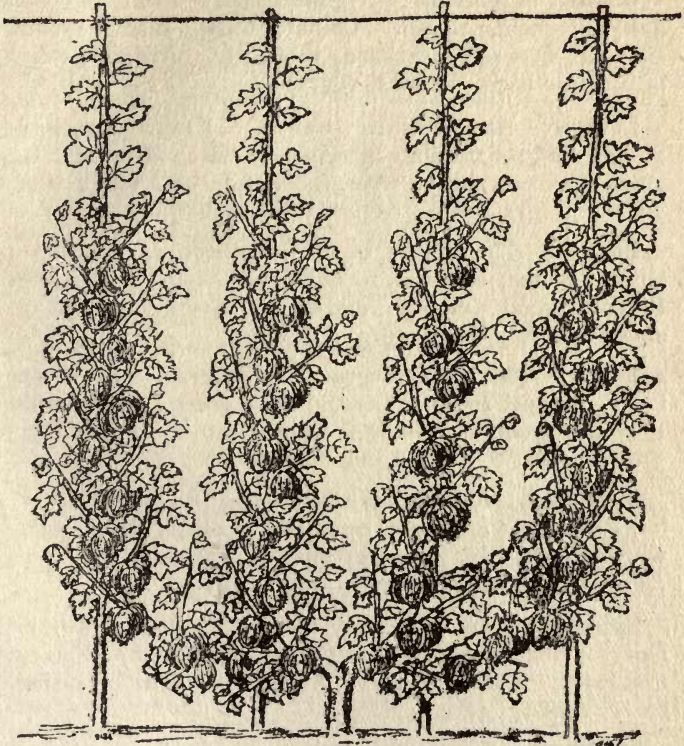


Fig. 43. A FOUR-STEMMED CORDON GOOSEBERRY TREE.

Specially suitable for low walls or fences in small gardens.

Catherina.—A free bearer. Fruit, large and hairy. Shape, obovate. Colour, orange-yellow. Flavour, first-rate. Season, mid-early. Average weight of a single berry, 32dwts. 8grs.

Companion.—A good cropper. Fruit, very large. Shape, roundish and very hairy. Colour, light red. Flavour, first-rate. Season, early. Average weight of a single berry, 31dwts. 11grs.

Gunner, or Cobbam.—A good bearer. Fruit, large and hairy. Shape, round. Colour, olive, shaded yellow. Flavour, first-rate. Season, mid-early. Average weight of a single berry, 28dwts. 18grs.

Leveller.—An excellent bearer. Fruit, very large. Shape, long. Colour, greenish-yellow. Flavour, very good. Season, early. Average weight of a single berry, 30dwts. 11grs.

London.—The largest of all Gooseberries. Fruit, very large. Shape, roundish to oblong. Colour, purplish-red. Flavour, good. Season, mid-early. Average weight of a single berry, 37dwts. 7grs.

Shiner.—The heaviest green Gooseberry. Fruit, very large. Shape, round. Colour, light green, shaded white. Flavour, good. Average weight of a single berry, 31dwts 19grs. Season, mid-early.

Snowdrop.—A very beautiful Gooseberry. Size, very large and hairy. Shape, roundish. Colour, white, veined with green. Flavour, excellent. Season, mid-early. Average weight of a single berry, 34dwts. 5grs.

Speedwell.—An excellent bearer. Fruit, large, and hairy. Shape, roundish. Colour, light red. Flavour, first-rate. Season, early. Average weight of a single berry, 29dwts. 4grs.

Stockwell.—Fruit, very large. Shape, long. Colour, bright green. Flavour, good. Season, mid-early. Average weight of a single berry, 30dwts. 18grs.

Thumper.—A fine Gooseberry. Fruit, large. Shape, flattish. Colour, green. Flavour, excellent. Average weight of a single berry, 30dwts. 9grs. Season, late.

CHAPTER XIV.

The Grape Vine.

THE GRAPE VINE (*Vitis vinifera*) has been cultivated by man from the earliest period of human history. Frequent references are made to it in Holy Writ. In Genesis, for instance, we are told that Noah planted a vineyard and made wine. The Romans and Grecians also cultivated the Vine extensively. It is assumed that the former introduced the Vine into England. We learn that the Emperor Domitian, in the first century of the Christian era, ordered the destruction of the Vine in Britain, France, and Spain for some reason or other; and that two centuries later the Emperor Probus commanded that the Vine should again be cultivated in this island. Rumour goes so far as to say that the Emperor Probus preferred the wines of Britain to those of Iberia and Gaul.

In the earlier centuries vineyards were numerous. They were chiefly attached to monasteries, the monks in those days paying special attention to the cultivation of the Vine and other fruits. In the Domesday Book thirty-eight vineyards are recorded as being then in existence. Gloucestershire is recorded to have been famous for its vineyards, and others existed in Kent, Norfolk, Surrey, etc. In the twelfth century, it appears, the interest in Vine growing began to decline, and vineyards practically disappeared with the suppression of the monasteries in the reign of King Henry VIII. Henceforth the culture of the Grape for wine-making was carried on mainly in France. The end of the eighteenth century saw the disappearance of the vineyard in England. Some forty years ago the then Marquis of Bute planted a vineyard at Castel-Coch, in Glamorganshire, and in later years some excellent wine was made from the produce. The Royal

Horticultural Society have planted a collection of vines for trial in their gardens at Wisley, in Surrey, with a view to ascertaining what varieties are suitable for planting for wine production in this country.

Whether the result will be favourable to the re-establishment of vineyards in England, we cannot say. But Vines have for some two centuries or more been grown against walls. Before the introduction of glass houses they were grown against hollow walls heated by flues. Since glasshouses were introduced, the cultivation of the Vine has become universal, both in private and market gardens. Admittedly the best-flavoured fruit is grown under glass, the artificial warmth ensuring the more perfect development and ripening of the fruit. But it is possible, given suitable varieties, to grow some excellent grapes on south walls in the southern parts of this island, as may be seen by the many vigorous and fruitful Vines grown on cottage and house walls generally.

In this chapter we shall deal with the outdoor culture of the Vine only.

Propagation.—The usual and simplest method of propagating outdoor Vines is by cuttings of well-ripened wood of the previous year's growth. Select a shoot about 12in. long, cut off its point close to a bud, and remove it from the parent stem with a slight "heel" of older wood attached. Pare the edges of the latter off smooth, and remove all buds except the two upper ones. The cutting thus prepared should be inserted two-thirds of its length in the soil and where the Vine is to be permanently grown. It is not advisable to insert it nearer than 6in. to the wall. The cuttings may be put in any time between November and March. Vines may also be reared from seed, but this is an uncertain method, the trees requiring many years to reach their bearing stage, and then often producing worthless fruit.

Soil.—Any good ordinary garden soil suffices for outdoor Vines. There is no necessity to make special bor-

ders for them; indeed, such would only be of any service for a year or so, as the roots would soon extend beyond the limits of an ordinary border. Many people do not seem to be aware of this important fact. They often dig in manure around the base of the stem, or apply liquid manure, both of which can be of no possible service to the Vine, because its feeding, or fibrous, roots are not located anywhere near the stem, but many yards away in the garden. It is therefore useless to apply manures, or even water, to old Vines, because they cannot benefit by either.

If the soil is not particularly good, dig out a hole 3ft. or 4ft. square and 3ft. deep, and fill this with a compost of two parts loam and one of equal proportions of old mortar, burnt earth, or wood-ashes, but add no manure. If the site should be damp, put 6in. of brickbats in the bottom to serve as drainage. This will give the Vines a good start, after which the roots will, of course, penetrate into the neighbouring soil, and take care of themselves.

Planting.—The proper season to plant Vines is in October or during February. The Vines, as a rule, are purchased in pots. Carefully turn them out, and remove the drainage from the base of the ball; then unravel the roots, and spread them out evenly where they are to grow. Cover them with about six inches of soil, and then tread the soil down firmly. After planting mulch the surface of the soil with manure, and loosely secure the branches to the wall.

Position.—The only aspect on which Vines will ripen their fruit properly is a south wall. They will grow on other aspects, it is true, but they will not develop their berries to perfection.

Pruning and Training.—There are three methods of training a Vine on a wall. One is to plant the Vines, say, 3ft. apart, and train each up with one stem, as is

done with those grown under glass. The laterals in this case are allowed to develop at intervals of 15in., and these are spurred back in winter to one eye or bud from their base. This is practically cordon training. A second method, and the one usually practised, is to grow one plant only on a wall, and to allow these to develop shoots which are subsequently trained horizontally and vertically to cover the wall.

The third plan is to let the shoots grow as they please, and simply secure them to the wall. The last method is, however, more picturesque than profitable. We commend the second plan as the best for general adoption. In this case the Vine, when planted, should be shortened to 18in. In due course three shoots will form. Train these out widely apart the first year. In winter shorten the two lower shoots to 3ft. or 4ft., and train them out horizontally—one to the right and the other to the left. The central shoot train upright, shortening it also to 3ft. or 4ft. The following summer laterals will form on the horizontal shoots or branches. Rub off any that form on the lower side of the stems, and retain those that develop on the upper side. These should be about a foot apart; any that form at a less distance should be rubbed off. When those retained get long enough, train them to the wall.

Now as to the vertical stem, laterals will develop on this, and the best should be retained at intervals of 18in. to form future horizontal stems to be trained into position, like the first pair, the following winter. These must be shortened in winter to 3ft. or 4ft., and trained horizontally to the wall. The topmost lateral must also be shortened to 3ft. or 4ft., and trained vertically to form a continuance of the main stem. The laterals that were trained to the wall on the upper side of the first pair of horizontal stems will require to be pruned to one eye from their base to form fruiting spurs. The lateral growth at the extremity of each horizontal stem must be trained

along to extend the latter, and be shortened to 3ft. or 4ft., according to its vigour.

The same practice must be pursued each year of continuing the main vertical stem, and laying new horizontal ones until the Vine has covered its allotted space. The Vine eventually will be like a horizontally-trained pear tree, and all that will be necessary is the annual pruning of the laterals to form spurs.

Disbudding.—This is an important operation, which must have due attention to maintain the Vine in good health and in a free bearing condition. When the spurs are formed, new laterals will form at each in spring. In some cases one lateral only may form at a spur; in others several may do so; and, as one only must be allowed to grow at each spur, the remainder—the weakest—must be rubbed off when they are an inch or so long. Remember also that no laterals should be permitted to grow on the lower side, only on the upper one. When the laterals have grown four or five inches long bunches of fruit should be seen developing in the axils of the leaves. As soon as these are seen, pinch off the points at the first leaf beyond the bunch, or, where no fruit can be seen, at the fourth leaf from the base. This disbudding and pinching will keep the growth in order, and greatly simplify the management of the Vine. (See Fig. 44.)

If a Vine be grown as a cordon, all that has to be done is to allow laterals to develop a foot apart on each side of the stem, prune these in winter to one eye, and in subsequent years disbud and pinch as above advised.

Thinning the Berries.—When the berries attain the size of radish seeds they should be thinned out moderately by means of a pair of fine-pointed grape scissors. Cut out the smallest berries, and especially those in the centre of the bunch.

Watering and Feeding.—In the earlier stages of their

growth Grape Vines require plenty of water in dry weather, with occasional applications of liquid manure. Older Vines, however, push their feeding roots far and wide, and render it impossible to get at them. It is therefore useless pouring water or manure near the main stem, as there are no roots to benefit by the liquid. During hot weather outdoor Vines are greatly benefited by syringing

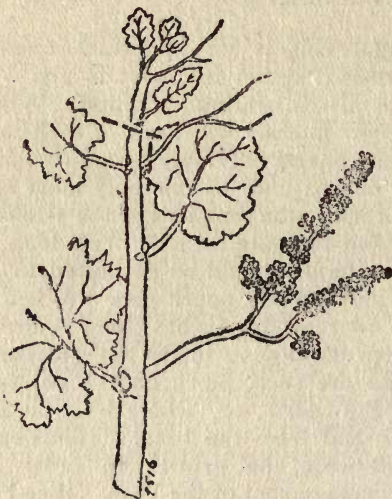
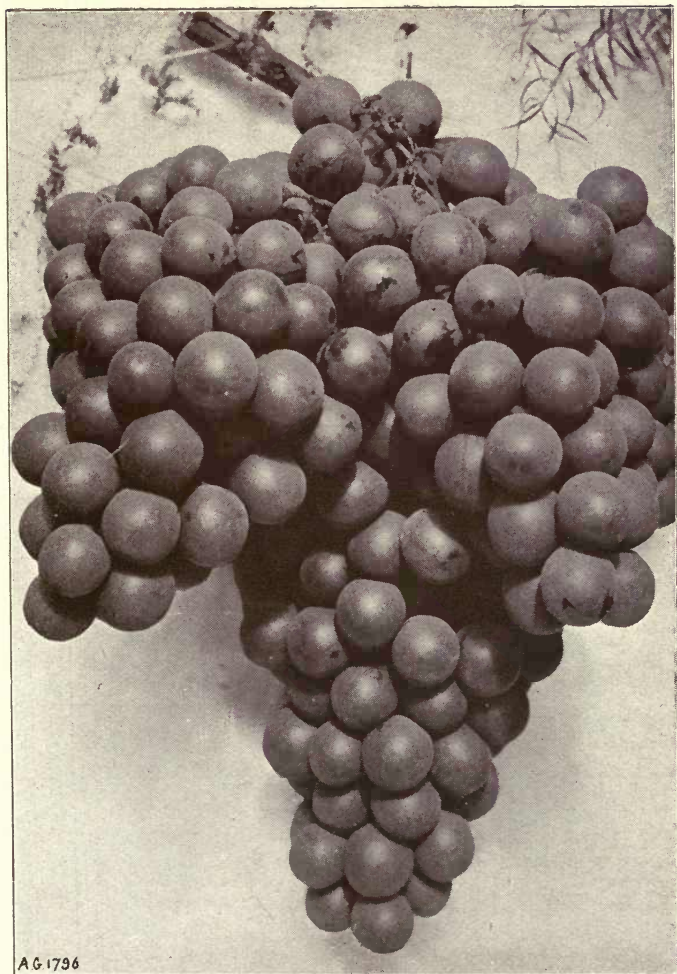


Fig. 44. FRUITING VINE LATERAL.

The cross lines show where the point of the shoot should be removed as soon as the bunch forms, also where to remove the tendrils.

the foliage every evening with water. This greatly refreshes the foliage, and also helps to keep it in a clean, healthy condition.

Pests and Diseases.—The chief disease that attacks Grape Vines grown outdoors is the Vine Mildew (*Oidium Tuckeri*); with Vine Scale, Wasps, and Red Spider in the way of insects. See chapter on the subject further on.



AG 1796

BLACK HAMBURGH.

An early Black Grape, a popular variety for outdoor cultivation.



A.G.795



GRAPES BEFORE AND AFTER THINNING. The left-hand bunch is overcrowded with undersized berries. The right-hand illustration shows the result of judicious thinning out of the berries.

Varieties.

The following are the most suitable varieties for growing on walls outdoors:

Black Hamburgh.—The best black Grape for outdoor culture. Flesh, rich and juicy. Berries, large, roundish, black. A free bearer.

Black July.—An early, sweet, and juicy Grape; generally ripens well. Good cropper. Berries, small, round, and purplish.

Black Prince.—A free-bearing variety. Berries, oval, medium-sized, purplish-black. Bunches rather long. Flavour, second-rate.

Royal Muscadine.—An early, free-bearing white Grape. Berries, small, greenish-yellow. Flesh, very sweet and rich. The best Grape for outdoor culture.

CHAPTER XV.

The Loganberry.

THE LOGANBERRY is of American origin, and is reputed to be the result of a cross between a variety of the Western Dewberry, or Blackberry (*Rubus vitifolius*), named Aughinbaugh, and a variety of the Raspberry (*Rubus Idæus*), supposed to be the old Red Antwerp. It was raised by an American enthusiast named Judge Logan, of Santa Cruz, California, in 1882. The original plant was one of fifty seedlings. Card, an American authority on fruit, says: "In the character of the plant, and in the shape and conformation of the fruit, the variety is essentially like the Aughinbaugh, propagating entirely by tips. The core remains with the fruit, like the Blackberry, its principal resemblance to the Raspberry being in colour and flavour, although the Dewberry dominates in flavour."

Then the raiser (Judge Logan) goes on to say: "As to the fact of the plant being a hybrid between the Blackberry and Raspberry, of course there is no absolute proof. The colour, with the distinct Raspberry flavour of the fruit, and the circumstances under which it originated, I think, render the fact of such a cross almost certain."

Whatever its real origin, the Loganberry has certainly proved a worthy addition to berried fruits, and adapted itself to successful cultivation in this country.

Habit and Characteristics.—The shoots are Bramble-like in habit and upright in growth, prickly, and with Vine-like leaves. The fruit is large, Mulberry-like in form, and of a deep red colour when ripe. The flavour is rich and luscious, and the fruits are suitable for dessert or cooking purposes. Moreover, the fruit is firm in texture, and keeps well on the plant or when gathered. The

plant also possesses a vigorous constitution. It comes into bearing early, and continues to yield for some time.

Propagation.—We cannot do better than reproduce some very clear hints on this topic from the pen of that able expert, Mr. J. Lansdell, which appeared in "Amateur Gardening":

"Young plants are obtained by layering, which is so simple that it only requires a stone about the size of a duck's egg laid on the points of the young shoots about the end of September, the points of the shoots lying on the ground. These should be left until spring, by which time new roots will have formed under the stone. The shoot may then be cut off behind the stone, and should then be trained up in its appointed place. The young plant may remain where it has taken root, or be taken up with a ball of soil and planted in a more suitable spot. It is better to plant them where they are to remain at this stage than to allow them to grow through the summer and plant them in the autumn; although the latter can be done when it is more convenient to do so.

"Strong young growths may be layered their whole length. To do this, a cut should be made with a sharp knife, putting it in about an inch behind each bud, cutting half-way through the shoot, then bringing it upward about an inch past or above the bud. Peg down at each bud, and cover the whole shoot with soil, except the leaves, then roots and a plant will be formed at each joint.

"The whole of the young shoots may be cut up, and put in as cuttings, using two buds to each cutting; the lower leaf, but not the bud, should be cut off when the cuttings are put in. The cuttings root more readily when put into a cold frame during the winter."

Soil and Position.—Loganberries will succeed in good ordinary soil. Those of a strong loamy character are specially suitable, but they will also succeed well in light

or sandy soils if plenty of good rotten manure be mixed with them. Deep digging is most essential. A sunny position is desirable, but not imperative. The Loganberry can be grown as a single clump, or trained over arches; or it may be grown in rows. It may also be successfully grown on a north or east wall.

Culture.—The best time to plant is in October or March. If to be grown in quantity, plant 6ft. apart in rows 9ft. asunder. Like the Blackberry, the shoots should be cut down to the ground when planted, to encourage strong young shoots to develop for bearing fruit the next year. A stout post, 6ft. to 8ft. high, should be placed to each plant, and strands of stout wire 1ft. apart be fixed to these for training the shoots to. The shoots should be trained each way, so that sun and air can gain access to them. In summer mulch heavily with rotten manure, and as soon as fruit forms give plentiful supplies of water in dry weather, and liquid manure, cess-pool contents, or house slops. Loganberries are gross feeders, and therefore will not, on light soils, object to being fed even in winter with liquid manures occasionally.

Pruning.—Each season, as soon as the plants have ceased fruiting, cut out all shoots that have borne fruit, and also thin out weak shoots of the current year's growth. In autumn cut off the soft tips of all the remaining growths and train them to the trellis. In some soils the shoots will grow 10ft. to 15ft. long in the season. These very long shoots should be bent down to the top of the trellis and shortened accordingly. Avoid retaining too many shoots, as overcrowding means inferior fruit.

Gathering the Fruit.—Do not gather the fruit until it is fully ripe, as until then its true flavour is not properly developed.

Culture on Walls.—The Loganberry also does well grown against a lofty east or north wall. A cottager in

Kent utilises the east wall of his house for growing the Loganberry, and secures very heavy crops of exceptionally fine fruit every year, which he disposes of to profitable advantage. His method is to cut out all the weak young growths in early summer, also remove the old shoots directly they have ceased fruiting, and then train the strong young growths to the wall to bear fruit the next season. He feeds the roots liberally with house slops and liquid manure, and thus obtains admirable results. We have also seen the Loganberry growing and fruiting freely on the north wall of an inn at Broadheath, Worcestershire.

Laxtonberry.—Closely allied to the Loganberry, and requiring similar cultural treatment is the Laxtonberry, the result of a cross between the Loganberry and the Superlative Raspberry. It was raised by the Messrs. Laxton Bros., of Bedford. The berries are very large, have the flavour of the Raspberry, and, like the fruit of the latter, are easily pulled off the stalk when ripe. It has therefore, unlike the Loganberry, no hard core. The growth is semi-pendulous, and the shoots grow 6 to 10ft. long during the season. The fruit commences to ripen in June, and successional crops are borne up to November. This new hybrid fruit is therefore a distinct acquisition, and will in due course supersede the Loganberry. The fruit is said to make excellent jam.

The Lowberry, Newberry, and the Phenomenal berry are varieties of the Loganberry, bearing darker-coloured and sweeter fruits. Both require similar cultivation to the parent.

CHAPTER XVI.

The Medlar.

THE MEDLAR (*Pyrus germanica*) is a native of Asia and Europe, and belongs to the Rose family (*Rosaceæ*). It has been found in a wild state in England, but it is doubtful if it is really indigenous to this country. Theophrastus, who wrote 300 B.C., mentions the fruit as being known to the Grecians; and Pliny, the Roman naturalist, refers to three kinds as being grown in Italy early in the Christian era. Tusser, the quaint rhymester, refers to the fruit as Medlars, or Meles, in his day; and Gerarde alludes to the trees as growing in hedges, and to their being grafted upon the Whitethorn. Parkinson also gives a figure of a branch of fruit in his "Paradisi in Sole Paradisus Terrestris," and describes three kinds—the "greater and the lesser English, and the Neapolitan." Chaucer, in the fourteenth century, also sings the praises of a Medlar tree in flower:—

"And as I stood and cast aside mine eie
 I was aware of the finest Medlar tree,
 That ever yet in all my life I sie,
 As full of blossomses as it might be."

The flowers are large, white, and solitary, and borne in June or early July. The fruit is roundish, and crowned by a broad, hairy disc, fringed with a green, leafy calyx. In an unripe state it is hard, brownish in colour, and unfit to eat; but when gathered and stored until it has assumed a state of partial decay, the flesh mellows, becomes soft, and fit to eat, the flavour possessing an agreeable acidity. The fruit, therefore, to be edible, has to become practically semi-decomposed. Fruits that have just begun to ripen make an excellent jelly. In Worcestershire the fruit is allowed to drop off naturally on the

grass, and, when sufficiently mellow, is picked up and eaten.

Propagation.—This is effected by budding and grafting on seedling Pear stocks, or on the Whitethorn or the Quince. Medlars are easily reared from seeds sown an inch deep in the open garden in autumn; but as seedlings rarely come true, or prove fruitful, they are only of service as stocks for budding or grafting good sorts on. Budding should be done in July, and grafting early in April. The Pear and Whitethorn are the best stocks for standards, and the Quince for dwarf trees. Cleft grafting is best for Medlars.

Soil.—The Medlar prefers a deep loamy soil that is fairly moist, but yet not cold and very wet. Where the soils are inclined to be light and dry, the trees should be worked on the Whitethorn stock to ensure their doing really well.

Position.—Medlars will thrive as standards in grass orchards or hedgerows, or as specimens on the lawn, or in any open, sunny spot in the garden.

Form of Trees.—Standards with clear main stems 5ft. to 6ft. high are the usual form of growing the Medlar. They may, however, be grown as pyramids or bushes grafted on the Quince stock, and in this way they form pretty trees to cultivate in small gardens.

Planting.—This may be done any time between November and March. In each case see that the tree is securely staked at planting time. Plant standards 18ft., and pyramids or dwarfs 12ft. apart.

Pruning.—The only pruning required is to cut out dead or diseased wood, and thin out the branches moderately where much crowded in winter. As the fruit is borne on the terminal ends of branches, as well as on old spurs, it will be seen that the less pruning is given the better.

Gathering and Storing the Fruit.—The fruit should not be gathered until well into November; then be stored, calyx downwards, on sheets of clean paper in any light place, such as the shelf of a cool greenhouse or vinery, to mellow or soften, when it is fit to eat. It usually takes about a fortnight to ripen.

Pests and Diseases.—Practically none.

Varieties.

There are four varieties in cultivation:

Dutch.—The best sort for general cultivation. Fruit, large, usually 2in. in diameter. Colour, greyish-green till ripe, then brownish. Flavour, very good. Leaves, large. Free bearer. Good for standard culture.

Nottingham, or Narrow-leaved Dutch.—A smaller-leaved and less vigorous variety. Suitable for pyramids or bushes. Fruit, medium, 1in. in diameter, pear-shaped. Colour, yellowish-brown, marked with russet. Flavour, excellent.

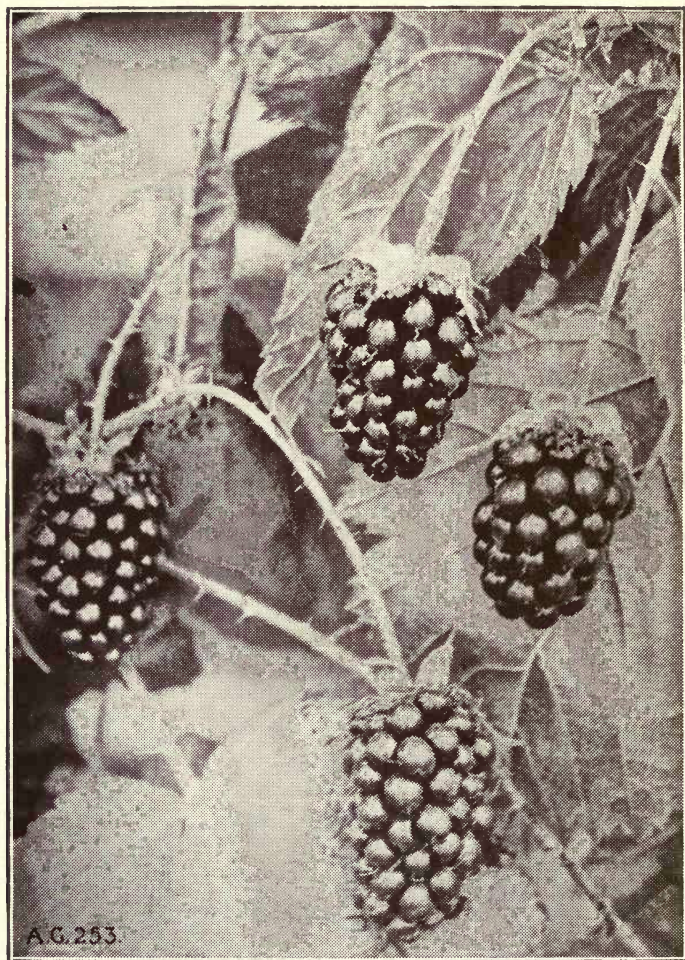
Royal.—A free bearer, suitable for pyramids or small standards. Fruit, medium-sized, roundish. Colour, brownish. Flavour, nice, pleasantly acid.

Stoneless.—A variety without seeds. Fruit, small, turbinate. Colour, russety-brown. Flavour, moderate. Fruit keeps well after gathering. Free bearer.



THE LOGANBERRY.

A hybrid between the Blackberry and Raspberry. A profitable fruit to grow in gardens of all sizes.



A.G. 253

THE LOWBERRY.

Hybrid between a Loganberry and a Blackberry.

CHAPTER XVII.

The Mulberry.

THE MULBERRY (*Morus nigra*) is a native of Persia, and belongs to the natural order *Moraceæ*, the same order as the Fig. It is reputed to have derived its generic name from the Latin word "Mora," which means delay, the fitness of this name arising from the fact that the Mulberry does not put forth its leaves until frosts are over. For that reason it has been called "the wisest of trees." Frequent mention is made of the Mulberry in Holy Writ; also by the early Greek writers Theophrastus and Dioscorides; and the Roman savants, Virgil, Horace, and Pliny.

We owe its introduction into Europe to the Greeks. The Romans, too, esteemed the Mulberry more than any other fruit. It is said that the Mulberry tree was first introduced into England in 1458, the first trees being planted in the gardens of Syon House, Brentford. Tusser refers to the Mulberry in his quaint verses in 1557; and Gerarde, in 1597, mentions that the tree was then growing in sundry gardens in England. King James I. encouraged the extensive planting of the Mulberry, not, however, so much for its fruit, as for feeding silkworms—an industry that, by the way, never made great headway in this country.

Shakespeare alludes to the Mulberry in several of his plays, and was very partial to the tree. King James, by the way, encouraged a French nurseryman to dispose of 100,000 trees in the Eastern and Midland Counties, and there is no doubt that many of the grand old trees met with at the present day were planted during that period. Anyway, the fact remains that, wherever Mulberry trees

exist, the fruit is highly esteemed for its delicious, refreshing juice, whether for dessert, for tarts, or, in many cases, when made into wine. Mulberry wine and cider, indeed, make a delicious drink.

Propagation.—Mulberries may be reared from seed; but, as seedlings take an average lifetime to come into bearing, this method is not worthy of consideration. The best methods are by cuttings or layers. Cuttings should be taken from shoots of the current year's growth that are about a foot long, and be removed with a "heel" of two-year-old wood about 3in. long. Insert such cuttings in a shady position outdoors in October or November, and bury them so that only about two to three of the upper eyes show through the soil. They will then form roots by the succeeding autumn, and can be lifted and replanted elsewhere.

Another method is to saw off a good-sized branch, 4ft. to 6ft. long, trim off the lower branches so as to leave a stem 18in. long, then insert this firmly 18in. deep wherever the future tree is expected to grow. Do this in October. The branch, called a "truncheon," will root without fail, and form a fruitful bush in a year or so.

To layer a branch, simply bend a low branch to the soil, cover a portion of it with a few inches of soil, and peg it down firmly. If this is done in summer or early autumn, the branch will be sufficiently rooted to sever from the parent the following autumn.

Soil and Situation.—The Mulberry requires a rich, deep loamy soil. Shallow, gravelly soils, unless near the margin of a pond where the roots can get moisture in dry weather, are quite unsuitable; and so, too, are chalky soils. The roots like a fair amount of moisture. As regards the situation, the Mulberry does best on a southern aspect, and better fruit is always obtained from trees grown in cultivated soil than on lawns or in grass. In the North the Mulberry requires a south wall.

Forms of Trees.—The Mulberry may be grown as tall standards on stems 6ft. high, or as low standards on stems 3ft. high; also as bushes or pyramids. The first two are suitable when to be grown as single specimens, and the other for cultivation in small kitchen gardens. The Mulberry may also be grown fan-shaped against walls.

Planting.—This should be done in March. Plant the standards 30ft., low standards 20ft., pyramids 10ft., and wall trees 18ft. apart.

Mode of Bearing.—The Mulberry bears its fruit on the previous year's growth, as well as on spurs formed on the older wood. The flowers are greenish-white and inconspicuous, unisexual, and borne in separate axillary catkin-like spikes. The female flower after fertilisation develops into an oblong, juicy berry.

Pruning.—Standards require no pruning beyond the removal of dead or exhausted wood and the thinning out of other branches that are overcrowded. Pyramids require lateral growths to be shortened in July to about six leaves to form spurs. The leaders, unless growing strongly, should not be touched; in any case, merely remove the tips. On walls, train the branches a foot apart, and summer prune all side shoots to six leaves to form spurs. No further pruning is needed.

General Culture.—In dry seasons give the roots an occasional watering. Wall or pyramid trees, if fruiting heavily, may be given a weak application of liquid manure. Fork over the soil in autumn and early spring.

Gathering the Fruit.—The fruit ripens in August and September, and is ready to gather when it assumes a blackish-purple colour. The best way to gather the fruit is to spread cloths on the ground under the branches,

and then give the tree a gentle shake. By so doing, only those fruits that are fully ripe will fall off, and these will be in the best condition for eating. In the case of pyramids and wall trees, the fruit can be gathered by hand.

Pests and Diseases.—There are practically none. Wasps and birds will attack the fruits, but, as a rule, the quantity they devour is small. Large trees are liable to have their branches break off owing to the weight of leaves and fruit; therefore very large ones should be supported by props, or linked up by chains to the main body of the tree.

CHAPTER XVIII.

The Peach and Nectarine.

As these are closely allied to each other—the latter, in fact, being merely a variety of the former—and, moreover, require identically the same cultural routine, we include them in the same chapter. The Peach (*Prunus Persica*) belongs to the same genus as the Plum and Cherry, and is supposed to be a native of China. It is reputed to have been cultivated there two or three thousand years B.C. Some authorities say that the Emperor Claudius introduced it into Italy from Persia.

The first English author to mention the Peach was Gerarde, in the sixteenth century. He describes white, red, and yellow kinds, and remarks: "I have them all in my garden, with many other sorts." Phillips is of a decided opinion that the Peach was first introduced into England in 1524 by a monk named Wolf, who acted as gardener to King Henry VIII. He brought this fruit and the Apricot from Italy. The Hon. Mrs. Evelyn Cecil, in her "History of Gardening in England," states that, "If proof were needed that this fruit were to be had in England [thirteenth century], we have it in the fact that King John, at Newark, in the midst of his despair and disappointment, hastened his end by a surfeit of Peaches and Ale." In Southern Europe, Asia, America, Australia, and New Zealand the Peach and the Nectarine are grown extensively in orchards; but in Britain it is essential to cultivate the trees against a warm wall.

The Nectarine is merely a variety of the Peach, having a smooth skin of a richer colour than the Peach. The Peach has a downy skin, and the fruit is usually much larger than that of the Nectarine. Sometimes one branch of a Peach tree will bear smooth fruits (Nectarines), and

the others downy fruits (Peaches). Stones saved from ripe Peach fruits and sown will often produce seedling Nectarine trees; while stones from a Nectarine fruit will yield Peach trees. Nectarines are generally more luscious in flavour than Peaches.

Propagation.—This is effected chiefly by budding on the Mussel and the St. Julien Plum. Seedling Peach trees, reared by sowing the stones, may also be used as stocks, but the trees grafted thereon are not long-lived in this climate, although they do well so propagated in warm climates. The Mussel and St. Julien stocks are suitable for the average soils in this country. Budding must be performed in July or August. It is not difficult to rear Peaches and Nectarines from stones sown a couple of inches deep in a sunny border or in pots in a cold frame; but as seedlings have to be grown many years before they bear fruit, and then the chances are the fruit will be worthless, the system is not worth pursuing. Grafting, again, is not a reliable method of increase.

Soil.—Granted that the Peach and Nectarine succeed best budded on the Plum stock, and bearing in mind that this stock is surface-rooting, it will be seen that a great depth of soil is not needed. What is wanted is a fairly decent soil, not too light nor too heavy, too dry nor too wet. A happy medium in both is a *sine quâ non*.

Supposing the soil to be very light or sandy, mix some heavy loam, also some burnt soil and old mortar or lime, with it, and dig to a depth of 2ft. If heavy, remove the top spit, dig out the second one and discard it, loosen the third spit, and work in some stones, broken bricks, etc., with it to make it porous. Now replace the top spit, mix charred soil, wood ashes, and lime rubble with it; then fill up to within six inches of the surface with a mixture of loam, burnt soil, wood ashes, and old mortar; place the roots on this, and fill up the remaining space with the same material.

Where the subsoil is damp, dig out a hole 3ft. deep, put in 6in. of concrete, and let this have a gradual slope to a drain; then add 6in. of brick rubble, and fill up with above compost. The hole for each tree should be 4ft. long and 4ft. to 6ft. wide. It is very essential that the roots should not descend into a wet subsoil, so see that the latter precautions are taken before planting.

Where shallow soils overlie a chalk or gravelly subsoil,



Fig. 45. A FAN-TRAINED PEACH TREE.

Peaches, Apricots, Plums, Nectarines, Cherries, and Figs, are trained in this fashion. The short bars indicate the position to prune the shoots in winter.

it will be well to remove 1ft. of the subsoil and replace this with good compost, as advised above. The top spit of a good medium loam that has lain in a heap for a year will make a good staple soil for cultivating Peach trees.

Situation.—Both Peach and Nectarine trees require the shelter of a wall not less than 10ft. high. In the southern parts of England these fruits do best on an east or a

west aspect; but in the Midlands a north or south aspect is best; indeed, the latter is, perhaps, the best all-round aspect for Peaches and Nectarines.

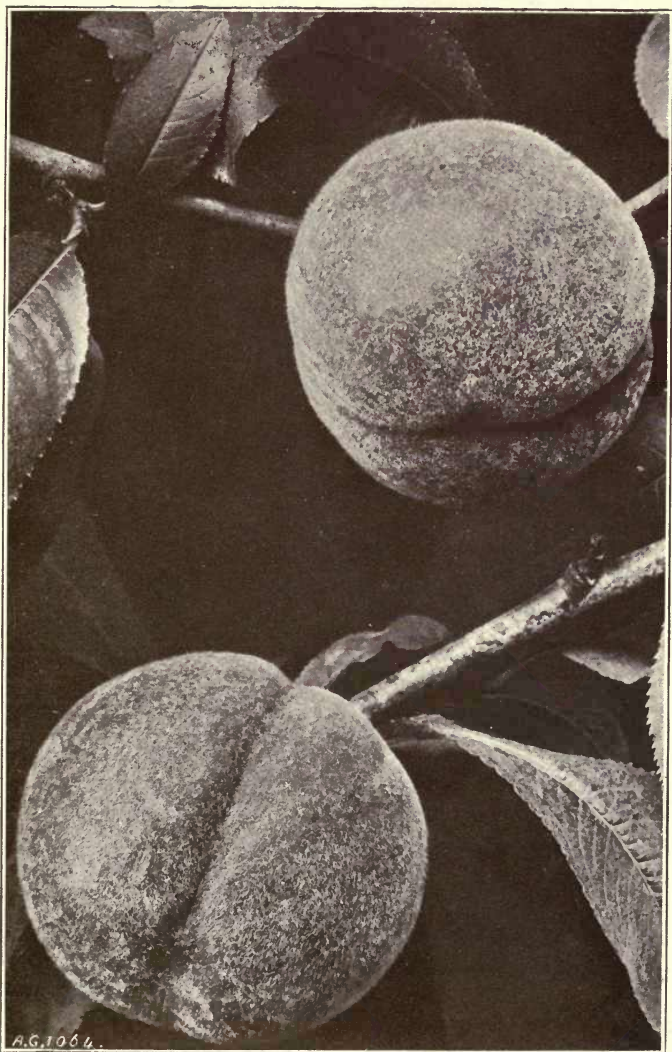
Forms of Trees.—The usual form of tree is the fan. In this case there is a short main stem about 1ft. long, with branches radiating from its apex. This is the dwarf fan. There is also the standard fan, with a main stem 6ft. long, having branches spreading right and left at the top. This form of tree is planted alternately with the dwarfs so as to cover the upper parts of high walls.

Another form of tree is the cordon, which consists of a main stem, with side or lateral bearing shoots. The cordon is specially adapted for low walls—i.e., those about 6ft. or so high—or for filling up spaces between dwarf fan trees. They have to be trained at an angle of 45 degrees.

Then there is a third method—the U-shaped tree—with a short main stem, from which two main branches are trained vertically, these being furnished with lateral bearing shoots. This tree is suitable for walls 10ft. high or so, and enables them to be evenly furnished with bearing wood.

Distances for Planting.—Cordons, 2ft. ; U-trained trees, 4ft. ; dwarf fan-trained trees, 15ft. to 18ft. ; tall fan-trained trees, 30ft. to 36ft. apart.

Planting.—This is best done as soon as the majority of the leaves have fallen off—about October. It should not be done on any account in December or January, nor later than February. See that all bruised ends of roots are cut off, and that the roots are fairly moist. Plant so that the upper roots are covered with not more than 3in. of soil. Tread the soil down firmly, too, as firmness is most essential. Secure the trees loosely to the wall till the spring to allow for the shrinkage of the soil. After the planting is completed mulch the surface with decayed manure.



PEACH, HALE'S EARLY
Season: August.



A WELL-CROPPED PEACH TREE.

Mode of Bearing.—The Peach and Nectarine bear their fruit chiefly on shoots of the previous year's growth; also on spurs. On the former two kinds of buds will be observed, one narrow and pointed, which are growth or wood buds, and the other short, plump buds, which are fruit buds. Sometimes the latter are borne singly by themselves; in other cases there may be two fruit buds together, or one wood and one fruit bud growing side by side; and in others one wood bud with a fruit bud on each side (Fig. 48). Particular notice should be taken

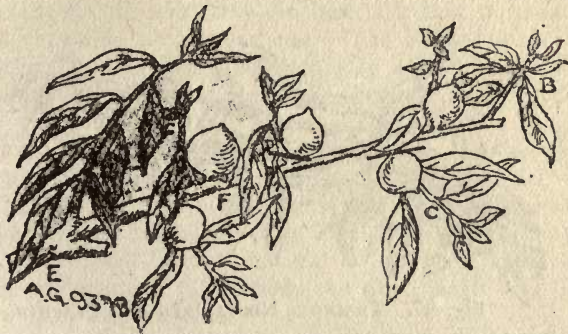


Fig. 46. STOPPING PEACH SHOOTS.

Lateral growths like C C, which grow at the base of fruits, should be shortened to one leaf as shown by short lines. Shoots E and B should be allowed to grow unchecked.

of these buds, so that, when pruning, the mistake is not made of shortening a shoot to a fruit bud.

Disbudding.—The first stage in pruning a Peach or a Nectarine is the disbudding or removal of superfluous shoots. The object of disbudding is to remove young shoots which, if left to grow, would later on overcrowd the bearing wood. It requires to be done by degrees. First of all, rub off with the finger and thumb all shoots when an inch or so long, that grow out of the front or the back of the branches. Next attend to the young

shoots growing at the sides of last year's growth. Select two of these young shoots growing as near the base of last year's growths as possible—one on each side—for retaining to grow to form future bearing wood. Some growers only retain one young shoot, but it is usually wiser to retain two. When, however, it is seen which of the two shoots is going to take the lead, the other may be removed. Now, by means of the finger and thumb, or the point of a budding-knife, remove all other young shoots gradually until you get to the one at the extremity; retain this.



Fig. 47. TRAINING NECTARINES AND PEACHES.

(A) Main branch. (B) Fruiting shoot of previous year's growth. (C) New shoot growing at base of the latter and which must be retained to bear fruit the next season. After fruiting, B should be cut away.

Treat each of the previous year's shoots in the same way, then the tree is not unduly overcrowded—in fact, it is furnished with the requisite number of young shoots that, when ripened, will bear fruit the following year. The shoot left at the extremity of the bearing growth will, when it has made about four leaves, require to have its point removed—"stopped"—at the third leaf. Bear in mind that this disbudding should be commenced when the fruit has set, and then only by degrees, so that no check is given to the development of the young growth by the wholesale removal of shoots at one time. (See Figs. 46 and 47.)

Pruning.—If disbudding is properly carried out, there will be little winter pruning to be done. The best time to prune is in February, when the buds begin to show signs of growing. Then each shoot that has borne fruit should be cut back close to the base of the one of the preceding year's growth, the one that was retained at disbudding time. Some of the last year's growths may have grown unduly long or be weak, or have unripened tips. In their case cut the shoot back to the first wood bud formed at the side, rather than the top.

Be careful to note that the bud is a thin pointed, and not a roundish, or globose one. The former is the wood or future growth bud, and the latter a fruit bud. On no account cut back to a fruit bud, because no growth can take place, and the point of the shoot would, in consequence, die. Failing a wood bud, look out for what is called a triple bud—i.e., three buds, a wood bud in the centre, with a fruit bud on each side. It is quite safe to cut back to a triple bud. (Fig. 48.) The only other pruning needed will be the removal of sickly or dead wood. Once the pruning is finished, the next point will be the training of the growths.

Training.—This consists of readjusting the main and subsidiary branches, and securing to the wall at even distances apart the pruned shoots. These should be distributed sufficiently wide apart to allow for future young growths to be laid in during summer without unduly crowding or shading the fruit. Spread the branches fairly wide over the wall surface, so that the shoots are at least 4in. to 6in. apart. Take care in handling the shoots not to rub off or injure any of the buds.

Thinning the Fruit.—This is a most important operation. The thinning should be done at three different periods. The first thinning should take place when the fruits are half the size of a marble, then removing the very smallest only; the second when they are the size of

marbles; and the third, and last time, when they have formed their stones or kernels. A golden rule is to finally thin Peach fruits one to each square foot, and Nectarines one to every nine square inches. Allowing trees to carry



Fig. 48. PEACH SHOOT WITH BUDS.

(A) Fruit buds. (B) A growth bud. The lower triple bud with growth bud in centre of the two fruit buds is the correct bud to prune to.



Fig. 49. THINNING PEACH FRUITS.

The short lines under each fruit show which to remove to secure fine specimens.

Fig. 49.

heavier crops means inferior fruit, weak growth, and short-lived trees. (See Fig. 49.)

Protecting the Blossom.—Peach and Nectarine blossoms are easily injured by frost. Blooming, as they do, in

February and early March, frosts and cold winds are often prevalent, and the delicate organs of fructification are then specially liable to injury. It is well, therefore, to protect the trees at night, as well as on cold days, by a temporary covering of double or treble thickness of fish-netting, or No. 5 hexagon shading material. This, fixed over poles or wood spars, placed in a sloping position against the wall, will ward off frosts and cold winds. On fine, mild days remove the covering. Commence when the buds begin to burst, and continue so long as cold weather remains.

General Details.—During spring, summer and early autumn, Peach and Nectarine trees must be freely watered to ensure healthy growth and the proper development of the fruit. Examine the soil when the pruning is finished, and if it should be in the slightest degree dry fork over the surface and give a copious watering. Repeat the waterings every two or three weeks, more especially after fruit has formed. In April apply a thick mulch of rotten manure over the soil, and, after each watering, give a dose of liquid manure. During spring and summer it is a good plan to well syringe the trees late in the afternoon of warm days. Daily syringings help to keep the foliage in good health. These, however, must be discontinued when the fruit begins to ripen. For hints on feeding, see chapter on "Manures," further on. As the fruit develops see that it is not shaded by leaves; otherwise the colour will be more or less wanting in richness and the flavour somewhat impaired.

Gathering the Fruit.—The fruit is ready to gather when, on grasping it gently in the hollow of the hand, it parts readily from the branch. If not wanted for immediate consumption, store it in a cool, airy room.

Pests Injurious to the Peach.—The larvæ of the Winter and Peach Moths, the Peach Aphis, Leaf-blister Mite, Red Spider, and the Red-legged Weevil attack the foliage;

Peach and Cushion Scale the shoots; and Woodlice and Wasps the fruit.

Diseases.—The chief diseases are the Peach-leaf Curl, Shot-hole Fungus, and the Silver Leaf. See chapter on "Pests," etc., later on.

Twelve Good Peaches.

The following are a dozen of the best Peaches in cultivation, notable for their excellent flavour, hardiness, and productiveness:

Amsden June.—Fruit, roundish. Size, medium. Colour, greenish-white and red. Flavour, tender, juicy, rich. Ripens early in July.

Barrington.—Fruit, roundish-ovate. Size, large. Colour, yellowish-green and deep red. Flavour, rich and juicy. Ripens in mid-September.

Bellegarde.—Fruit, round. Size, large. Colour, red. Flavour, very juicy and rich. Ripens in early September. A very free bearer.

Dr. Hogg.—Fruit, round. Size, large. Colour, pale yellow, dotted with crimson. Flavour, melting, rich. Ripens in early August. An abundant bearer.

Dymond.—Fruit, round. Size, very large. Colour, greenish-yellow, mottled with red. Flavour, melting, and very juicy and rich. Ripens at end of August. Very hardy and prolific.

Earliest of All.—Fruit, round. Size, medium. Colour, yellowish and red. Flavour, delicious. Ripens early in July. The earliest variety.

Gladstone.—Fruit, roundish-oblate. Size, very large. Colour, pale, mottled with red. Ripens at end of September. Flavour, tender, melting, and juicy. Very hardy.

Hale's Early.—Fruit, round. Size, large. Colour, green, flushed with crimson. Flavour, delicious, juicy. Ripens early in August. An abundant bearer.

Prince of Wales.—Fruit, roundish, flattened. Size, very large. Colour, green to dark red. Flavour, juicy and rich. Ripens in mid-September. Bears freely.

Princess of Wales.—Fruit, roundish, pointed. Size, very large. Colour, green to dark red. Flavour, juicy and rich. Ripens in October. A fine late Peach.

Sea Eagle.—Fruit, round. Size, very large. Colour, lemon-yellow and deep red. Flavour, very rich. Ripens early in October. Not suitable for the North.

Waterloo.—Fruit, roundish, depressed. Size, large. Colour, greenish and dark red. Flavour, melting, juicy, and rich. Ripens in early July.

Six Good Nectarines.

The varieties described are the best for outdoor culture :

Dryden.—Fruit, large to very large. Colour, green, red, and purplish. Flavour, melting, juicy, and sweet. Ripens in mid-September. Very hardy, and a free bearer.

Elruge.—Fruit, roundish to oval. Size, medium. Colour, pale green and violet-red. Flavour, melting, juicy, rich, highly perfumed. Ripens in early September. An abundant bearer.

Hardwicke Seedling.—Fruit, roundish-oval. Size, large. Colour, pale green and purplish-red. Flavour, juicy and rich. Ripens end of August. A hardy and prolific variety.

Lord Napier.—Fruit, ovate. Size, large. Colour, yellowish-green, mottled with red. Flavour, very juicy and rich. Ripens in early August. A free cropper.

Victoria.—Fruit, roundish-oval and flattened. Size, large. Colour, greenish-yellow and crimson. Flavour, very juicy and rich. Ripens end of September. Requires a warm position.

Violette Hâtine.—Fruit, roundish. Size, medium. Colour, yellowish-green and purplish-red. Flavour, melting, juicy, and very rich. Ripens early in September.

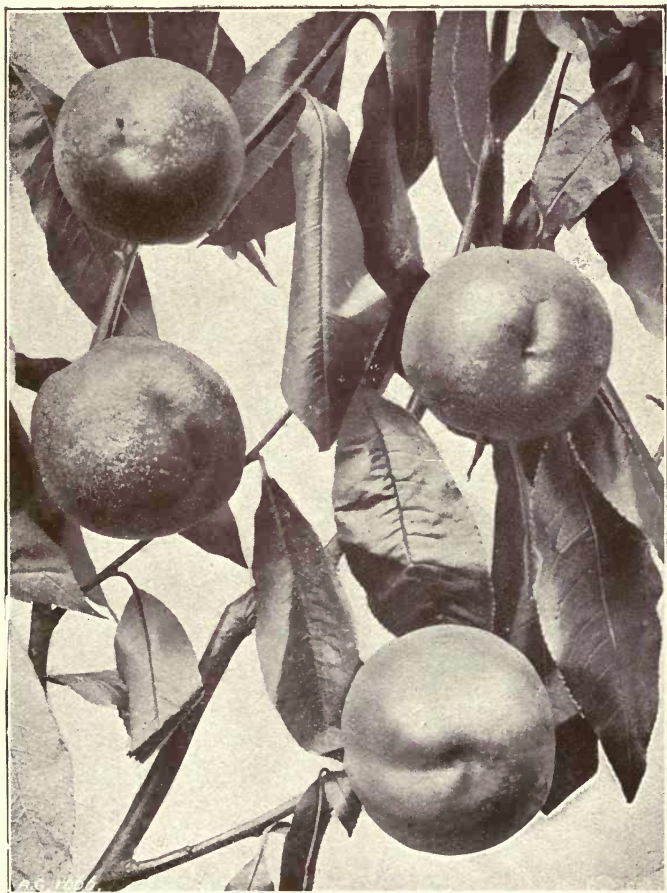
CHAPTER XIX.

The Pear.

THE PEAR (*Pyrus communis*) belongs to the same genus as the Apple, and is a native of this country, also of Temperate Europe and Western Asia. It was known to the ancient Greeks and Romans. Pliny, writing in the first century of the Christian era, remarks that Pears were then exceedingly numerous in Italy. It is more than probable, therefore, that the Romans introduced some of them into this country. No doubt, too, the monks cultivated Pears extensively in their monastic gardens and orchards. Pears were plentiful in the reign of King Edward I. (thirteenth century).

Gerarde, in the sixteenth century, says, to write of Pears and Apples grown in his day would require a volume. Parkinson also tells us that early in the next century Pears were as numerous as Apples, and that new varieties were constantly being introduced. He gives a list of sorts, some of which are grown at the present day. Among these the Windsor, Worster (Black Worcester), Gergonell (Jargonelle), and the Warden are described as being good sorts. Philip Miller, in his "Dictionary of Gardening," published in 1731, enumerates 80 varieties. A century later no less than 630 varieties were reputed to be grown in England; and at the Royal Horticultural Society's Conference in 1855, 616 varieties were exhibited.

The French gardeners were responsible for the introduction of the majority of the varieties, as they paid a good deal of attention to the culture and improvement of the Pear. Later the Belgian horticulturists interested themselves keenly in the subject, and many of the good sorts grown to-day are the outcome of their skill. Many distinguished British pomologists, as the late Thomas



NECTARINE, VIOLETTE HÂTIVE.

Season: August.



A.G. 254

A GOOD LATE PEACH, SEA EAGLE.
Season: Early October.

Andrew Knight, of Herefordshire, and Mr. Thomas Rivers, of Sawbridgeworth, have, however, also rendered yeoman service to pomology by rearing some excellent varieties of Pears.

For some centuries Pears have been largely grown in Worcestershire and Herefordshire for making a delicious

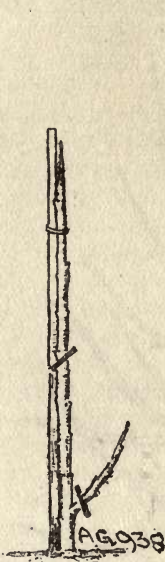


Fig. 50. A "MAIDEN" OR ONE-YEAR-OLD APPLE TREE.

The short bars indicate the amount of pruning to be given the tree the first winter to form it into a pyramid, bush, or espalier.

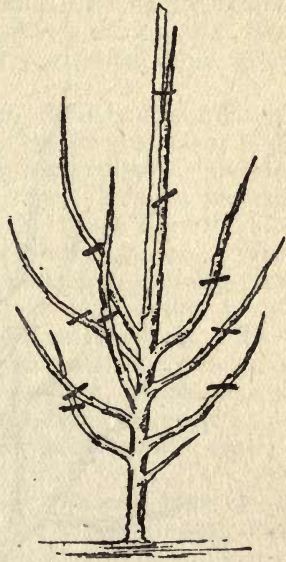


Fig. 51. A BUSH-TRAINED PEAR TREE.

The bars indicate where to prune the shoots in winter. As a result of the pruning an average of two young shoots will develop from each shortened shoot the following season.

beverage called perry. The favourite sorts for this purpose were the Barland and the Longland. The city of Worcester has three Pears as a part of its armorial bearings, so that it is evident the Pear was held in high esteem in the district in ancient times.

Propagation.—The Pear is increased by seeds, budding, and grafting. Rearing Pear trees from seed is seldom practised, excepting for yielding stocks for budding or

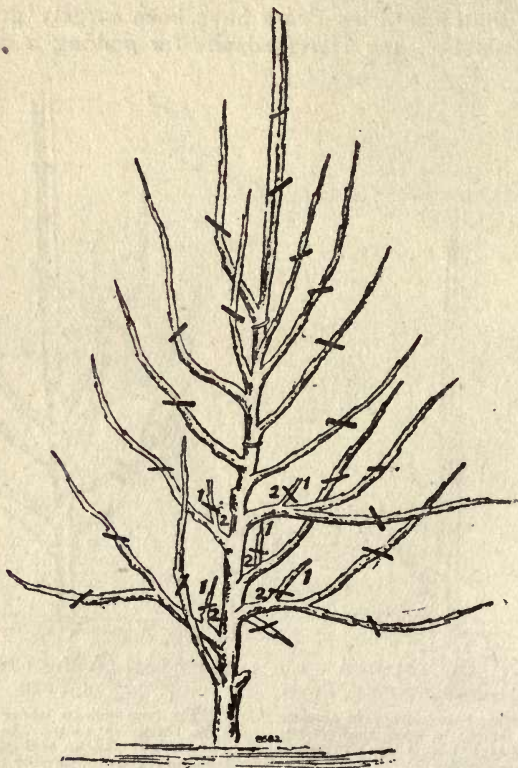


Fig. 52. A PYRAMIDAL-TRAINED PEAR TREE.

The short bars on the shoots show where to prune the shoots to in winter to ensure a good shaped tree.

grafting. The usual methods are budding and grafting. The former is carried out in July or August and the latter in March. See article on "Propagation," further on.

Stocks.—Two kinds of stocks are used for budding or grafting the cultivated varieties of the Pear. The first is the Seedling Pear, called a “free” stock, because it is of vigorous growth and deep-rooting. This stock is used for standards, pyramids, and espaliers that naturally attain a considerable size. Seeds for this purpose are obtained from France and America, the warmer climate ripening them better than is possible in this country. Seedling Pear stocks are also largely exported from France for budding or grafting.

The other stock is the Quince. This is of sturdier and slower growth than the Pear, has fibrous roots, which grow in a dense mass near the surface, and is therefore more shallow-rooting than the Pear. Being a moderate grower, it is used as a stock for Pears intended to be grown as cordons, bushes, or dwarf pyramids. Pears grafted on the Quince come early into bearing, commencing to bear fruit when two to three years old; whereas trees worked on the Pear or free stock do not begin to yield fruit until they are five or six years old. Moreover, Pears on the Quince thrive best on light, friable, or moist soils, make a more sturdy and compact growth, and hence are better suited for small gardens than those on the free stock.

All varieties, however, do not succeed well on the Quince. As a rule, it is the more robust-growing Pears that do best on this stock. But it is possible to grow the weaker sorts on the Quince by adopting the principle of double-grafting. Thus *Beurré Hardy*, *Beurré d’Amanlis*, and *Vicar of Winkfield* are strong-growing sorts which flourish on the Quince. These are permitted to grow for a couple of years, then they are pruned back to within 3in. or 4in. of the Quince stock, and such sorts as *Marie Louise*, *Josephine de Malines*, and *Knight’s Monarch*, which would do well directly on the Quince, are grafted on the stumps of the former sorts.

Three varieties of Quince are used—the Common, Angers, and the Portugal—but as a rule the Angers and

the Portugal have the preference. The Pear may be worked upon the Apple and also the Hawthorn, but not so successfully as on the Seedling Pear and the Quince.

Soil.—The Pear succeeds best in deep loamy soils, free from stagnant moisture. Trees worked on the Pear stock do not do well on shallow soils because of their deep-rooting propensity. Heavy clays require trenching 3ft. deep at least, and to have plenty of grit and decayed

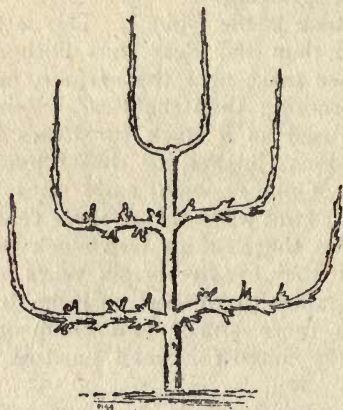


Fig. 53. A "PALMETTE VERRIER" TRAINED PEAR TREE.

This form of training is largely practiced in France and is a combination of the Espalier and Vertical forms of training. Suitable for lofty walls.

refuse added to render them porous. Pears on the Quince will thrive in any soil that is fairly rich and not too heavy.

Situation.—Standards grown in the open require a well-elevated but sheltered position. Owing to the trees coming early into leaf and blossom, both are liable to be injured by cold winds and frosts. In the North, and even in the Eastern Counties, Pears do not succeed satisfactorily in the open; they require the shelter of a wall.

Bushes, pyramids, and espaliers will do all right in gardens sheltered by hedges, fences, or walls. Early Pears may be grown on north and east walls; mid-season varieties on a west wall; and late ones on a south wall.

Forms of Trees.—Pears may be grown in a variety of ways, as standards (Fig. 10), half-standards, standard fan-trained, dwarf fan-trained, espaliers (Fig. 54), bushes, pyramids (Fig. 52), toasting-forks, pitch-forks palmette verriers (Fig. 53), vertical single cordons, oblique single cordons, double vertical cordons, double oblique cordons, and horizontal cordons. (Figs. 7, 8, and 9.)

Standards have stems 5ft. to 6ft. high, with branches at the apex. These are suitable for orchards or mixed plantations. Half-standards have stems 3ft. to 4ft. high, with branches at apex. Such trees are adapted for mixed plantations or large gardens. Standard fan-trained trees have stems about 4ft. high, with branches trained fan-wise; these are adapted for high walls. Dwarf fan-trained trees have short stems, with branches trained similarly to the last. These are suitable for walls 10ft. to 12ft. high. Espaliers have horizontal branches trained at right angles to the main stem and 1ft. apart on each side of the tree. Suitable for training to trellises in the open garden, or against walls. Bushes are dwarf, compact trees, worked on the Quince, and suitable for mixed plantations or small gardens. Pyramids have their branches trained cone-shaped, and they may be large, grafted on the Pear stock, or dwarf, worked on the Quince. "Toasting-forks" are trees trained with three vertical stems issuing from a short main stem, and furnished with fruiting spurs. "Pitch-forks" have two vertical stems issuing from a short main stem. Both suitable for walls. Palmette verriers have horizontal branches trained at right angles to each side of the main stem for some distance, then they are trained in a vertical position. Suitable for wall culture. Single cordons consist of one stem furnished with spurs, and they are either vertically or obliquely trained. Double cordons have two stems, and horizontal cordons are trees

with a main stem 1ft. high, with a single horizontal stem or two stems, one trained each way. The vertical and

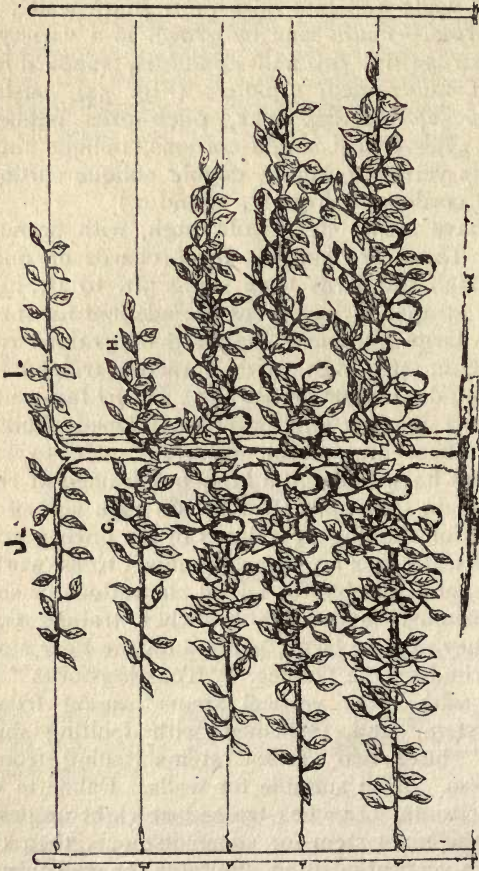


Fig. 54. AN ESPALIER-TRAINED PEAR TREE.

This form of tree is adapted for training to a wire trellis in the open garden or against lofty walls. Not suitable for low fences or walls.

oblique cordons are suitable for walls, trellises, or fences, and the horizontal cordons for growing as edgings to paths.

Espalier and fan-trained trees should never be planted against ordinary low walls or fences, as the latter are not high enough to allow for extension of growth. Oblique cordons are the best kind of tree for low walls or fences.

Distances for Planting.—Standards and half-standards, 30ft.; espaliers, fans, or palmette verriers, 15ft.; “toast-ing-forks,” 3ft.; “pitchforks,” 2ft.; bushes, 8ft.; pyramids, 10ft.; cordons, single, 18in.; ditto, double, 3ft.; horizontal cordons, single, 6ft.; double, 12ft.

Planting.—October and November are the best times to plant, but it may be done up to March in fine open weather. Never plant in wet weather. When the trees arrive examine the roots, and cut off any bruised portions. If the roots should be dry, soak them in water before planting. For standards, bushes, or pyramids, dig out holes about 4ft. to 5ft. wide, and stir up the soil to a depth of 3ft. Do not mix any manure with the soil. Leave a space about 6in. deep at the top, and on this spread out the roots of the tree; drive in a stout stake to support the stem; then cover the roots with fine mould, give a gentle shake to settle the soil, and add more mould and tread it down firmly. Continue thus till the tree is planted, then secure the stem loosely to the stake, and mulch with a layer of manure.

In the case of trees grown against walls, dig out holes 3ft. wide and 4ft. long. Break up the subsoil, and then plant as just advised. For cordons, dig the soil to a width of 3ft., and also to a depth of 3ft. Excavate the surface to a depth of 6in., place the trees in position, and fill up with soil, treading the latter firmly, and finishing off with a mulch of manure. Loosely secure the trees to the wall or fence. Observe the soil mark on each stem, and plant the roots so that the soil reaches this mark. At any rate, in the case of Pears grafted on the Quince, see that the top of the stocks is buried just below the surface of the soil.

Mode of Bearing.—The Pear, like the Apple, bears its fruit on naturally-formed spurs on the older wood; also



Fig. 55.

PEAR SHOOTS.

The left-hand shoot is furnished with fruit buds, that on the right with wood buds only.



Fig. 56. SUMMER PRUNING PEARS.

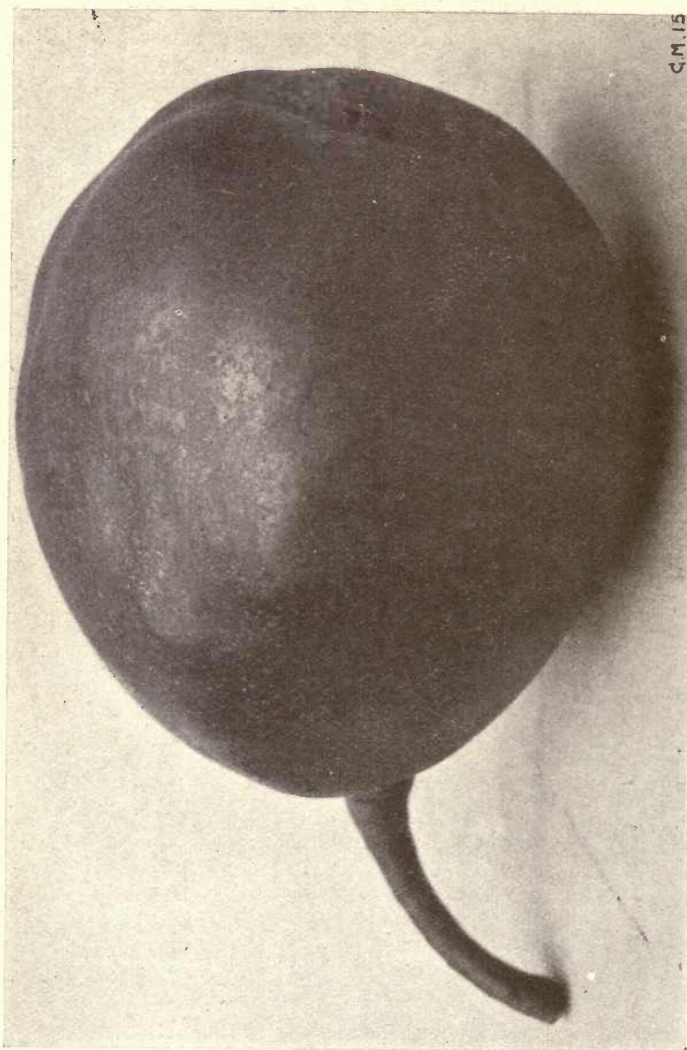
(k) Fruiting spurs, the result of summer and winter pruning. (l) Lateral shoot summer pruned to the fourth leaf, with fruit spurs at base. (m) Fruit buds. (n) A stubby shoot with fruit bud at apex. (o) Young shoot stopped to fourth leaf. (p) Leading shoot which does not require stopping unless it has filled its allotted space.

on those artificially created at the base of the previous year's shoots as the result of judicious summer and winter



PEAR, MARGUERITE MARILLAT.
Season: October.

C.M. 15



DESSERT PEAR, BEURRÉ SUPERFIN.

Season : September and October.

pruning. In the case of standard trees, fruit buds form freely at the extremities of the preceding season's growth. Thus it will be seen that if the shoots of such trees are not shortened, as is done in the case of dwarf trees, fruit



Fig. 57. A PYRAMIDAL PEAR TREE BEFORE PRUNING.

A healthy and promising young tree³



Fig. 58. A PYRAMIDAL PEAR TREE AFTER PRUNING.

Showing Fig 57 after it has been correctly pruned.

buds will form naturally on the last year's growth. Fruit buds are usually plump and fat-looking, whereas wood buds are slender and more or less pointed in shape. (Fig. 55.)

Summer Pruning.—This should be done in the manner and at the period described for the Apple (see Chapter 1.), as both require similar treatment. (Fig. 56.)

Winter Pruning.—The same remarks apply in this case. It would be a sheer waste of space to repeat the full and clear details already given for the Apple. See also the chapter on "Pruning and Training Fruit Trees," published further on in this volume. Particular attention should be paid to thinning out the fruiting spurs on old trees. Too often such trees have their spurs so overcrowded that fruit fails to set freely, although there may be a plethora of blossom. By judiciously thinning out the spurs, more light and air can have access to them, and the blossoms, in consequence, develop more strongly and fruit trees sets more freely. (See Figs. 57 and 58.)

Lifting and Root Pruning.—In the case of cordon trees grown against walls or fences, that are making too much wood and fruiting too sparsely, it is desirable in October to lift them carefully, shorten moderately any very strong roots, reserving the compact, fibrous ones, and then replanting. This removal and shortening of the roots checks the tendency to gross growth, and encourages fruit buds to form more freely. No amount of summer and winter pruning will make a tree fruitful unless the roots are also pruned to maintain a proportionate balance between root and branch.

Bush and pyramid trees, also espalier and wall-trained trees, if making excessive growth, would be greatly benefited by lifting and root-pruning. When such trees, however, are more than six or seven years old, lifting is attended with a certain amount of risk. In such a case root-pruning only should be practised. Cordons should be lifted and replanted every third year to keep rank growth in check and promote fruitfulness. See chapter on "Pruning" for further details *re* root-pruning.

Manuring Pear Trees.—Trees grown against walls or fences, or as bushes or pyramids in the open, and bearing

heavy crops of fruit, will be greatly benefited by frequent applications of liquid manure; also by a mulching of rotten manure. The latter applies specially to cordon trees. Copious waterings in dry weather should also be given. For other manures, see chapter further on.

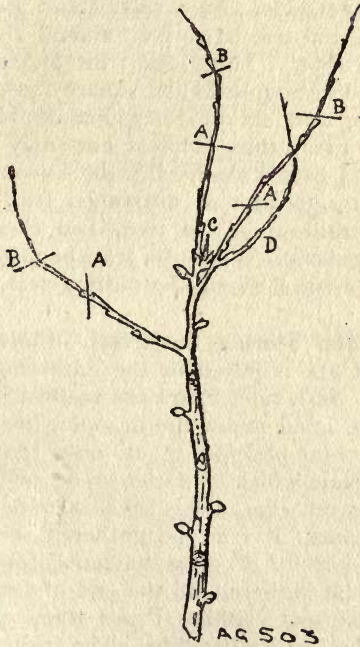


Fig. 59. A PEAR SHOOT.

If wood is well ripened shorten to *B*; if not, then to *A*.
D. Cut away or shorten to two buds.

General Details.—Where trees are grown on walls or fences exposed to cold winds, it is advisable to protect the blossom by means of a double or triple layer of old fish-netting or tiffany, laid over poles or spars of wood placed in a slightly slanting position against the wall or

fence. This will break the force of the winds, and also ward off any sharp frosts that may occur when the trees are in blossom. Remove the coverings as soon as the fruit has set.

If the fruits set very freely, it will be wise to thin them out, removing the smallest. This is especially necessary in the case of cordons. As a rule, about six small, three medium-sized, and one large fruit should only be allowed to the square foot. Thus, one fruit of, say, Fitmaston Duchess would be ample to the square foot, and three of Louise Bonne, and six of Josephine de Malines to the same area. Fruit thus thinned not only develops of larger size and better shape, but the flavour also is of a superior quality to that of unthinned fruit. Besides, it lessens the strain upon the tree, and encourages it to fruit more regularly. When the fruit begins to ripen, any leaves which shade it should be pushed aside.

Gathering and Storing the Fruit.—Considerable care and judgment are required in the gathering and storing of the fruit. As a rule, Pears are ready to gather when, on placing the hand under the drooping fruit and raising it to a horizontal position, it at once parts from the branch. A fruit which requires to be pulled or twisted off by force is not ripe, nor is its proper flavour fully developed. Besides, if fruit be gathered too soon it will shrivel, and not be of good flavour. The latest sorts ought not to be gathered till the end of October or early part of November. Gather Pears when quite dry, and take care not to bruise the skin. The fruit may be stored in a single layer on shelves in the fruit or other dark cool room, where there is a steady temperature of 40 deg. Or it may be placed in single layers in shallow boxes fitted with a lid, or in a drawer. To hasten the ripening of any variety, bury the fruit in bran in a box; or place it in clean straw in a basket, and store in a warm room for a week or so. It is important that light be excluded from the fruit.

Pests.—The larvæ of the Winter, Mottled Umber, Lackey, and Pear-leaf Blister Moths attack the foliage; the grubs of the Leopard and Goat Moth the wood; the Fruit Bark Beetle the bark; Apple Blossom Weevil the flowers; Apple Sawfly and the Pear Midge the fruit; American Blight the shoots; Social Pearfly, Aphides, Pear Thrips, and the Pear Blister Mite, the foliage of the Pear.

Diseases.—The Pear-leaf Blister and Pear-leaf Cluster Cups attack the foliage, and the Pear Scab the foliage and the fruit. See chapter on "Pests," etc.

Varieties for Dessert.

We will now describe fifty of the most popular Pears in cultivation. This selection will meet the requirements of most gardens; but if more varieties are needed, then recourse must be had to nursery catalogues.

Beurré Alexandre Lucas.—A delicious Pear, hardy and free-bearing. Fruit, medium, obovate. Colour, yellow, dotted with russet. Flavour, melting and juicy. Season, November.

Beurré d'Amanlis.—A free grower and bearer. Fruit large, pyriform. Colour, green, crimson cheek. Flavour, juicy, rich. Season, September. Self-sterile.

Beurré Bachelier.—A good hardy sort and free bearer. Fruit, large, obovate. Colour, greenish-yellow, dotted russet. Flavour, buttery, melting rich. Season, December.

Beurré Clairgeau.—A very showy Pear. Does well as a standard. Requires double-grafting if grown as a dwarf on Quince. Fruit, large, pyriform. Colour, yellow and bright red. Flavour, melting, rich, perfumed. Season, November.

Beurré Diel.—Hardy, vigorous grower and free bearer. Fruit, very large, obovate. Colour, greenish-yellow,

marked with russet. Flavour, juicy and pleasant. Season, October and November. Self-sterile.

Beurré Hardy.—A popular Pear for pyramid culture. Fruit, large, obovate. Colour, brown, shading to golden-yellow. Flavour, melting, juicy, rich, and refreshing. Season, October.

Beurré Rance.—A good late Pear, suitable for a north wall. Fruit, large, pyriform. Colour, green, spotted with russet. Flavour, rich, melting, juicy. Season, December to March.

Beurré Superfin.—A very fine, free-bearing Pear. Fruit, large, obovate. Colour, greenish-yellow, veined with russet. Flavour, buttery, melting, juicy. Season, September to October. Self-sterile.

Brown Beurré.—A good-flavoured Pear. Fruit, large, obovate. Colour, green and reddish-brown. Flavour, melting and buttery. Season, October. Succeeds best double-grafted.

Chaumontel.—A hardy, free-bearing Pear. Fruit, large, pyriform. Colour, yellowish-green and brownish-red. Flavour, buttery, juicy, and rich. Season, November to March. Does well as a standard.

Comte de Lamy.—One of the best dessert Pears in cultivation. An immense cropper. Fruit, small, roundish-obovate. Colour, yellowish-green and brownish-red. Flavour, buttery, melting, and sugary. Season, October.

Conference.—A popular and handsome Pear. Free cropper. Fruit, large, pyriform. Colour, green, orange, dotted with russet. Flavour, melting, rich, aromatic. Season, October. Fine for dwarfs, cordons, etc. Self-fertile.

Doyenné Bussoch.—A very fine Pear. Free bearer. Fruit, very large, roundish-obovate. Colour, lemon-yellow, dotted with russet. Flavour, melting, juicy, rich, and aromatic. Season October.

Doyenné du Comice.—An exceptionally good Pear. Fruit, large, obovate. Colour, yellow, tinted with russet. Flavour, rich and delicious. Season, October and November.

Duchesse d'Angoulême.—A vigorous-growing and free-bearing variety. Fruit, very large, roundish-obovate. Colour, yellow, freckled with russet. Flavour, rich, juicy, melting, and sweet. Season, October and November.

Durondeau.—An excellent Pear for walls or bushes. A regular and free bearer. Fruit, large, pyriform. Colour, yellow, blushed crimson on sunny side. Flavour, very rich. Season, October. Self-fertile.

Easter Beurré.—A good hardy, free-bearing Pear. Fruit, large, obovate. Colour, pale green, with reddish cheek. Flavour, buttery, rich, and juicy. Season, January to March. Best double-grafted. Self-sterile.

Emile d'Heyst.—An abundant bearer, whether grown as a dwarf or a standard. Fruit, medium, pyriform. Colour, yellow, veined with cinnamon-russet. Flavour, buttery, melting, and juicy. Season, late October. Self-fertile.

Fertility.—A variety largely grown for market. Free cropper. Fruit, medium, obovate. Colour, greenish, tinted reddish-brown. Flavour, juicy, sweet, and aromatic. Season, September and October.

Fondante d'Automne.—A good, free-bearing autumn Pear. Fruit, medium, obovate. Colour, pale yellow and russet. Flavour, sweet, refreshing, delicately perfumed. Season, September and October.

Gansel's Bergamot.—A good kind to grow as a cordon or espalier on walls. Requires to be double-grafted. Fruit, medium, roundish-obovate. Colour, yellow, tinted red. Flavour, rich, musky. Season, October and November.

General Todleben.—Hardy and free-bearing. Fruit, very large, pyriform. Colour, yellow and russet. Flavour,

juicy, rich, and aromatic. Season, October and November.

Glou Morceau.—A good Pear for seaside gardens or walls in inland districts. Fruit, large, roundish or obovate. Colour, yellow and russet. Flavour, buttery, rich, aromatic. Season, December to January.

Jargonelle.—A fine old Pear, which does well on walls and as a standard. A good bearer. Fruit, large, pyriform. Colour, greenish-yellow, tinged with brownish-red. Flavour, melting, juicy, rich. Season, August and September. Self-sterile.

Jersey Gratioli.—A prolific variety grown as a standard, or as a pyramid or cordon. Fruit, medium, roundish-obovate. Colour, yellow, brown, and russet. Flavour, melting and vinous. Season, October.

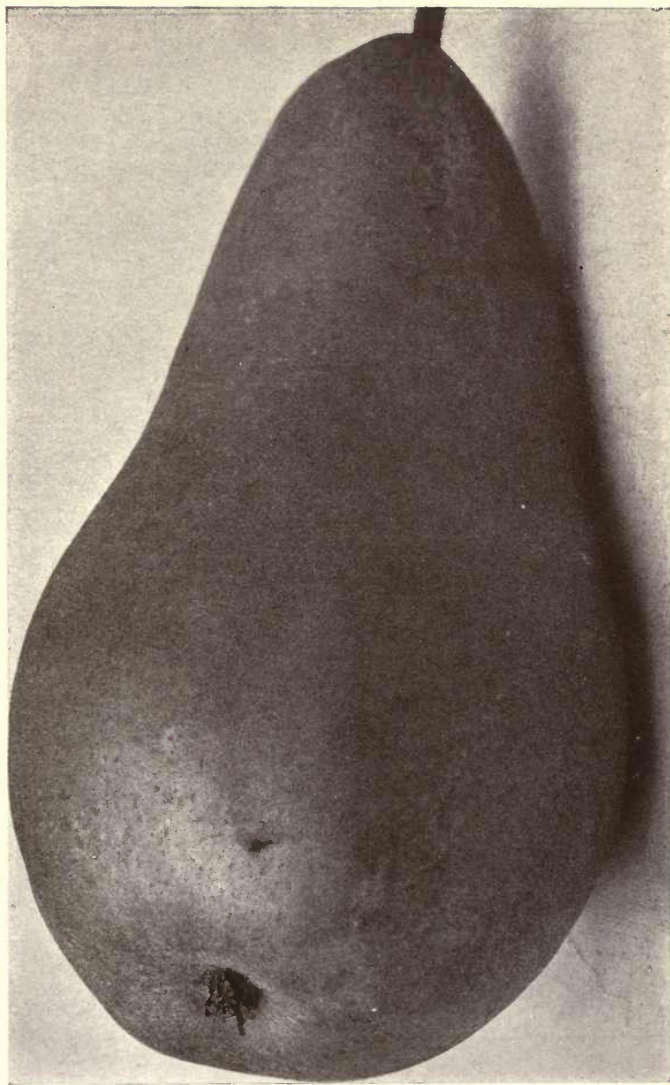
Joséphine de Malines.—A first-rate Pear, doing well as a standard, or double-grafted on the Quince. A prolific bearer. Colour, yellow, green, and russet. Flavour, juicy, rich. Season, January to April. Self-sterile.

Knight's Monarch.—A fine-flavoured Pear. Hardy and free-bearing when double-grafted. Fruit, medium, roundish. Colour, yellowish-green and russet. Flavour, juicy, rich, aromatic. Season, November to February.

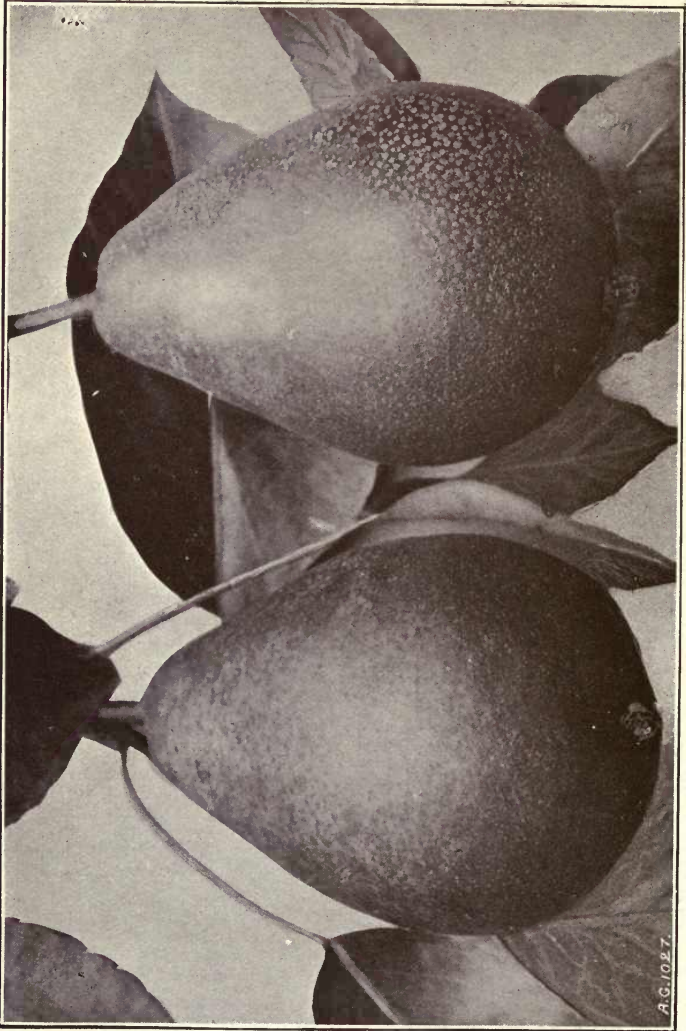
Louise Bonne of Jersey.—A very handsome Pear, one of the best. Most prolific. Fruit, large, pyriform. Colour, yellow, crimson, and russet. Flavour, sweet, rich, and melting. Season, October. Self-sterile.

Madame Treyve.—A high-quality Pear. Prolific. Fruit, large, obovate. Colour, yellow and bright crimson. Flavour, melting, juicy, rich. Season, September.

March Bergamot.—A hardy, free-bearing Pear. Fruit, medium-sized, roundish. Colour, brown and russet. Flavour, very rich, aromatic. Season, February to March.



DESSERT PEAR, TRIOMPHE DE VIENNE.
Season : September.



DESERT PEAR, FERTILITY.
Season : September and October.

A.G. 1027.

Maréchal de Cour.—A free-bearing and hardy Pear. Fruit, large, pyriform. Colour, yellow and cinnamon-russet. Flavour, melting, rich. Season, October and November.

Marguerite Marillat.—A prolific and hardy Pear. Fruit, large, pyriform. Colour, pale orange, tinged with red. Flavour, rich, juicy, and aromatic. Season, October.

Marie Benoist.—A prolific Pear when double-grafted on the Quince. Fruit, large, roundish. Colour, yellow and russety. Flavour, juicy, sweet, melting. Season, November to January.

Marie Louise.—A favourite Pear. Does well as a standard, or double-grafted on the Quince stock. Fruit, large, pyriform. Colour, golden, russety. Flavour, buttery, melting, rich. Season, October and November. Self-sterile.

Nec Plus Meuris.—A good Pear, that does best on a south wall. Fruit, medium-sized, turbinate. Colour, yellow and russety. Flavour, buttery, rich, vinous. Season, January to March. Should be double-grafted on the Quince.

Nouvelle Fulvie.—A suitable Pear for a warm wall. Fruit, medium-sized, pyriform. Colour, yellow and russet, tinted red. Flavour, juicy and rich. Season, November to February.

Olivier de Serres.—An excellent late Pear. Does well as a cordon. Fruit, medium-sized, roundish. Colour, yellowish and russety. Flavour, buttery, very rich. Season, February and March. Do not gather till November. Self-sterile.

Passé Colmar.—A hardy, free-bearing Pear. Fruit, medium-sized, obovate. Colour, pale yellow, reddish. Flavour, juicy, melting, rich. Season, November and December.

Pitmaston Duchess.—One of the largest Pears, individual fruits often weighing $1\frac{1}{2}$ lb. each. Fruit, extra large, pyriform. Colour, pale lemon-yellow. Flavour, juicy, melting, rich. Season, October and November. Double-graft if to be grown on the Quince. Self-sterile.

Princess.—A handsome and prolific Pear. Free bearer. Fruit, large, pyriform. Colour, yellow, flushed crimson. Flavour, melting, sweet, and pleasant. Season, October and December.

Seckle.—An American Pear, but a free bearer and good-flavoured variety. Fruit, small, obovate. Colour, mahogany-red, with silvery spots. Flavour, very juicy and aromatic. Season, October. If grown on the Quince should be double-grafted.

Souvenir du Congrès.—A good early Pear. Free bearer. Fruit, large, pyriform. Colour, yellow, crimson, and russet. Flavour, melting, juicy, aromatic. Season, August and September. Requires to be double-grafted if grown on the Quince. Self-sterile.

Summer Doyenné (Doyenné d'Été).—A very early Pear. Free bearer. Fruit, small, roundish. Colour, yellow, tinted red. Flavour, juicy, sweet, and pleasant. Season, early August.

Thompson's.—A Pear of excellent merit. Fruit, medium-sized, pyriform. Colour, yellow, dotted with russet. Flavour, melting, juicy, and aromatic. Season, November.

Triomphe de Vienne.—A handsome early Pear. Fruit, very large, pyriform. Colour, yellowish, russety. Flavour, melting, juicy, rich. Season, September.

Urbaniste.—A hardy and prolific Pear. Should be double-grafted if grown on the Quince. Fruit, medium-sized, obovate. Colour, yellow, russet, and red. Flavour, melting, rich, sweet, and aromatic. Season, October.

Van Mons. Léon Leclerc.—A very handsome Pear. Requires to be double-grafted if grown on the Quince. Fruit, large, pyriform. Colour, yellow, russet, and red. Flavour, juicy, rich. Season, November.

Williams' Bon Chrétien.—One of the most popular early Pears in cultivation. Very prolific grown on the Quince stock. Fruit, large, pyriform. Colour, yellow, streaked with red. Flavour, buttery, melting, juicy, rich. Season, August and September. Self-sterile.

Winter Nelis.—A first-rate winter Pear. Fruit, small, roundish. Colour, greenish-yellow and russet. Flavour, rich, melting, with a pleasing aroma. Season, November to February.

Zéphirin Grégoire.—A good bearer on the Quince stock. Fruit, medium-sized, roundish. Colour, yellow and russet. Flavour, juicy and vinous. Season, December to January.

Cooking Pears.

The following sorts are suitable kinds to grow for baking or stewing:

Bellissime d'Hiver.—Fruit, very large, roundish. Colour, yellowish-brown, tinged with vermilion. Flavour, sweet, musky. Season, November to April. May be grown as a standard on the Pear or as a dwarf on the Quince stock.

Black Worcester, or Warden Pear.—Fruit, very large, obovate. Colour, green and brown, tinted with red. Flavour, good. Season, November to February. Best grown as a standard.

Catillac.—One of the best cooking Pears. A prolific cropper as a standard or as a dwarf on the Quince. Fruit, very large, roundish. Colour, greenish, tinted red. Flavour, crisp and musky. Season, December to April.

Uvedale's St. Germain.—The largest Pear in cultivation, single fruits weighing as much as 2lb. to 3lb. each. Fruit, extra large, pyriform. Colour, yellowish-green, tinged with red. Flavour, juicy, sweet, and pleasant. Season, January to April. Does well double-grafted on the Quince stock.

Verulam.—A hardy grower and free bearer. Suitable for standards, or dwarfs on the Quince. Fruit, large, obovate. Colour, green, russet, and reddish-brown. Flavour, rich. Season, December to March.

Vicar of Winkfield.—A prolific Pear as a pyramid, espalier, or standard. Fruit, large, pyriform. Colour, yellow, tinted with red. Flavour, juicy and aromatic. Season, November to January.

Varieties for Cordon Culture.

The following sorts, grafted on the Quince stock, are suitable for culture as vertical or oblique or horizontal cordons against walls or in the open: Beurré d'Amanlis, Beurré Bachelier, Beurré Clairgeau, Beurré Diel, Beurré Hardy, Beurré Sterckmans, Beurré Superfin, Brown Beurré, Comte de Lamy, Doyenné Bussoch, Doyenné du Comice, Fondante d'Automne, Gansel's Bergamot, General Todleben, Glou Morceau, Jargonelle, Jersey Gratioli, Joséphine de Malines, Knight's Monarch, Louise Bonne of Jersey, Madame Treyve, Marie Benoist, Marie Louise, Pitmaston Duchess, Souvenir du Congrès, Summer Doyenné, Thompson's, Olivier de Serres, Van Mons. Léon Leclerc, Winter Nelis, Williams's Bon Chrétien, Triomphe de Vienne, Zéphirin Grégoire, Urbaniste, Nec Plus Meuris, and Easter Beurré.

Varieties for Bush or Pyramid Culture.

All the foregoing varieties, with the addition of Conference, Durondeau, Duchess d'Angoulême, Emile d'Heyst, Princess, and Seckle. All to be grafted on the Quince stock.

Varieties for Culture on Walls.

The following sorts to be grown as espaliers, fans, gridirons, "toasting-forks," or "hay-forks" on walls: (1) for a south, south-east, or south-west wall—Beurré Rance, Beurré Sterckman, Beurré Superfin, Brown Beurré Doyenné du Comice, Gansel's Bergamot, Glou Morceau, Jargonelle, Knight's Monarch, Marie Louise, Olivier de Serres, and Pitmaston Duchess; (2) for easterly or westerly aspects—Beurré Superfin, Doyenné du Comice, Emile d'Heyst, Durondeau, Fondante d'Automne, Glou Morceau, Joséphine de Malines, Louise Bonne of Jersey, Maréchal de Cour, Thompson's, Winter Nelis, and General Todleben.

Varieties for Standards.

The following are suitable to grow as standards or half-standards on the Pear stock: Beurré Hardy, Beurré Clairgeau, Durondeau, Emile d'Heyst, Fertility, Fondante d'Automne, Jargonelle, March Bergamot, Marie Louise, Louise Bonne of Jersey, Princess, and Williams's Bon Chrétien.

Six Hardest Varieties.—Beurré d'Amanlis, Comte de Lamy, Emile d'Heyst, Jargonelle, Louise Bonne of Jersey, Williams's Bon Chrétien.

Largest Pear.—Uvedale's St. Germain.

Varieties for the North.—The following will succeed grown as bushes, espaliers, or pyramids in the North, including Scotland: Beurré d'Amanlis, Doyenné du Comice, Beurré Hardy, Louise Bonne of Jersey, Marie Louise, Thompson's, Souvenir du Congrès, Triomphe de Vienne, Beurré Superfin, Joséphine de Malines, Le Lectier, and Pitmaston Duchess.

CHAPTER XX.

The Plum.

THE PLUM belongs to the same genus as the Apricot, Cherry, Peach, and Nectarine—namely, the *Prunus*. Bentham and Hooker, in their “British Flora,” class the Plum, Damson, Sloe, and Bullace as forms of the Wild Plum (*Prunus communis*); but others consider them to belong to another species—domestica. Whatever the origin of the Plum, it has certainly been grown for many centuries past in this country. Long prior to that, Plums were cultivated by the Grecians and Romans. Pliny says they were first brought from Syria into Greece, and from thence into Italy. From Italy the best varieties found their way into France, and thence into England.

Gerarde, the sixteenth century writer, remarks in his “Herbal” that in his day “to write about Plums particularly would require a peculiar volume”; and Parkinson, in the early part of the next century, describes sixty varieties as being grown in gardens. The well-known Green Gage Plum was introduced here from France by a person named Gage, and it has since become the parent of many fine varieties. In France it is known as the *Reine Claude*, this name being applied to the variety in honour of the queen of Francis I., who introduced the variety into France from Italy. The Orleans Plum is reputed to have been introduced into England in the reign of Henry V.

The precise date of the introduction of the cultivated Plum into Britain is not known. During the last century many new varieties were introduced, and the cultivation of the Plum greatly extended on walls, in the garden, and in the orchard.

The fruit is most delicious for eating in a raw state for dessert, for cooking in tarts, or by itself; also for jam-making, bottling, etc. Immense quantities of fruit are annually imported in a dry state under the name of "prunes" from France, Germany, and California. Green Gages, too, packed in dainty boxes, reach us from France early in the season; and of late years we get large importations of ripe fruit from South Africa. But, as we are concerned more in this volume with the growth of Plums in gardens, we need not enlarge further on the latter subject. See also chapter on the "Bullace and Damson."

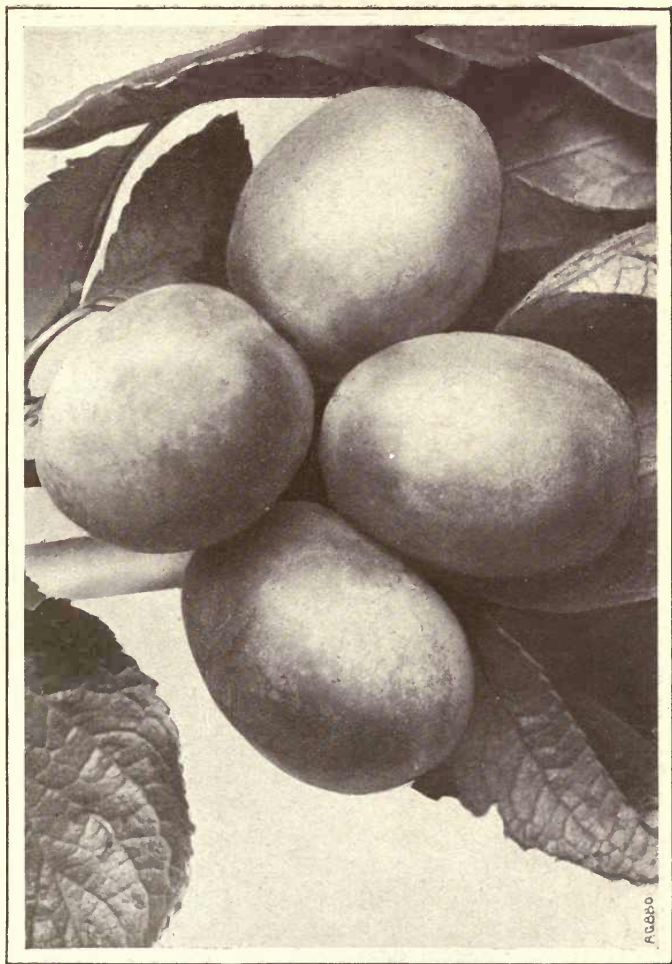
In recent years some attention has been paid to Japanese Plums, but so far they have only been grown under glass. Messrs. Bunyard and Co. describe some half-dozen varieties in their catalogue, and incidentally mention that one variety, the Burbank, has fruited in their Maidstone Nurseries. They are reputed to be very fertile, and to yield fruit of good quality. Still, as we have so many excellent sorts in cultivation, there is but little need to trouble about the Japanese kinds.

Propagation.—The usual and best method is by budding in July. Grafting by the whip or cleft method is sometimes practised, but it is not a satisfactory plan, as there is a risk of gumming occurring at the point of union. Really budding is the better plan of the two. The Plum is readily reared from seed by sowing stones taken from perfectly ripe fruit, and burying them 3in. apart in drills 3in. deep and 1ft. asunder. As, however, seedlings rarely produce varieties of any merit, this plan is only worth practising for rearing plants for stocks. Suckers should be avoided in any case, as they would be liable to be continually throwing up further suckers from their roots. Layering is a simple process, and consists of pegging down to, and partly burying in, the soil any healthy shoots. Such trees are, however, not so good as those increased by budding. See chapter on "Propagation."

Stocks.—Those used for the Plum are the Mussel, St. Julien, White Pear Plum, and the Myrobalan Plum. The Mussel Plum is the kind chiefly used for standard trees, and the others for pyramids, bushes, fans, and cordons. All may be reared from seed; indeed, this is the most satisfactory way of rearing stocks, as they are less liable to produce suckers than stocks reared from layers. All stocks, whether the trees are to be grown as standards or dwarfs, should be budded about 6in. from the ground. In the case of standards, the shoot produced from the scion should be trained upwards to form the stem. The amateur will find, if he uses the Mussel as a stock for standard Plums, and the St. Julien for dwarf Plums, he will not go far wrong. The late Mr. D. T. Fish recommended the use of seedling Green Gages as stocks for dwarf Plums. The Common Green Gage is readily reared from seed, and, as it is of moderate growth, it would, no doubt, have a dwarfing influence upon any Plum worked upon it.

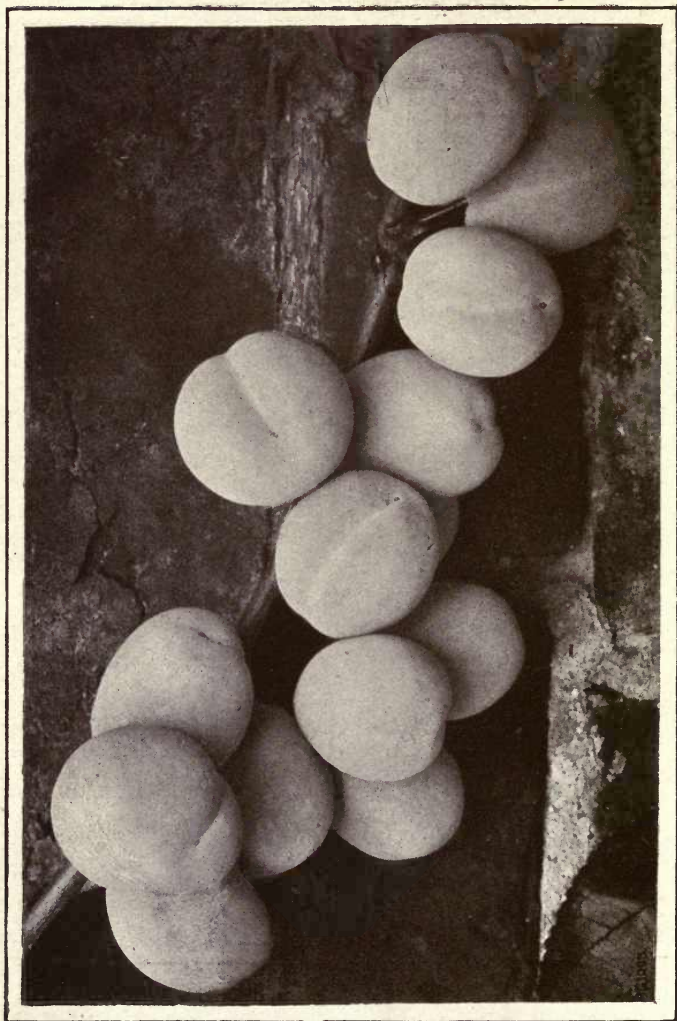
Soil.—The Plum is a surface-rooting tree, therefore does not require a great depth of soil. Sandy, gravelly, or heavy clay soils are not suitable. A medium soil, free from stagnant moisture, suits the growth of the Plum better than a light or a very heavy one. Where sandy or gravelly soils exist, dig out the soil to a depth of 2ft., and replace it with a good heavy loam. On no account mix manure with it. Should the soil be clay, trench 3ft. deep, and mix grit and light soil freely with it to lighten it. In all cases dig deeply before planting. It is well, too, where soils do not naturally contain lime, to apply 1lb. of fresh lime per square yard before planting. Soils that have been heavily manured are not good for Plums; they encourage a rank, unfruitful growth; therefore should be well limed to sweeten and improve their condition.

Situation.—Plums require plenty of light and air, and a fairly well-elevated site. Low-lying, damp positions are quite unsuitable. The choicer dessert varieties, including



CULINARY PLUM, VICTORIA.
Season : Early September.

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CULINARY PLUM, AUTUMN COMPOTE.

Season: September.

the Gages, are best grown against walls. Culinary varieties may be grown on walls or fences facing north, and Gages for a successional supply; also such first-rate kinds as Kirke's, Jefferson's, Coe's Golden Drop, etc., on a wall facing east.

Forms of Trees.—Plums may be grown as standards in orchards, as half-standards, bushes, or pyramids in the open garden; or as standard fan-trained, dwarf fan-

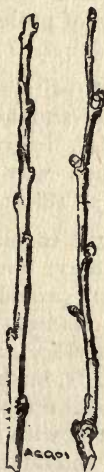


Fig. 60. PLUM SHOOTS.

Both shoots are of one year's growth. That on the right is furnished with fruit buds; that on the left with wood buds only.

trained, dwarf horizontally-trained, and cordon-trained for walls. Standards have stems 6ft. high, and half-standards 3ft. high. Bushes and pyramids have a clear main stem about 1ft. high, above which branches radiate, these being kept trained into shape by summer and winter pruning. Fan-trained standards are similar to ordinary standards in length of stem, but have their branches trained fan

shape. They are suitable for walls 14ft. high and upwards. Dwarf fan-trained trees have short stems (1ft.), with branches spread out equally each way. These are adapted for walls 8ft. to 10ft. high. Horizontally-trained trees are also suitable for a similar purpose. Cordons may be of the upright or oblique form, with a single main stem furnished with spurs; double-stemmed; or horizontal. The upright and oblique cordons are suitable for walls or fences 5ft. to 6ft. high and upwards, or for arches or trellises in the open garden. Bushes and pyramids may also be grown by the side of paths, or in quarters or plots by themselves.

Distances for Planting.—Standards should be planted 21ft. apart each way; half-standards, 12ft. apart in rows 15ft. asunder; bushes, 6ft. apart in rows 9ft. asunder; pyramids, 10ft. apart each way; fan-trained standards, 36ft. apart; ditto, dwarfs, 18ft.; cordons, 18in. apart.

Planting.—The best time to plant is from mid-October to December. Planting may, however, be done any time from then up to March, provided the weather be fine. Deep planting must be avoided. Plant so that the roots are fairly close to the surface, and see that the soil is made quite firm. Standards, bushes, and pyramids should be supported by a stout stake firmly driven in the ground before the roots are covered with soil. Those to be grown against walls or fences should only be loosely secured; indeed, the same precaution is essential in the preceding case. See that the roots are spread out their full length, that they are made moist before planting, and that all bruised parts are cut away. After planting is completed, top-dress with a layer of well-rotted manure. We should add here that, in the case of standards and pyramids, circular holes 3ft. to 4ft. wide for each tree should be dug out prior to planting. For wall trees the holes should be 3ft. wide, to allow ample room for the roots to be spread out their full length. Do not overlook the importance of firm planting, as Plums dislike a loose soil.

Mode of Bearing.—The Plum bears its fruit on spurs formed on the old wood; also on the shoots of the preceding year's growth. The spurs may be of natural formation or be artificially formed by shortening lateral growths to four leaves the previous summer. Spurs are clusters of fat plump buds, the latter being easily distinguished from wood buds, which are small and thin.



Fig. 61. PLUM SHOOTS.

The shoot on the right is of one year's growth and with wood buds only. On the left is a two-year-old shoot furnished with fruiting spurs.



Fig. 62. EFFECT OF SUMMER PRUNING A PLUM SHOOT.

Result, the formation of fruit buds.

Blossom buds are also borne at intervals along the preceding year's growth, sometimes close to the tip. In pruning, therefore, it is essential when shortening a shoot to take care not to cut back to a plump flower bud, but to a thin, small wood bud. (Figs. 60 and 61.)

Disbudding.—This operation applies to trees trained to walls only, and is usually performed in early sum-

mer, as soon as the new growth begins to develop. It consists of rubbing off with the finger and thumb all foreright shoots—i.e., those that grow out of the front of the branches; also any weak growths not required to form future spurs or new branches for extend-



Fig. 63. PRUNING PLUM SHOOTS.

Prune the previous Summer's growth to A (third bud) to form a fruiting spur. The second figure represents a shoot furnished with fruit spurs and which needs no pruning.

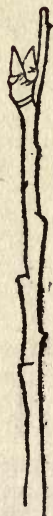


Fig. 64 A WORTHLESS PLUM SHOOT.

Shoots like above, which have buds on at the apex, should be cut clean away.

ing the size of the tree. This timely removal of superfluous growth concentrates the energies of the tree upon the development of the right kind of shoots, and finer specimens of fruit.

Summer Pruning.—The chief point to observe in the pruning of trees trained to walls is to keep them well furnished with young wood. Thus each branch should have a leading shoot, with laterals on each side. Now a sufficient number of the latter should be allowed to grow unchecked if there is room for them to be trained in to the wall. Generally speaking, the shoots ought not to be less than 1ft.

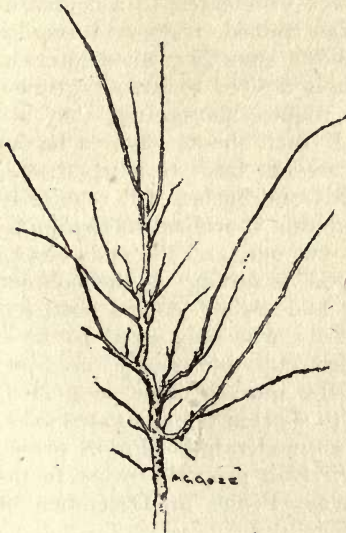


Fig. 65. A PYRAMID OR BUSH PLUM TREE BEFORE PRUNING.

The tree is a young one and has made unusually vigorous growth. The shoots should have been summer pruned.



Fig. 66. A PYRAMID PLUM TREE AFTER PRUNING.

The same tree as shown in Fig. 65 after it has been judiciously winter pruned.

apart. If more numerous, then shorten all lateral shoots in August to four leaves to form spurs, but do not interfere with the leading or terminal ones. Bushes and pyramids require lateral growths only to be shortened to the fifth leaf. Cordons require all their lateral or side growths to be shortened to five leaves in mid-August, allowing the

leaders only to grow unchecked. Standards, if growing very vigorously, should have the points of their strong leading growths pinched off at above period, but no summer pruning otherwise will be needed. (Fig. 62.)

Winter Pruning.—Plums do not require much winter pruning if disbudding and summer pruning have been properly carried out. In the case of cordons, shorten the laterals that were pinched back in summer to a couple of buds from their base. Fan-trained trees will require similar treatment as regards the summer-pruned laterals. The leading shoots, unless it is desired to encourage new laterals to develop, will not require shortening; they are best left their full length. If such shoots have to be cut back, always see that they are cut back to a wood bud, not to a fruit bud. Pyramids and bushes will require to have their summer-pruned laterals shortened to two buds, any weak or sickly branches cut out, and the ends of any extra strong leaders shortened according as the contour of the tree demands. Short and stubby leaders need not be interfered with. Standards will only need to have overcrowded branches thinned out and sickly ones removed. After a few years the spurs become congested. It is, therefore, a good plan to shorten the elongated ones, and thin out the crowded ones moderately. Plums grown on walls often fail to set their fruit properly owing to the overcrowding of the spurs. Prune in December or January. (Figs. 63 to 66.)

Root Pruning.—Cordons, wall trees, bushes, and small bushes are greatly benefited by careful lifting, moderate root-pruning, and replanting. Trees growing in rich soils are very liable to grow too freely, and produce too little fruit; therefore, if such trees are lifted every third year or so, and any extra vigorous roots moderately shortened, they will be made fruitful. Indeed, this system is essential to ensure Plum trees bearing freely in the earlier period of their existence. Let it be clearly borne in mind that lifting and root-pruning are only beneficial in the case

of trees that are growing vigorously. It must not be regarded as a remedy for unfruitfulness due to other causes. The best time to lift and root-prune is in October.

General Cultural Details.—The chief points to observe, in addition to those previously dealt with, are to keep all suckers removed, tracing them to their source, and cutting them off close to the root. Trees grown in dry borders against walls should have a wide mulching of manure placed at their base in early summer, and copious waterings given in very dry weather. Artificial and liquid manures will also be beneficial to trees in good health and bearing freely. See chapter on the subject further on. Wall trees are also benefited by having their foliage syringed every evening with water in hot, dry weather.

Cordons and other trees grown on walls and fences and heavily laden with fruit should have the latter freely thinned out in an early stage of its development. Even half-standards, bushes, and pyramids often yield a large crop, and would be benefited by thinning. If trees are allowed to carry too heavy a crop the fruit cannot attain its normal size, nor will its flavour be properly developed. Besides, the strain on the resources of a heavily-cropped tree often cripples its future growth, and prevents it fruiting the next season. Thin out early, and be content with a moderate crop of well-developed fruit. (Figs. 67 and 68.)

Early Plums should be protected when in blossom in the manner advised for Apricots, which see.

Gathering and Storing the Fruit.—The exact time to gather each variety can only be determined by experience. To get the full and true flavour the fruit should be allowed to remain on the tree as long as possible. For dessert purposes use a pair of grape scissors to sever the stalk, or take hold of the stalk with the finger and thumb and pull the latter from the branch. Always gather the fruit when dry.

Such kinds as Coe's Golden Drop and Ickworth Imperatrice, if not gathered till quite ripe, then wrapped in

tissue paper and stored in a cool, airy place, will keep in good condition for a month or six weeks. Before wrapping in the paper it is advisable to expose the fruit to the sun for a day or so to get it thoroughly dry. (Figs. 67 and 68.)

Pests.—The following insects attack the foliage: The larvæ of the Winter, Umber, March, and Vapourer Moths; Clay-coloured, Green-leaf, and Oblong-leaf Weevils; Plum Sawfly, Slugworm, and Social Pear Sawfly; Leaf-curling, Mealy Plum, and Damson Aphis; Red Spider. The Goat and Leopard Moth larvæ and Shot Borer Beetle



Fig. 67. A LESSON IN THINNING FRUIT.

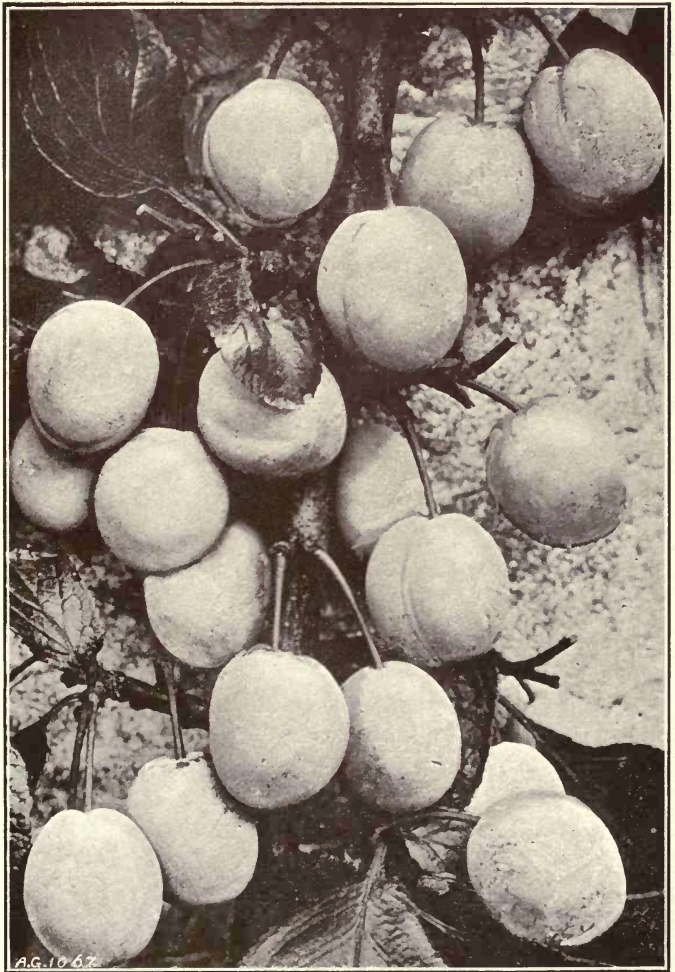
Owing to not thinning out the fruit in an early stage of growth, it is irregular in size.

attack the wood; Plum Fruit Sawfly larvæ the fruit; and various Scale insects the bark of the Plum tree.

Diseases.—The Bladder Disease attacks the fruit; Gummosis the branches, etc.; and the Silver-leaf Disease the foliage. See chapters on the subject, further on.

Best Dessert Plums.

Following is a list of what we consider to be the best dessert varieties:



DESSERT PLUM, OULLIN'S GOLDEN GAGE.
Season : Early August.



DESSERT PLUM, COES GOLDEN DROP
Season : September and October.

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Angelina Burdett.—A really good Plum, of exquisite flavour. Suitable for wall or bush culture. Free bearer. Fruit, medium-sized, round. Colour, dark purple, mottled brown. Flavour, rich, very juicy, sweet. Season, early September. Self-fertile.

Brahay's Green Gage.—A finely-flavoured Plum. Suitable for wall culture. Fruit, very large, roundish. Colour, greenish-yellow, with greyish bloom. Flavour, juicy, rich. Season, end of September. Self-sterile.

Bryanston Gage.—A hardy and prolific variety. May



Fig. 68. A LESSON IN THINNING PLUMS.

Owing to the fruit being cut freely in an early stage of development, it has grown to double the size of the unthinned specimens shown in Fig. 67.

be grown as a bush or on a wall. Fruit, large, round. Colour, golden. Flavour, very rich and juicy. Season, mid-September. Self-sterile.

Coe's Golden Drop.—A most delicious late Plum, but unfortunately a shy bearer. Does best on a south wall. Fruit, large, oval. Colour, greenish-yellow, freckled with red. Flavour, very rich, juicy, and sweet. Season, September and early October.

Denniston's Superb.—A first-rate Plum belonging to the Gage section. Bears freely as a bush or on a south wall.

Fruit, large, roundish. Colour, golden-yellow, blotched purple. Flavour, juicy and Gage-like. Season, mid-August. Self-fertile.

Early Transparent Gage.—A most delicious early Plum. A free bearer. Succeeds best on a south wall. Fruit, very large, round. Colour, yellow, mottled red. Flavour, very juicy and rich. Season, early August. Self-fertile.

Green Gage.—A splendid old Plum, useful for cooking as well as dessert. May be grown as a standard in the South; in other districts as a pyramid or bush, or on a south wall. Fruit, medium, round. Colour, yellowish-crimson, dotted with crimson. Flavour, delicious, melting, juicy. Season, mid-August. Self-sterile.

Ickworth Imperatrice.—A fine late Plum. Fruit can be stored for some weeks after it is ripe. May be grown as a pyramid or bush; also on a south wall. Fruit, medium, obovate. Colour, purple, streaked yellow. Flavour, juicy, rich. Season, October. Self-fertile.

Jefferson.—An American variety and a prolific bearer. Does well as a standard or pyramid. Should be grown on a south wall in cold districts. Fruit, large, oval. Colour, yellow, speckled with purple and red. Flavour, delicious. Season, early September. Self-sterile.

Kirke's.—A very fine Plum. Requires a south wall. Hardy and free-bearing. Fruit, very large, round. Colour, dark purple, golden specks. Flavour, juicy and very rich. Season, early September. Self-sterile.

Late Transparent Gage.—A first-rate late variety of the Gage section. May be grown as a standard or bush in the open, or against a south wall. Fruit, large, round. Colour, yellow, suffused red and purple. Flavour, juicy, sweet, rich. Season, end of September. Self-sterile.

Laxton's Utility.—A recently introduced variety, the result of a cross between Jefferson and the Peach Plum. Suitable for walls, or as a bush, pyramid, or cordon. Fruit,

large, oval. Colour, rich red. Flavour, firm, juicy, rich, and sugary. Season, mid-August. Self-fertile.

McLaughlin's Gage.—A Plum of American origin. Hardy and prolific. Suitable for bush or pyramid culture. Fruit, large, roundish. Colour, yellow, speckled red. Flavour, juicy, rich. Season, end of August. Self-sterile.

Oullin's Golden Gage.—A handsome Plum. Hardy and free-bearing. Suitable for bushes or pyramids in firm, not over rich soil. Fruit, large, roundish-oval. Colour, yellow, dotted with crimson. Flavour, rich and juicy. Season, early August. Self-fertile.

Purple Gage.—An excellent Plum. Hardy, free-bearing and doing well as a standard, pyramid, or on a south wall. Fruit, medium, round. Colour, violet-purple. Flavour, sugary, rich. Season, early September. Self-sterile.

Reine Claude de Bavay.—A delicious variety of first-rate quality. Requires a south wall. Fruit, medium, roundish. Colour, greenish-yellow. Flavour, very rich and sugary. Season, end of September. Self-fertile.

Select Culinary Plums.

The varieties described below represent the best of the cooking Plums. Some, indeed, are equally good for desert purposes.

Archduke.—An immense cropper. Hardy and suitable for bush or wall culture. Fruit, large, oval. Colour, purplish-black. Flavour, rich. Season, early October. Also suitable for dessert. Self-fertile.

Autumn Compôte.—Hardy and prolific Plum. Succeeds well as a pyramid. Fruit, very large, oval. Colour, red. Flavour, juicy, pleasing. Season, September. Self-fertile.

Belgian Purple.—A valuable early Plum. May be grown as a standard, pyramid, or cordon, or fan on a north wall. Fruit, large, roundish. Colour, violet-purple, with a blue bloom. Flavour, very juicy and rich. Season, August. Self-fertile.

Belle de Louvain.—A heavy cropping and free-bearing Plum. Suitable for a standard or bush, or for an east or west wall. Fruit, large, oval. Colour, rich purple. Flavour, juicy and rich. Season, end of August. Self-fertile.

Belle de Septembre.—A free bearer. Suitable for pyramids. Fruit, large, roundish to oval. Colour, reddish-purple, with a bluish bloom. Flavour, juicy, sweet. Season, early October. Self-fertile.

Blue Impératrice.—A good preserving Plum. Should be grown as a cordon or fan on an east wall. Fruit, medium, oval. Colour, yellow. Flavour, rich. Season, October. Self-sterile.

Czar.—A splendid Plum. Succeeds well as a standard or pyramid, or as a fan or cordon on an east or a north wall. Fruit, large, roundish-oval. Colour, blue-black, covered with a bluish bloom. Flavour, juicy, rich, and sweet. Season, early August. Self-fertile.

Diamond.—Another good preserving Plum. Succeeds as a standard or pyramid, or as a cordon or fan on an east or a north wall. Fruit, very large, oval. Colour, deep purple. Flavour, juicy, acid. Season, mid-September. Self-sterile.

Early Prolific.—An early preserving and cooking Plum. Useful also for dessert. May be grown as a standard or pyramid, or as a fan or cordon on a north wall. Fruit, medium, roundish. Colour, dark purple, with a bluish bloom. Flavour, juicy, sugary, sweet. Season, early August. Self-fertile.

Gisborne's.—A strong-growing and free-bearing Plum. Suitable for standards. Fruit, small, roundish. Colour, amber-yellow. Flavour, brisk, juicy. Season, mid-August. Self-fertile.

Grand Duke.—A very fine late Plum of excellent quality. Will succeed as a fan or cordon on an east or west wall; also as a pyramid in the open. A free bearer. Good also

for dessert. Fruit, very large, oval. Colour, purple, covered with a blue bloom. Flavour, sweet. Season, mid-October. Self-fertile.

Laxton's Prosperity.—A good, new, early culinary Plum. Suitable for standards, bushes, or walls. Fruit, roundish oval. Colour, black. Flavour, sweet and rich. Season, late August. Very heavy cropper. Self-fertile.

Mitchelson's.—An abundant cropper. Succeeds as a standard or pyramid, or as a fan or a cordon on a north wall. Fruit, medium, oval. Colour, black. Flavour, juicy and sweet. Season, early September. Self-fertile.

Monarch.—A very hardy and prolific Plum, succeeding as a standard or bush, or as a fan or a cordon on an east, west, or north wall. Fruit, very large, roundish-oval. Colour, dark purple. Flavour, juicy, good. Season, September. Self-fertile.

Orleans.—An old, but nevertheless very good, Plum. Prolific. Suitable for standards. Fruit, medium, round. Colour, red. Flavour, juicy, rich. Season, late August. Self-fertile.

Pond's Seedling.—A hardy and prolific variety. Suitable for standards. Fruit, very large, oval. Colour, red, with a bluish bloom. Flavour, juicy and brisk. Season, early September. Self-sterile.

Prince Englebert.—A very hardy and prolific Plum. Suitable to grow as a fan or cordon against an east, west, or north wall; also as a pyramid or standard. Fruit, very large, oval. Colour, purple, covered with a greyish bloom. Flavour, juicy, rich, brisk. Season, end of August. Self-fertile.

Sultan.—An excellent cooking Plum. A constant and good cropper. Suitable for a cordon or fan on a north wall, or a pyramid or standard. Fruit, large, roundish-oval. Colour, red, covered with a bluish bloom. Flavour, juicy, rich. Season, mid-August. Self-sterile.

Victoria.—The most popular cooking and preserving Plum in cultivation. Good also for dessert. Does well as a standard or pyramid, also as a cordon or fan against an east, west, or north wall. Fruit, large, oval. Colour, rich red. Flavour, juicy, pleasing. Season, early September. Self-fertile.

Wyedale.—A very hardy and prolific preserving Plum. Fruit small, oval. Colour, dark purple, covered with a blue bloom. Flavour, juicy, sweet. Season, October to November. Self-fertile.

Plums for the North.—Following are suitable for Northern counties, including Scotland: Cooking—Belle de Louvain, Czar, Early Prolific, Belgian Purple, Gisborne's, and Victoria. Dessert—Denniston's Superb, Early Transparent, Jefferson, Kirke's, Green Gage, and Reine Claude de Bavay. Above are suitable for bush culture.

Plums for Walls.—North aspect: Angelina Burdett, Early Transparent Gage, Jefferson, McLaughlin's Gage and Oullin's Golden Gage (dessert); Belgian Purple, Belle de Louvain, Early Prolific (cooking). East aspect: same as last. West aspect: Bryanston Gage, Kirke's, Purple Gage, and Laxton's Utility (dessert); Belle de Septembre, Victoria, Monarch, and Prince Englebert (cooking). South aspect: Coe's Golden Drop, Denniston's Superb, Green Gage, Late Transparent Gage, Ickworth Impératrice, and Reine Claude de Bavay (dessert); Archduke, Blue Impératrice, and Wyedale (cooking).

Plums for Cordons.—Angelina Burdett, Coe's Golden Drop, Denniston's Superb, Early Transparent Gage, Bryanston Gage, Early Green Gage, Jefferson, Kirke's, Oullin's Golden Gage, McLaughlin's Gage, Reine Claude de Bavay, and the Green Gage (dessert); Autumn Comôte, Belgian Purple, Early Prolific, Czar, Prince Englebert, and Victoria (cooking).

Plums for Standards.—Early Prolific, Victoria, Czar, Belgian Purple, Pond's Seedling, and Monarch (cooking); Green Gage, Denniston's Superb, Early Transparent, Jefferson, Late Transparent, and Bryanston Gage (dessert).

CHAPTER XXI.

The Quince.

THE QUINCE (*Pyrus vulgaris*) is related to the Pear, and belongs to the same genus. It was formerly placed in another genus, *Cydonia*, but modern botanists include it in the genus *Pyrus*. Its native country is not known, but some say it is a native of Europe. It appears that the ancients held the Quince in high esteem. Pliny tells us that many kinds of Quinces grew in Italy in his day, some of them wild; and that the fruit was used as a sovereign remedy for many complaints.

It is probable, therefore, that the Quince was introduced into this country during the Roman occupation. Anyway, the fact remains that Quince trees used to grow wild in the Wealds of Sussex, the fruit being gathered by the natives and converted into wine. Gerarde says this fruit was planted in his time in hedges and fences. Lord Bacon, too, seems to have been well acquainted with the fruit. Shakespeare also alludes to the fruit in "Romeo and Juliet"—

"They call for dates and quinces in the pastry."

In his time Quince marmalade was a favourite conserve. Tusser also makes reference to the Quince, so that there is little doubt its fruit was held in high esteem from the earliest times.

The Quince is supposed to be the "Golden Apple of the Hesperides." It is a low and slow-growing tree, bearing whitish or pinkish flowers in June, followed by Apple or Pear-shaped fruits, of a rich golden hue when

ripe, the flesh of which is highly perfumed. The ripe fruit, cut into slices, is often put into apple or pear tarts; made into a rich and refreshing wine; and converted into marmalade and jellies. The far-famed Cotignac preserve of the French and Italians is also made from this fruit. The Quince, of course, is the popular stock for Pears grown as cordons, bushes, etc.

Propagation.—The Quince is chiefly increased by layering the shoots in autumn—hillock layering. It can also be increased by cuttings, but the operation is a slow and uncertain one. Seeds rarely ripen in England, so that it is not possible to propagate Quinces by this method. See article on “Propagation” further on.

Soil and Situation.—The Quince succeeds best in a rich loamy soil. Heavy clays and sandy soils are not suitable. The position, too, should be a moist one, and, if possible, near a pond or stream. It is useless trying to grow the tree in a dry position. A sheltered, sunny position is also desirable.

Culture.—Plant in autumn. The trees may be grown as bushes or low standards. No pruning is required beyond thinning out weakly or other crowded branches, and this should be done in winter. Trees grown in soils that are not over moist should be given a thorough watering and an occasional application of liquid manure in summer.

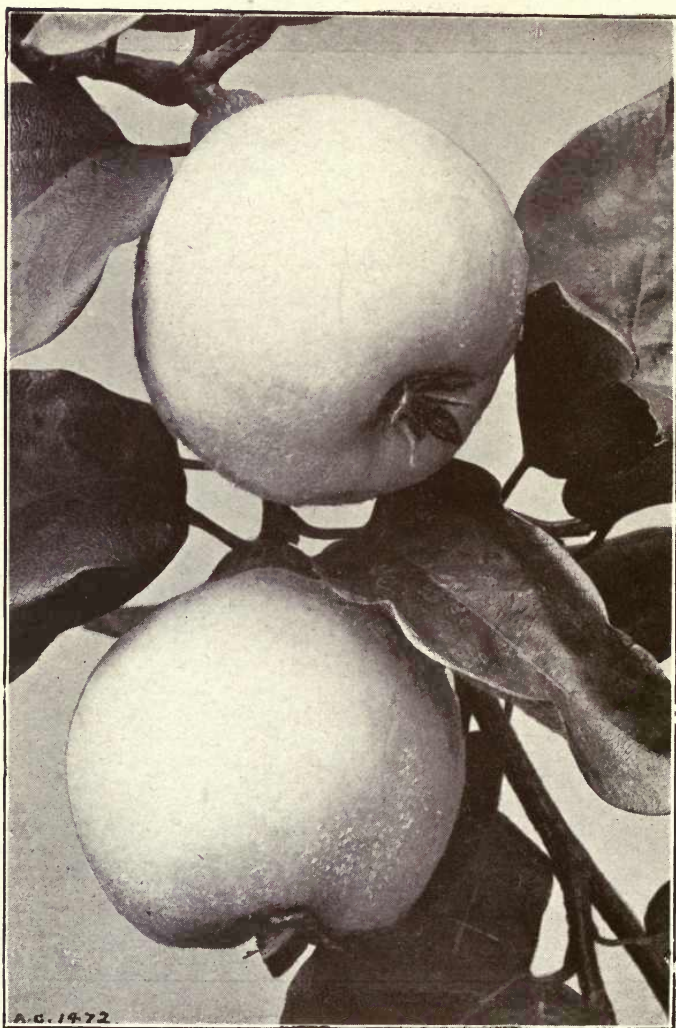
Gathering and Storing the Fruit.—The fruit is usually ready to gather early in October. Its ripened condition can usually be ascertained by its powerful aroma. As a rule, the flesh is hard when quite ripe. Store it on a layer of clean straw in any cool place away from Apples or Pears, otherwise the aroma from the Quince will be communicated to the latter. The fruit will, if not bruised in gathering, keep sound for six to eight weeks.



CULINARY PLUM, COX'S EMPEROR.

Season : September.

AG1049



A.C. 1472

FRUITS OF THE QUINCE.

Varieties.

The chief kinds grown are as follows:

Apple-shaped Quince.—Fruit, large, roundish. Skin, golden-yellow when ripe. Flavour, excellent. Very productive. Ripens early.

Pear-shaped Quince.—Fruit, large, pyriform. Skin, yellow and woolly. Flavour, moderate; flesh, dryish and woolly. Ripens late.

Portugal Quince.—Fruit, large, pyriform. Skin, golden-yellow and woolly. Flavour, delicate. Flesh turns crimson when cooked. Ripens late. Somewhat tender. This variety is much used as a stock for Pears.

CHAPTER XXII.

The Raspberry.

THE RASPBERRY (*Rubus Idæus*) is a native of this country, also of the temperate parts of Africa, Asia, Europe, and America. It grows wild in moist woods, etc., in various parts of the country. It does not appear to have been cultivated by the ancients. Gerarde, the sixteenth-century writer on gardening, says it was grown in gardens in his day, but its fruit was not held in such high esteem as that of the Bramble. This was the red Raspberry. The yellow and white varieties were introduced into this country from Antwerp.

Phillips, in his "History of Cultivated Fruits," informs us that, early in the last century, Raspberries were much cultivated in the neighbourhood of Isleworth and Brentford for supplying fruit to distillers for making Raspberry brandy and Raspberry vinegar. He also says: "Raspberries which are intended for the table are brought by women on their heads; their load consists of a round, or basket, containing twelve gallons, of three pints to a gallon; and, although the distance is ten miles from Isleworth to Covent Garden Market, they regularly perform the journey in two hours, for which they are paid three shillings and sixpence. These female fruit porters come to the vicinity of London for the season from Wiltshire, Shropshire, and Wales; in their long journeys they seldom walk at a less pace than five miles per hour."

The fruit of the Raspberry is highly esteemed for dessert; also for making jams and jellies, pies, etc., and likewise for flavouring purposes. Many housewives, too, make an excellent wine from the fruit, and Raspberry vinegar is also a refreshing beverage in summer.

Propagation.—The usual and best method is by means of suckers or offsets. These spring up freely at the base of the parent plants, and may be lifted and planted out in their permanent positions in autumn. Only the strongest suckers should be chosen for the purpose. Care should also be taken to see that they are well rooted. Raspberries may be readily increased from seed, but as

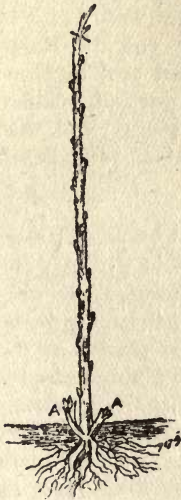


Fig. 69.
A "MAIDEN"
RASPBERRY PLANT

AA are growth buds at the base, not pruned back at time of planting; a mistake, see Fig. 70.

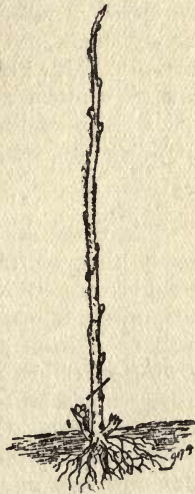


Fig. 70.
PRUNING A
"MAIDEN"
RASPBERRY PLANT.

The line indicates position to prune the cane when first planted.



Fig. 71.
A YEAR-OLD
RASPBERRY PLANT.

Showing growth made the first season as the result of cutting down.

seedlings rarely come true to type this method is seldom practised. They may likewise be propagated by cuttings of the points of well-ripened canes about 8in. long. Cut off the base close to a joint, and insert them 6in. deep in a moist, shady border in October. The cut-

tings will be rooted by the following autumn, when they should be planted out in their permanent quarters. For all ordinary purposes, however, suckers are better than cuttings.

Soil and Situation.—The Raspberry requires a deeply-tilled, rich soil, containing plenty of humus. Heavy soils dug deeply, and enriched with decayed vegetable matter and rotten manure, will grow Raspberries well. Light soils, or thin soils overlying chalk, do not suit the Raspberry unless liberally enriched with decayed cow manure. The situation, too, should be a moist and partially shaded one. The Raspberry is a deep-rooting plant, and also produces a mass of surface roots, so that a good depth of soil is indispensable.

Methods of Growing.—There are several ways of growing the Raspberry. One is to grow them in groups, the groups being 4ft. apart in rows 5ft. asunder. In this case three suckers are planted in each group, and the fruiting canes are trained to a stout stake placed in the centre. The strong-growing sorts are best planted singly, not in threes, and the rows should be 6ft. apart. Another method is to plant the canes singly 4ft. apart each way, place a stake midway between the plants, and to train half of the fruiting canes one way in an arching form to the stake, and the other half in the opposite direction. This plan allows the fruiting canes full exposure to the sun, while the young canes occupy the centre and do not shade the former. A third method is to train the canes to a wooden or a wire trellis. In this case the plants should be planted 2ft. apart; and, if more than one row is required, the rows should be 6ft. apart. The rows should run from north to south.

Planting.—This should be done in October or November; but, weather permitting, it may be accomplished any time in winter. Plant so that the crown of the root is

buried about 3in. Spread the roots out evenly, and use fine soil only for covering them. Tread the soil down firmly. After planting, mulch with rotten manure.

Subsequent Culture.—During the summer keep all weeds removed, and mulch the surface with long manure to keep the soil cool and moist. Copious waterings, too, should



Fig. 72. A BADLY GROWN RASPBERRY PLANT.

Result of failing to cut the cane back at planting time. No young shoots to bear fruit the following year.



Fig. 73. WRONG WAY OF PRUNING RASPBERRY CANES.

Pruned thus the fruit will be borne mainly at the top of the canes.



Fig. 74. RATIONAL METHOD OF PRUNING RASPBERRIES.

One-third of the canes are shortened two-thirds; another one-third, and the remainders have their tips only removed.

be given in dry weather. Liquid manure may also be given freely when the plants are in bearing. Suckers not required for forming new plantations should be pulled up when a few inches high. In winter, after the pruning is completed, top-dress with a couple of inches or so of rotten manure, and lightly fork this in. Except during the first

year it is not advisable to grow any crops between the rows, because the cultivation necessary would injure the roots. See also the chapter on "Manures" elsewhere.

Mode of Bearing.—The ordinary Raspberry bears its fruit on side branchlets formed on the canes of the preceding year's growth. The fruiting canes are, therefore, of biennial duration—that is, they grow one year and bear fruit the next, after which they die. Autumn-bearing Raspberries, however, bear their fruit on the current year's wood.

Pruning.—Canes planted in autumn will require to be cut back in the following March, the weakest close to the ground and the strongest to 1ft., in order to encourage new canes to develop for bearing the next season. If not pruned thus, the stool, or root, will only produce short, weak canes, incapable of bearing fruit. It is better, therefore, to sacrifice fruit the first season, and instead get good young canes to bear the second season. The second and subsequent seasons all canes of the preceding year's growth, which have borne fruit, should be cut clean away as soon as the crop is gathered. This means that only canes of the current year will be left. In the case of two or three-year-old plants select about three or four of the strongest of the young growths for future bearing, and remove all others. (Figs. 69 to 72.)

In later years four to six young canes should be retained on each plant. In autumn, when the leaves are off, the soft unripened tip of each cane should be cut off close to firm wood. When grown in groups, each group should be provided with a stout stake 4ft. high, and the canes be neatly tied to this with tar twine. Those that are to be trained on the arching system should be similarly pruned, and the canes bent over and tied to the stake. Those, again, to be trained to a trellis should be spread out evenly, and tied in position.

When Raspberries are grown in groups it is the practice of some growers, in the case of canes of varying

growth, to shorten the outer or weaker canes half-way, those a trifle stronger one-third, and from the strongest only remove the soft tips. The advantage of this plan is

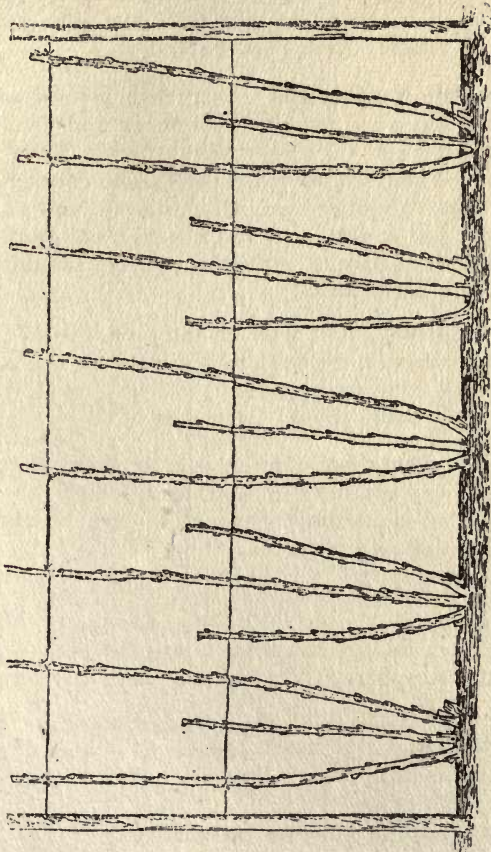


Fig. 75. METHOD OF PRUNING RASPBERRIES GROWN IN ROWS. The pruning, as will be seen, is carried out on the same principle as illustrated in Fig. 74.

the group of canes bears fruit freely from base to apex. It is the natural tendency of canes that are left practically their full length to bear fruit only on the upper

half, and hence the system just explained ensures fruit forming freely at the base of the short ones. One market grower of our acquaintance always prunes his vigorous canes back half-way, and he, in consequence, not only ensures a heavier but also a finer crop from the well-ripened lower half of his canes. (See Figs. 74 and 75.)

Autumn-bearing Raspberries.—There are several sorts of Raspberries that yield fruit in September and October only, but they are not very generally grown. They are of bushy growth, and require no stakes. The canes have to be cut off close to the ground in February. New canes form in due course, and it is on the tips of these that the fruit is borne the following autumn. They should be grown 4ft. apart each way.

Gathering the Fruit.—The fruit should be gathered only when dry. For dessert, gather the berries with the stalk attached; but for cooking purposes the berry only, without the core and stalk, should be picked.

Duration of a Plantation.—As a rule a plantation, if well managed, will continue in bearing for eight to ten years. When the canes show signs of waning in vigour a new plantation should be made.

Pests.—The Raspberry Aphis infests the leaves; the Raspberry Beetle the flower buds; the Raspberry Moth and the Raspberry Sawfly larvæ bore into the pith of the shoots; and the Raspberry Weevil feeds on the leaves.

Diseases.—The Raspberry Spot Fungus attacks the young canes and leaves. See chapter on "Pests and Diseases."

Varieties of Summer Raspberries.

Baumforth's Seedling.—An old and good variety. An abundant cropper. Fruit, large, roundish. Colour, crimson. Flavour, very rich. Vigorous grower.



RASPBERRY, CARTER'S PROLIFIC.



A. G. 252.

AN EARLY STRAWBERRY, ROYAL SOVEREIGN.
Season : June.

Carter's Prolific.—A very hardy and sturdy-growing variety. May be grown without stakes. Fruit, large, round. Colour, red. Flavour, excellent.

Golden Drop.—A strong grower and free bearer. Fruit, large and round. Colour, golden-yellow. Flavour, rich and pleasant. Ripens in July. An attractive variety.

Hornet.—A vigorous grower. Free bearer. Fruit, very large, ovate. Colour, dark red. Flavour, rich.

Laxton's Bountiful.—A new variety of first-rate merit. Fruit, very large, conical, ovate. Colour, bright crimson. Flavour, sweet and juicy. Growth, robust.

Marlboro' (syn. Bath's Perfection).—A variety of vigorous growth with crimson stems. Fruit, medium-sized, round. Colour, a brilliant scarlet. Flavour, rich. A free cropper of American origin.

Red Antwerp.—An old and very productive variety. Fruit, large, conical. Colour, crimson. Flavour, brisk, rich. Growth vigorous.

Semper Fidelis.—A strong grower and free cropper. Good for preserving. Fruit, large, conical. Colour, rich red. Flavour, good. A continuous bearer.

Superlative.—The best of the summer Raspberries. Continues to bear for some time. Fruit, very large, conical. Colour, deep red. Flavour, brisk and rich. Vigorous grower.

The Guinea.—Vigorous grower, resembling Superlative. Fruit, very large, conical. Colour, yellow. Flavour, brisk and pleasant. The best of the yellow varieties. A yellow form of the last-named.

White Magnum Bonum.—A very free bearer. Fruit, large, conical. Colour, white. Flavour, juicy, sweet.

Yellow Antwerp.—An old variety. Fruit, large, conical. Colour, yellow. Flavour, sweet and rich. Suitable for dessert or preserving.

Autumn-bearing Raspberries.

Alexandra.—A very vigorous and fruitful variety, ripening in October. Fruit, large and conical in shape. Colour, deep red. Flavour, rich. Of excellent merit.

Belle de Fontenoy.—Fruit, large, round. Colour, purplish-red. Flavour, good. A sturdy grower. Ripe in October.

Everbearing Feldbrunnen.—A new variety, certificated by the R.H.S. in 1912. Grows vigorously, and bears heavy crops of fine flavoured fruit from August to November.

Hailsham.—Also known as the Hailsham-berry. A vigorous-growing and free-fruited variety, ripening in October and November. Fruit, very large and round. Colour, dark red. Flavour, rich and juicy. The best of the autumn-bearing Raspberries.

November Abundance.—A vigorous grower, bearing freely until November. Fruit, very large. Colour, deep red. Flavour, excellent. One of the best.

October Red.—An old sort, which bears fruit from July to October. Fruit, medium. Colour, red. Flavour, brisk. Free bearer.

October Yellow.—An old sort. Free bearer. Fruit, medium. Colour, yellow. Flavour, juicy and sweet. Ripe in October.

Orange d'Automne.—A sturdy prolific variety. Ripens in October and early November. Fruit, large to very large. Colour, clear bright orange. Flesh, firm, juicy, and of rich flavour. A good variety.

Surprise d'Automne.—A Continental variety ripening in November. Free-bearing. Fruit, large, round. Colour, yellow. Flavour, rich, juicy, and sweet. The latest of autumn Raspberries.

CHAPTER XXIII

The Strawberry.

THE STRAWBERRY is unquestionably one of the most delicious of our hardy fruits. It exists in a wild state on hedge banks, in woods, and on waste spots in this country, and is still more abundant in the North of Europe, Sweden especially. On the Continent, indeed, the fruits of the Wild Strawberry are appreciated more than those of the cultivated kinds.

In the thirteenth century mention was made in the Household Roll of the Countess of Leicester of Strawberries; and in the time of King Henry VIII. the fruit was valued at fourpence per bushel. Strawberries appear to have been grown in gardens at that period, but they were evidently the ordinary Wild or Wood Strawberry (*Fragaria vesca*). Tusser, the farmer poet, alludes to them in his quaint verse:

“ Wife, into the garden, and set me a plot
With Strawberry roots of the best to be got ;
Such growing abroad among thorns in the wood,
Well chosen and picked, grow excellent good.”

This reference appeared in the sixteenth century. Gerarde, later in the same century, mentions the Hautbois Strawberry (*Fragaria elatior*) as being grown in gardens. Parkinson also describes the Wood and the Hautbois, also the Virginian Strawberry, in his writings early in the next century. In the eighteenth century the Alpine Strawberry (*Fragaria alpina*) was introduced into this country from the Continent, and apparently grown largely in gardens.

Other kinds grown in gardens were the Scarlet or Virginian Strawberry (*Fragaria virginiana*), from North America; and the Chili Strawberry (*Fragaria chiloensis*),

from Chili. These, however, according to Philip Miller (early in the eighteenth century), were not considered to be so valuable for cultivation as the Wood Strawberry.

It was not until the beginning of the last century that the present race of cultivated Strawberries was introduced, the earlier types being the result of a cross between *Fragaria virginiana* (Virginian or Scarlet Strawberry) and *Fragaria chiloensis* (Chili Strawberry). From these have originated all the large-fruited kinds now in cultivation. To-day, therefore, we have three types of Strawberries in our gardens—the Alpine, or Small-fruited; the Large-fruited; and the Perpetual. The first are esteemed for their free and continuous-bearing qualities, also easiness of cultivation; the Large-fruited for size and flavour; and the Perpetuals for yielding a supply of berries throughout summer and autumn. The Perpetuals are the result of a cross between the Alpine and the Large-fruited kinds, and they promise to become a popular type of Strawberry.

Propagation.—The Strawberry may be increased by seeds and by runners. The former method is adopted in the case of the Alpine varieties only, as experience has proved that the Large-fruited kinds do not, as a rule, come true from seeds.

To rear Alpine Strawberries from seed, the seed should be obtained from ripe fruit by squeezing it out of the flesh of the berry, and rubbing it in sand to cleanse it, or by purchasing it from seedsmen. In both cases sow it in shallow boxes of light soil in gentle heat in summer or spring. Cover slightly with fine soil. As soon as the seedlings can be handled, transplant them 2in. apart in boxes, keep in a cold frame for a few weeks, then plant out in their permanent positions. Or the seed may be sown outdoors in March. The seedlings can either remain where they are or be transplanted. In both cases the plants will yield fruit the following year.

Propagation by runners is effected by severing the strongest plantlet as soon as rooted sufficiently in the soil,

lifting it carefully, and then replanting in the permanent bed. The better way, however, is to fill some 3in. pots with good turfy soil, plunge these half their depth in the soil near the plants, place the plantlet nearest the parent plant on the soil, and fix it firmly thereon by means of a peg or a stone. In this case pinch off the point of the runner close to the plantlet. The soil in the pots must be regularly watered in dry weather. This layering process should be done in June or early July; then the plantlets will be sufficiently rooted to sever from the parent

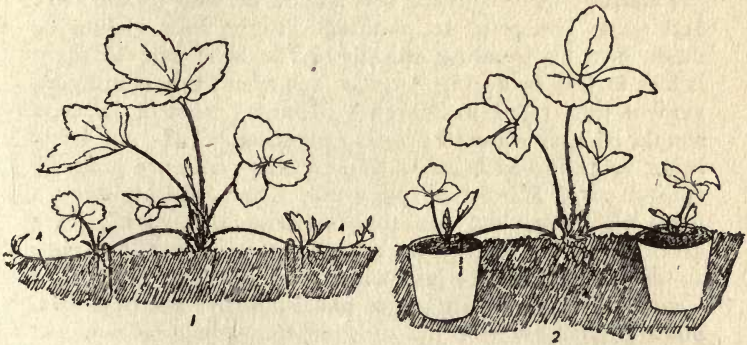


Fig. 76. MODE OF LAYERING STRAWBERRIES.

1—Layering runners on the soil. 2—Layering runners in pots.

plant early in August. Care should be taken to select runners only from plants that are fruiting freely, otherwise the rooted runners may prove infertile next season. (Fig. 76.)

Soil and Position.—The Strawberry will succeed on most soils that are rich in humus, deeply dug, and not too heavy or damp. Clay soils should be deeply dug, liberally manured and limed, and have also plenty of decayed refuse or grit added to them to render them porous. Light soils require a dressing of clay or loam, and plenty

of cow or pig manure added to them to render them compact and moisture-retaining. Strawberries usually do well on land just cleared of early potatoes. The Strawberry is a deep and free-rooting plant; hence deep digging of the soil prior to planting is most essential.

As to situation, a sunny one is indispensable. Wherever possible the site for the beds should be one sloping to the south, south-east, or south-west. The Alpine Strawberry will do well on sloping banks or around the base of dwarf fruit trees, or in borders by the side of paths.

Planting.—The surface soil should be well forked over and made fine prior to planting. Light soils should be made firm by treading slightly. The best time to plant is late in July or during August, but where this is not convenient then plant in March. Runners rooted in pots should be well watered prior to planting. Take out fairly large holes for each plant, and see the roots are properly spread out. Make the soil firm. After planting give a good watering, and see that subsequent waterings are given in dry weather. Do not plant too deeply, but only so that the crown is just above the soil. In very hot weather it is an advantage to place a flower pot over each plant to shield it from the sun, but this should be removed at night. (Fig. 77.)

Distances for Planting.—The usual distances are 15in. apart in the rows, and 30in. between the rows. On very rich soils it is, however, advisable to plant 18in. apart in rows 3ft. asunder. When grown as edgings to garden paths, plant 18in. apart, the row being a similar distance from the path. Alpines are usually grown in beds 4ft. wide, with 1ft. alleys between. The distance between the plants should be 1ft.

General Cultural Details.—After planting, subsequent cultural details consist of keeping all runners removed and the soil free from weeds by frequent hoeing. In autumn top-dress the bed with a layer of littery manure. The fol-

lowing season, as soon as the flowers appear, place a layer of clean straw between the plants to prevent the fruit being splashed by soil in wet weather. Should the weather be dry, give copious supplies of water, with an occasional application of liquid manure during the fruiting period. Unless runners are required for planting new beds, these should be removed as soon as they have formed. After the crop is gathered, clear off the straw litter, also all weeds, and likewise trim off the larger outer leaves. In

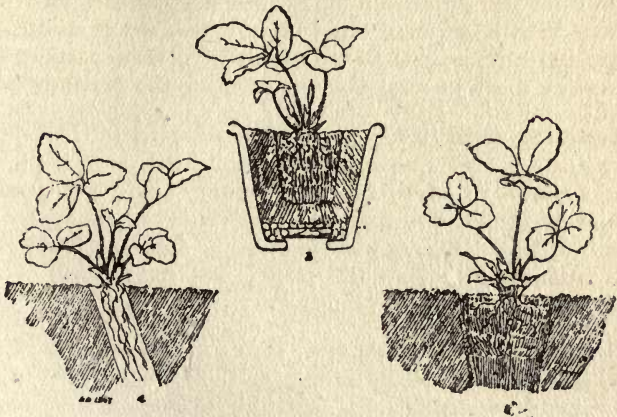


Fig. 77. PLANTING STRAWBERRIES.

3—Correct way to plant layers in pots. 4—Wrong way to plant a rooted layer. 5—Planting pot-layered runners in ground.

autumn very lightly fork over the surface soil, and again top-dress with manure, adding also the fertilisers recommended further on in this book. On no account dig between the plants with a spade.

Duration of Plantations.—Experience has shown that it is advisable not to retain plants after the third season of fruiting. After that period the fruit usually diminishes in size, quantity, and quality. It is a good plan to make a

plantation yearly, so as to keep up a succession of fruiting plants. The finest fruits are borne on two-year-old plants, and the heaviest crop on those three years old.

Thinning and Protecting the Fruit.—If exceptionally fine berries are needed for exhibition, the flower trusses must be thinned out early, retaining the strongest only. Allow about a dozen fruits to form on each plant, and one fruit only—the biggest—to develop on each peduncle. As soon as the berries begin to colour, protect the plants with fish-netting, or the birds will play havoc with the fruit. Trusses bearing big fruits for exhibition should be supported off the ground by means of a forked stick, or by one of the wire contrivances sold for the purpose.

Alpine Strawberries.—Hints on rearing these from seed have already been given. They may, however, be reared from runners, as advised for the ordinary kind. The plants should be grown 1ft. apart, and no runners be allowed to form on them. Mulch with manure in autumn, and keep free from weeds; then the plants will fruit freely from June to November.

Hautbois Strawberries.—A race of Strawberries remarkable for the musky aroma of their flesh. They are, however, very shy bearers, and few people care to grow them in consequence. Unless great care is exercised in securing runners from free-fruited plants, they may prove sterile. They should be planted 15in. apart each way.

Perpetual-fruited Strawberries.—As previously mentioned, this race of Strawberries is the result of a cross between the Alpine and the ordinary Large-fruited Strawberries. They are of sturdy growth, and flower and fruit continuously from May to December. The fruits are of medium size, and borne very freely. They are suitable for small gardens, and should be planted 15in. apart in rows 2ft. asunder. In all other respects treat them as advised for the ordinary kind.



A.G. 250

EARLY STRAWBERRY, AUGUSTE NICAISE.

Season: June



A.G.981.

LATE STRAWBERRY, ELEANOR.

Season : July.

Pests.—The leaves are liable to be infested with the Strawberry Aphis and the caterpillars of various moths. Eelworms also attack the roots and foliage. Snails and slugs attack both leaves and fruit. Birds and millepedes also attack the fruit.

Diseases.—The Strawberry-leaf Spot and the Strawberry Mildew do injury to the foliage. See chapter on "Pests."

Six Early Strawberries.

Black Prince.—A very early variety. Free bearer. Fruit, medium-sized. Colour, dark, almost black. Flavour, rich. Good for dessert or preserving.

King George V.—A grand, new, early variety, the result of a cross between Royal Sovereign and Louis Gauthier. Fruit, very large, conical. Colour, bright scarlet. Flavour, delicious; flesh, orange-red. A very heavy cropper.

King of the Earlies.—A prolific variety. Fruit, small to medium. Colour, crimson. Flavour, rich, juicy, with a pine aroma. Excellent.

Noble (Laxton's).—A large-fruited variety. Fruit, very large, broadly conical. Colour, bright crimson. Flavour, moderate. Very heavy cropper.

Royal Sovereign.—A popular variety. Fruit, very large, conical, or flattened. Colour, glossy scarlet. Flavour, rich. Free cropper.

Scarlet Queen.—A handsome variety. Fruit, large and conical. Colour, vermilion-scarlet. Flavour, very rich. Free cropper.

Six Mid-season Strawberries.

Gunton Park.—A good bearer. Fruit, extra large, wedge-shaped. Colour, dark crimson-scarlet. Flavour, pleasant and brisk.

James Veitch.—A hardy and prolific variety. Fruit, very large, conical, wedge-shaped. Colour, scarlet. Flavour, sweet.

Maincrop (Laxton's).—An exceptionally good main crop variety. Fruit, very large, broadly conical. Colour, rich scarlet. Flavour, first-rate. Good firm flesh. Crops heavily.

Monarch (Laxton's).—A prolific variety. Fruit, very large, wedge-shaped. Colour, brilliant scarlet. Flavour, rich.

President.—An old but good variety. Fruit, large, conical. Colour, crimson-scarlet. Flavour, good. Prolific.

Sir Joseph Paxton.—A very hardy and free-cropping variety. Fruit, large, conical. Colour, bright scarlet. Flavour, good. The best mid-season Strawberry.

Six Late Strawberries.

British Queen.—The best-flavoured Strawberry. Fruit, large, conical or wedge-shaped. Colour, pale red. Flavour, delicious. Requires a well-drained soil and a warm position.

Dr. Hogg.—A hardy, free-bearing, and good-flavoured variety. Fruit, large, wedge-shaped. Colour, bright scarlet. Flavour, rich, aromatic. Requires a rich soil.

Elton.—One of the oldest varieties. Good sort for preserving purposes. Fruit, medium-sized, conical. Colour, glossy scarlet. Flavour, brisk, sub-acid. Prolific.

Frogmore Late Pine.—Fruit, large, conical. Colour, scarlet. Flavour, rich, aromatic.

Latest of All.—A prolific and good variety. Fruit, very large, oblong. Colour, crimson. Flavour, juicy, rich.

Waterloo.—A popular late variety. Fruit, very large, globular. Colour, dark crimson. Flavour, juicy, very rich.

Alpine Strawberries.—The following varieties are worthy of cultivation: Alpine White, white berries; Belle de Meaux, crimson berries; Pink Pearl, pink berries; and Sutton's Large Red Alpine, one of the best and most prolific varieties, easily reared from seed.

Perpetual Strawberries.—The best sorts are Laxton's Perpetual, Atkin's Continuity, St. Antoine de Padoue, and St. Joseph.

ADDITIONAL VARIETIES.

Early.

Vicomtesse Hericart de Thury.—An old free-fruited variety; good for preserving. Fruit, medium-sized, conical. Colour, bright red. Flesh, pale red, firm, and solid.

Mid-season.

Louis Gauthier.—An enormous cropper. Fruit, very large, roundish. Colour, peach-pink. Flesh, lemon-white, soft. Flavour, juicy and melting. Very hardy; good for town gardens.

Fillbasket.—An old but very prolific variety. Fruit, large, long and conical. Colour, glossy scarlet. Flesh, pale, firm, and juicy. Flavour, sweet and aromatic. Very hardy.

The Earl.—A vigorous and free bearer. Fruit, large, conical. Colour, bright red. Flesh, pale, firm, and very solid. Flavour, rich and juicy. A fine variety for preserving.

Late.

Givon's Late Prolific.—Free grower and heavy cropper. Fruit, very large, roundish-oval. Colour, dull crimson. Flesh, firm. Flavour, rich and brisk. A good very late sort.

Eleanor.—A good old compact-growing variety. Fruit, large, conical, or wedge-shaped. Colour, carmine-red. Flesh, red and firm. Flavour, sub-acid and brisk. Does well in dry seasons.

CHAPTER XXIV.

The Strawberry-Raspberry.

SOME years ago a fruiting plant was introduced into this country under the above name, and we believe several specimens were planted, but, so far as we know, they have never yielded very remarkable results. According to Mr. F. W. Card, in an American book on "Bush Fruits" (Macmillan and Co.), the above plant belongs to a species found wild in Japan, China, and the East Indies, and is botanically known as *Rubus rosæfolius*. When first introduced it was reputed to be a hybrid between the Strawberry and the Raspberry, but according to the foregoing facts this is a pure myth.

The plant is herbaceous in habit, that is, like the autumn-bearing Raspberries, its shoots die down to the ground in winter, new growths appearing in spring. The foliage is of a pleasing light green tint, the leaflets narrow and borne five to seven on a stalk, and elegantly serrated on the margins. The blossoms are pure white, very attractive and fragrant. The berries are more or less globular, bright red in colour, but somewhat insipid and sour in a fresh state, but when cooked are said to make a palatable syrup.

Mr. Card says the plant is unproductive in America, but he notes that Messrs. Laxton Bros. describe it in their list as being both hardy and prolific. One good trait in its character is it is immune from insect attacks. In any case we have had no experience in its culture, and, considering that the flavour is admitted to be poor, we do not think the Strawberry-Raspberry is a fruit that is worth cultivation except as a curiosity. If grown at all, it should be accorded similar treatment to the autumn-fruiting Raspberries.

CHAPTER XXV.

The Walnut.

THE WALNUT (*Juglans regia*) is a native of Persia and Asia Minor, and a deciduous tree of noble habit when full grown. The Grecians apparently introduced it from its native habitat, and cultivated it extensively under the name of the "Royal Nut." From thence it was introduced to Italy in the reign of the Emperor Tiberius; and the nuts were, says Pliny, honoured with the name of "Jupiter's Nuts." They were evidently highly esteemed by the Romans, for, says Pliny, "The more walnuts one eats with more ease will he drive worms out of his stomach, and that, eaten before meals, they lessen the effects of any poisonous food; eaten after onions, they keep them from rising, and prevent the disagreeable smell." The exact date of the introduction into England is not known, but a writer named Turner remarks in 1551: "It is so well known in all countries that I need not to describe." Gerarde, at the close of the same century, wrote: "The Walnut tree groweth in fields neere common highwaies, in a fat and fruitful ground, and in orchards." It is said that in excavating the soil for the foundations of the Royal Exchange, the shell of a walnut was unearthed 35ft. below the surface, so that the Romans may have first introduced the tree here.

At the present day one or more fine old trees are grown in most old gardens or orchards, and the nuts are held in high esteem in a ripe state for dessert, also in a green state for pickling. In fact, a large and fruitful tree is a source of considerable revenue to many a cottager and farmer. The Walnut would doubtless be grown more extensively than it is if it were not for the fact that it is so liable to injury by spring frosts and severe winters, and cannot

therefore be relied upon to yield crops, as in the warmer climate of France, Italy, etc.

Propagation.—Although readily reared from seed, trees thus obtained rarely fruit satisfactorily. Seedlings make good ornamental trees for yielding timber, and that is all that can be said in their favour. An exception must, however, be made of one variety, known as *Juglans fertilis*, this coming true from nuts. Other methods are flute-budding in September and saddle-grafting in late April or May. Considerable skill is required to carry each method out successfully, and therefore it is better to purchase trees from a nursery.

Soil and Situation.—It may truly be said that, where apples will thrive, so will walnuts. The ideal soil would be a calcareous loam resting on a gravelly subsoil. Exposed or low-lying, damp positions, are quite unsuitable. A position, too, sheltered from north or east winds is very desirable.

Planting.—The best time to plant is in October; or, failing then, in March. Take care to purchase trees that have been frequently transplanted, and have a fair amount of fibrous roots. Trees that are over large, more than four or five years' old, and have few fibrous roots, should be avoided. Make fairly large holes, so that the roots can be spread out fully, and see the soil is made firm. Do not plant less than 5ft. apart. See they are securely staked, and during the first season have their roots kept moist. Before planting it is well to trench each site 2ft. to 3ft. deep, and 8ft. wide, so as to give the trees a good start.

Mode of Bearing.—The flowers are uni-sexual—i.e., male and female, borne separately on the same trees. The males are borne in drooping catkins, and the females either singly or in clusters of three, and cup-shaped, at the terminals of the shoots. The males generally appear first,

and if these should be injured by frost no nuts can form. Some trees, moreover, are shy in producing male flowers, in which case they do not bear freely.

Pruning.—The Walnut requires no pruning beyond removing dead or sickly wood. There is a common belief that Walnut trees bear more freely if their branches are well beaten, hence the old doggerel:

“A woman, a dog, and a walnut tree,
The more you beat them, the better they be.”

This is a great mistake; it is liable to bruise the branches, and set up decay. Leave the trees to nature, and they will take care of themselves.

Gathering and Storing the Nuts.—For pickling purposes they should be gathered by hand in June. For storing in a ripe state the nuts are usually ripe in October. The best way is to allow the nuts to fall off as they ripen, then pick them up. But where there is any risk in leaving the nuts to fall naturally, the branches should be lightly beaten with a long pole to cause the nuts to fall off. After gathering store them in a thin layer in any cool, airy place until the husks naturally split; then remove the nuts and again spread them out to dry, after which place them in a sack and shake them backwards and forwards to get them clean ready for storing. The best method of storing is in shallow alternate layers of sand, a little salt being sprinkled over the nuts before adding the sand. Store thus in casks or jars. Should the kernels get shrivelled remove them from the shells, and soak them for a few hours in milk and water, when they will regain their normal plumpness.

Pests.—Lice attack the under and upper sides of the leaves, and Leaf-gall Mite causes bladder-like swellings on the leaves. Rooks, squirrels, and rats also eat the nuts.

Varieties.

Following are the varieties in cultivation :

Common.—Fruit, oval, medium-sized. Kernel, sweet and full. A good bearer, and hardy.

Dwarf Prolific.—Fruit, oval and large. Kernel, full and of good flavour. Of moderate growth. Comes into bearing when three years old, and does well grown as a pyramid. Often does not produce male blossoms till several years old; hence, unless other and older trees bearing male flowers are near at hand, the trees do not always bear freely.

Thin-shelled.—Fruit, oblong and double. Shell, very thin. Kernels, large, plump, full, and tender. Flavour, excellent. Early and free bearer. The best variety.

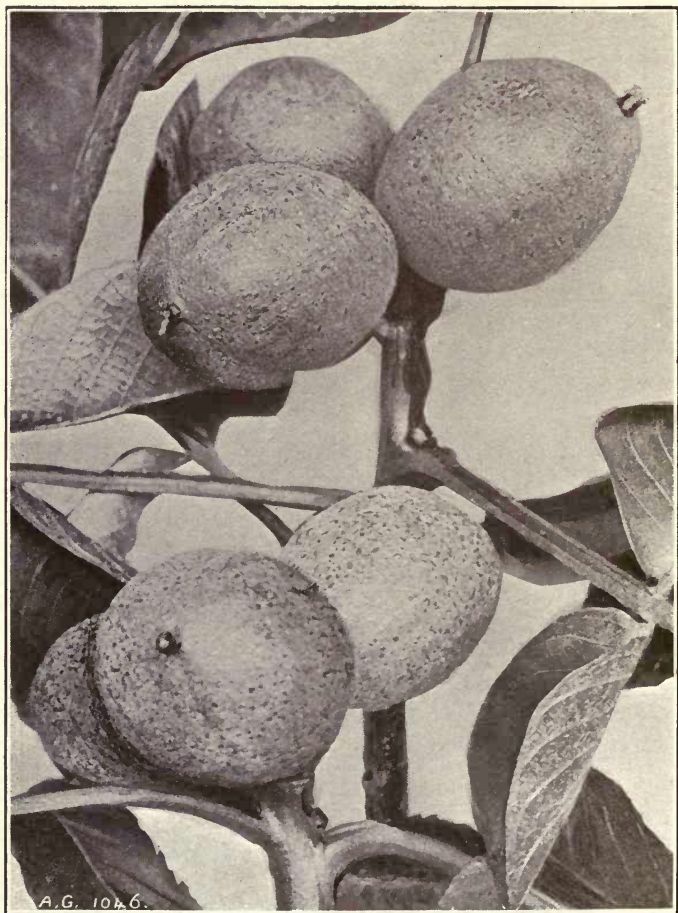
Yorkshire.—Fruit, medium-sized. Shell, thin. Kernel, plump. Flavour, very good. A hardy and free bearer.



A.C.251.

A POPULAR LATE STRAWBERRY, WATERLOO.

Season: July.



THE WALNUT,

CHAPTER XXVI.

The Wineberry.

THIS is a species of Raspberry, botanically known as *Rubus phænicolasius*, which was originally discovered growing wild in the mountains of Central and Northern Japan. It appears that seeds of it were sent by a Mr. J. T. Lovett in 1887 to Professor C. Georgeson, of Kansas, U.S.A. In 1889 he sold his stock of plants to Mr. John Lewis Child, the well-known American florist and seedsman, who placed it in commerce.

The plant grows 3ft. to 6ft. high, has rambling canes thickly covered with red hairs and weak prickles, light green leaves having a whitish under-surface, and fair-sized berries, which are white at first and red when ripe. Until the berries are ripe they are enclosed within large, hairy, viscous sepals. They are sweet and agreeable in flavour, and, as they all ripen at the same time on each spray, the sprays can be cut off and dished up thus for dessert. The berries are also good for making jams or jellies. It appears that the Wineberry does not succeed well in America, but in many districts in this country it has done fairly well.

Culture.—The plant is propagated by layering the tips of the shoots, as advised for the Loganberry, which see. Any good ordinary soil will suit the Wineberry, if it is deeply dug and well manured prior to planting. Plant in autumn or March, 4ft. apart each way, and treat it as advised for the Loganberry and Blackberry in the matter of pruning, training, feeding, etc.



Part II.—PRACTICAL WORK.

CHAPTER I.

Propagation of Fruit Trees.

FRUIT trees are propagated by means of seeds, budding, cuttings, grafting, and layering.

By Seeds.—This method is only practised for rearing new sorts of fruits after careful cross-fertilisation, with the specific view of obtaining an improved variety or varieties, or for the purpose of obtaining trees intended to serve as stocks for budding or grafting thereon existing varieties of fruits. No useful purpose is served by rearing fruit trees from seeds in an ordinary haphazard way, as, unless the flowers were carefully fertilised beforehand with a definite object in view, the resultant seedlings, after years of cultivation, would, in all probability, turn out worthless. In a general way, therefore, rearing fruit trees from seed is not to be recommended.

Assuming, however, seeds of Apples and Pears have been obtained as a result of definite cross-fertilisation, with a view to obtaining a new variety, sow them as soon as ripe, in pots of light, sandy soil, in a cold frame. Do not give much water till spring. When the seedlings are 3in. high, plant them out 18in. apart in rows 3ft. asunder. Let them

remain there for one year; then transplant them 3ft. apart in rows 6ft. asunder. As soon as the branches meet, again lift and replant 10ft. apart each way. The seedlings of Apples usually commence to bear fruit when seven to ten years old, and those of Pears when twelve to fifteen years old. If the fruit produced promises to be a distinct novelty, then take scions from the tree, and graft them on the Crab or the Paradise stock in the case of Apples, and the Quince for Pears.

Crabs for forming stocks for grafting Apples on should be reared as follows. Extract the pips from ripe Crabs in the autumn, and store them in sand till spring; then sow them in drills 1in. deep and 6in. apart. The seeds should be placed 3in. apart in the drills. The following autumn transplant the seedlings 1ft. apart in rows 3ft. asunder. Shorten the tap roots about half-way. The next autumn again transplant 3ft. apart, and the third year transplant 6ft. apart. When the stems are $\frac{3}{4}$ in. in diameter they are ready for grafting.

Apricot seeds (stones) should be sown as soon as ripe (August or September) 6in. apart in drills 2in. deep and 6in. asunder, in a warm, sheltered border. The following autumn lift the seedlings, shorten the tap-roots, and replant 2ft. apart in rows 3ft. asunder. The trees begin to yield fruit when five to seven years old.

Plums, Bullaces, and Damsons are reared in the same way. If to be used as stocks for budding, the seedlings should be cut back close to the soil in February after the first transplanting.

Cherry stones sow in the same manner as soon as ripe. Transplant the seedlings the second year 1ft. apart in rows 3ft. asunder. If required as stocks for budding, bud them the following summer; but if to be fruited, transplant the next autumn 2ft. apart in rows 4ft. asunder.

Peaches, Almonds, and Nectarines, sow as advised for Apricots. If to be used as stocks, bud the seedlings when two years old. Plums, Peaches, Cherries, and Nectarines begin to bear fruit when five to seven years old.

Medlars are reared from seed for yielding stocks for grafting superior varieties on. Sow the seeds when ripe in pots of sandy soil in a cold frame. The seeds take two years to vegetate. Grow in the pots till autumn, then plant 2ft. apart, and graft the following year.

Figs rarely do well reared from seeds. Procure seeds from the finest ripe fruits, wash them free from pulp, store till January, then sow in light soil in heat. When the seedlings are a couple of inches high plant them singly in small pots, and grow on under glass. Seedlings fruit when five to six years old.

Mulberry seeds should be collected from large ripe fruits, washing them in water to get rid of the pulp. Sow them at once in light soil in pots under glass, keep them there till May, then plant outdoors 1ft. apart in rows 2ft. asunder. A year or so later plant them where they are required to grow permanently. Seedlings do not begin to fruit until they are fifteen to twenty years old.

Walnuts sow, with their shells intact, as soon as ripe, 3in. deep and 6in. apart in drills 18in. asunder. In the autumn of the second year, lift and replant 1ft. apart in rows 3ft. asunder. Two years later lift and replant 3ft. apart in rows 6ft. asunder; and when five years old plant out permanently. They will begin to fruit when about ten years old.

Filberts and Cobnuts store in sand till March, then sow 6in. apart and 2in. deep in rows 1ft. apart. Two years later transplant the seedlings 15in. apart in rows 3ft. asunder. Plant out permanently when five years old. The seedlings commence to bear when eight to ten years old.

Gooseberries and Currants are rarely reared from seed, because a large percentage of the seedlings prove worthless. However, the seeds should be sown in boxes of light soil in a cold frame, or in the open garden, as soon as ripe. Transplant the seedlings as soon as they can be safely handled 6in. apart in rows 1ft. asunder. When three years old plant out permanently. Both begin to bear fruit when four years old.

Raspberry seeds should be collected from ripe fruits, and be well washed in water to get rid of the pulp. Sow them at once in light, sandy soil, in a cold frame. In spring plant out the seedlings 6in. apart in rows 1ft. asunder. The following autumn relift and plant in a permanent position, and cut the canes off close to the ground. In the third year the seedlings will begin to bear fruit.

Strawberries, such as the Alpine kinds, are easily reared from seeds. Separate the latter from the pulp by repeated washings, and then sow them at once broadcast and thinly in a sheltered spot in the garden. Lightly rake the seeds in. Seeds of the choice varieties, saved from fertilised flowers, should be sown in sandy soil, in pots or pans, in a cold frame, as soon as ripe. Transplant the seedlings early 2in. to 3in. apart in boxes, and plant out later in the garden. The former bear fruit the first, and the latter the second year.

Budding.—Budding, or bud-grafting, is a method of propagation employed in the rearing of Peaches, Plums, Nectarines, and Cherries, and also occasionally for the Apple and Pear. It consists of transferring a wood bud from some superior variety of fruit tree to the rind, or bark, of a commoner kind, called the stock. The usual form of budding practised is known as “shield-budding.” It is practised in summer on shoots of the current year’s growth. The advantage of budding Apple and Pear stocks is, if the buds should fail, grafting can be resorted to in spring. The *modus operandi* of budding is as follows:

First of all, the bud is selected from a healthy shoot of the current year’s growth. This should be of a fairly plump nature. With the budding-knife cut out the bud in a semi-circular shape from the shoot, and about an inch in length. Next cut off the leaf, leaving the petiole intact. Now, with the point of the knife, seize hold of the wood under the bud, and pull it away from the rind. If a hole

is seen at the base of the bud, the latter is useless; therefore select a fresh one which shows no hole when the wood is removed. The bud and its shield of bark are now ready, and should be placed in the mouth or in a vessel of water to keep moist until the stock is prepared for their reception.

The next step is to prepare the stock. About two days before the budding is performed, rub off all side shoots that grow nearer than six inches from the soil. Now, with the knife, make a transverse incision in the bark 6in. from the ground, and then an upright one 1in. long, so that the cut represents the letter T. With the bone handle of the budding-knife raise the bark carefully on each side of the cut; then get the bud and insert the lower end of the shield under this, and gently press it down to the base of the vertical cut. If the upper end of the shield projects above the cross cut, cut it off even with the latter. Next get a piece of bast, or yarn, and bind this round firmly, above and below the bud, to exclude the air, and press the inner side of the shield firmly on to the wood of the stock.

The operation is now complete. All that remains is to see that no new shoots form below the bud. In autumn cut the stock back to 2in. above the bud, and a month after budding loosen the ligature to allow the stock to expand. The next year, when the shoot produced from the bud has grown about 1ft. long, cut the main stem back to 1in. above the bud, and in a position sloping away from it, and coat this wound with grafting wax. Budding may be practised from June to September.

Cuttings.—Such fruit trees as Currants, Gooseberries, Figs, etc., are readily increased by cuttings of the ripened current year's shoots. Apple and Pear trees may also be reared from cuttings, but, as trees so reared grow slowly, this method is not practised except for rearing trees for pot culture.

Gooseberry and Currant cuttings should be prepared from shoots about 8in. long. Cut the base off straight

across, close to a joint, and also remove the soft unripened point close to a bud. All buds on the lower half of each cutting should be removed, allowing about three to remain at the top. Open drills about 4in. deep, and put an inch or so of gritty soil in the bottom. Arrange the cuttings 3in. apart in a vertical position along one side of the drill, and then fill up with ordinary soil, and tread down firmly. Do this in September or October, and lift and replant the rooted plants the following autumn.

Cuttings of Apples and Pears should be about 1ft. long, have a base, or "heel," of two-year-old wood attached, and the buds removed from the lower half of each. The prepared cuttings should then be inserted 6in. deep, as advised for currants, taking care to make the soil firm. They should not be disbudded till the autumn of the second year. Insert in autumn.

Fig cuttings should be selected from sturdy, short-jointed shoots, and have an inch or so of older wood attached to their base. Cut off the soft joints to a bud. Insert these so that the upper bud only shows above the soil. October is a good time to put in the cuttings. In severe weather protect the cuttings by a covering of litter.

Mulberries are readily reared from cuttings in autumn. The latter should be prepared from the current year's shoots, a foot or so long, and have about an inch of older wood attached to the base. After removing the soft tips insert the cuttings 6in. deep in firm soil in autumn, and do not transplant for two years. Another form of Mulberry cutting is made by taking a branch about 3ft. long, and inserting this 18in. deep where it is required to grow. This is called a "truncheon cutting."

Raspberry canes of the current year's growth, well ripened, and about 1ft. long, will root fairly freely if inserted in a shady north border in autumn.

Layering.—A simple method of propagation. It consists of burying a portion of a shoot in soil without removing it until rooted from the parent plant: Quince and

Paradise stocks for budding and grafting are reared thus. To obtain a supply of shoots for this purpose in the case of the Quince or the Paradise Apple, trees are cut down to the ground when young, and from the stumps a cluster of young shoots develop. Such trees are technically termed "stools," and they are never permitted to form branches; consequently, as years go on, these "stools" annually yield a crop of shoots. The shoots are bent down in the same manner as a carnation is layered, a notch cut in the underside of the shoot, and a peg inserted to keep it in position, and then covered with sandy soil, leaving the ends exposed. This is done in autumn, and the layers are severed from the parent plant the succeeding autumn.

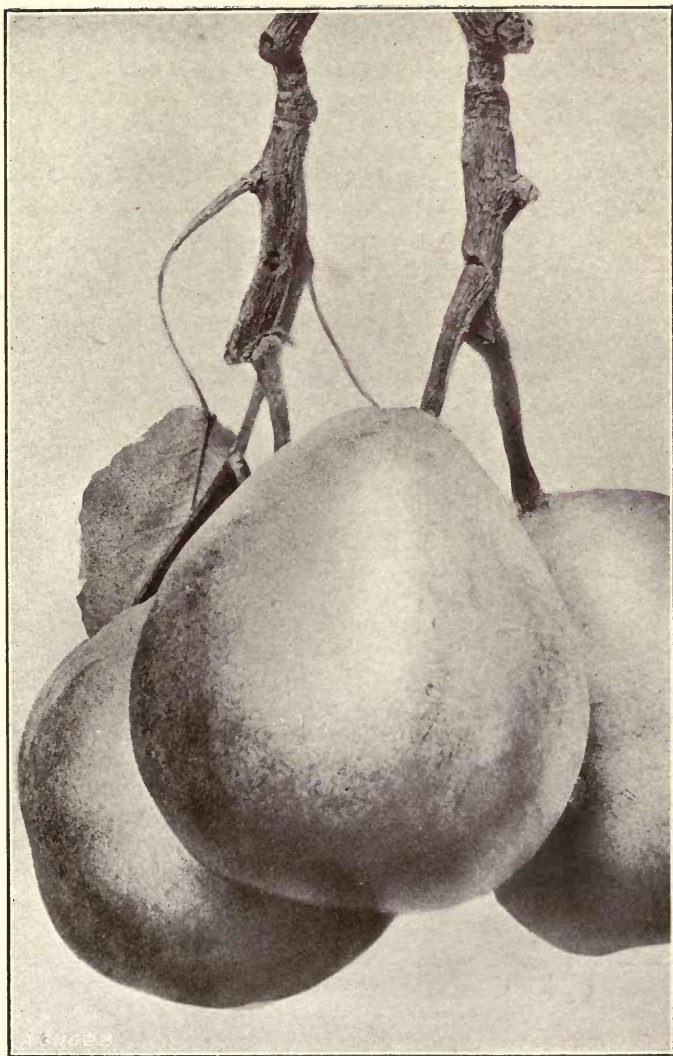
Raspberries, Loganberries, and Wineberries are also layered by simply bending down the points of the shoots to the soil, securing them by a peg, and covering the bent portion with soil.

Strawberries are layered by merely pegging the little plantlets formed on the runners to the surface of the soil. As a rule, one plant only should be permitted to develop on each runner, all others being removed.

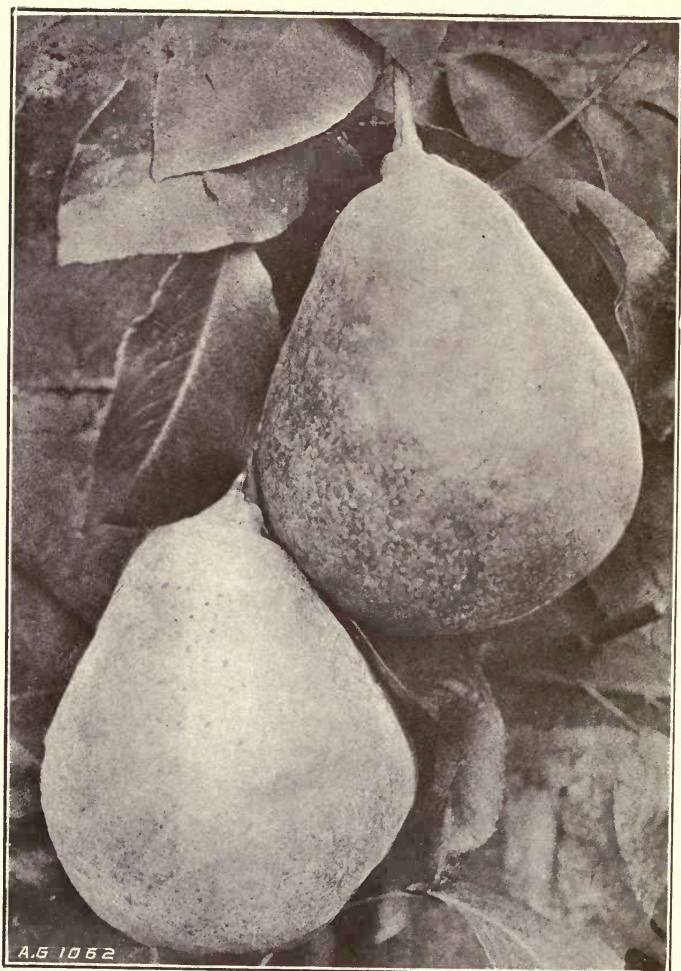
Suckers.—These are shoots which issue from the roots. Some varieties of Plums and Damsons produce suckers freely, but these do not make satisfactory trees, as they are liable later to produce suckers freely. It is different with the sucker growths of the Raspberry and Blackberry; they may be relied upon to produce good healthy plants, and to fruit freely. The same remarks apply to the Filbert and Cobnut.

Grafting.—Mr. J. C. Newsham, F.L.S., contributed the following lucid description, with sketches, on the art of grafting, to the pages of "Farm and Garden," and we cannot do better than reproduce them here:

"The nurseryman who makes a special study of grafting has many objects to bear in mind in order to arrive



DESSERT PEAR, DOYENNÉ DU COMICE.
Season : October and November.



DESSERT PEAR, NOUVELLE FULVIE.
Season: November to February.

at the desired results, and among his principal reasons for grafting are the following:

“(1) To increase the stock of those plants which cannot readily be raised from seeds, cuttings, or other rapid means of propagation; also those which do not fruit freely when growing on their own roots. Thus, when grafted, fruit is produced in the course of a few years, whereas, had the plant been allowed to continue its natural growth, ten or even twenty years might elapse before the tree became sufficiently matured to produce a heavy crop.

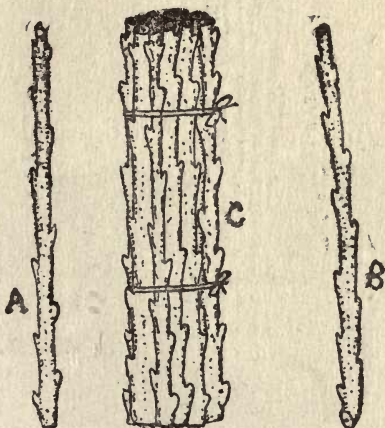


Fig. 78. SCIONS FOR GRAFTING FRUIT TREES.

A and *B*, suitable shoots to form scions; *A*, however, is more preferable because better shaped. *C*, scions tied together.

“(2) To keep the varieties of plants true to their character, as many plants, such as Apples and other varieties of fruits, when raised from seed, revert to types of inferior quality to the parent.

“(3) By the aid of grafting, the natural habit of a plant can be altered, and this process usually takes the form of ‘dwarfing,’ which is so essential to their arrangement and growth in gardens of limited area, and where the sur-

rounding ground is under cultivation. Old trees bearing fruit of inferior quality can be cut down early in the year and regrafted; also espalier and wall trees can be renovated.

“The various stocks used in grafting influence the colour and flavour of fruit, and are also adaptable to a greater range of climate and soil than when the plant is dependent on its own roots. Trees bearing many of the finer flavoured fruits are so weakly constituted that, were

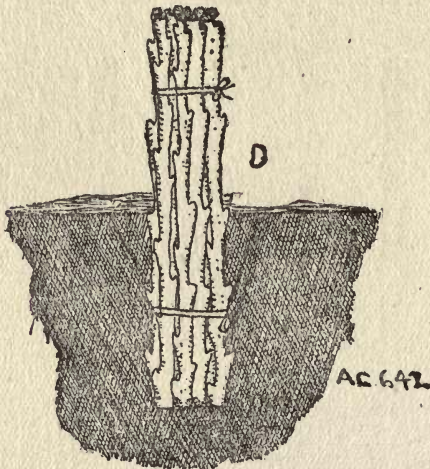


Fig. 79. SCIONS FOR GRAFTING FRUIT TREES.

D, Bunch buried or heeled in the right depth in soil to await grafting.

it not possible to impart strength and longevity by transferring them to stronger-constituted stocks, their cultivation could not possibly be pursued with successful results. Stocks of various kinds can be purchased very cheaply, and are imported in large quantities from the Continent at prices at which it could not possibly repay many home growers to produce them. This, however, is a matter which may be left to the nurseryman, and it is more to

the advantage of growers to purchase what stocks they require from the nursery; and it will suffice to say that all stocks to be grafted should be possessed of strong, vigorous root action; otherwise it cannot be expected that they will produce strong, healthy shoots. Where it is intended to raise standard or espalier Apples, either the Crab or Seedling Apple stock is usually employed, while for bush Apples the Paradise stock is to be recommended. Seedling Pears and the Quince are generally used for

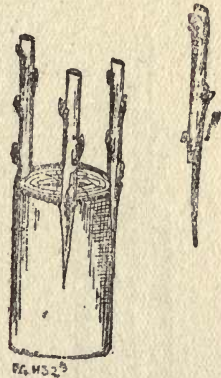


F.G. 1132.

Fig. 80.

WHIP OR TONGUE GRAFTING.

Left-hand figure shows the stock prepared to receive the scion. Middle figure is the prepared scion. Right-hand figure shows the scion fixed in position on the stock



F.G. 1133.

Fig. 81.

CROWN OR RIND GRAFTING.

Adapted for grafting old or large trees. The right-hand figure shows the scion or shoot prepared for insertion in the branch or stock.

Pears; whilst Plums are grafted on the common or seedling Plum and Cherry Plum stocks. The Mahaleb and Wild Cherry are used for Cherries; while for Peaches and Nectarines the Almond is in common use. The Apricot can also be grafted on to the latter stock.

“In the case of young stocks, whip or tongue grafting is usually employed, and can be best accomplished in dull, calm weather. With a sharp knife the graft must be cut

in a sloping direction, the top end of the cut being opposite a bud, as illustrated (Fig. 80). The cut surface must then be placed against the stock, and a cut made in the latter at a similar angle to that of the graft. This cut should be made close to the ground. A notch can then be made in the lower end of the stock, and the extremity of the tongue be securely inserted into it. In order to keep the scion securely in position, and to prevent disturbance by wind, the joint can be bound with raffia, and the whole made secure and air-tight by a thick coating



Fig. 82. CLEFT GRAFTING.

In this method the stock is split open to receive two scions. Not so good a plan as Crown or Rind grafting (Fig. 81).



Fig. 83. SADDLE GRAFTING.

A method suitable for young trees where the stock and scion are of the same size.

of wax or some other suitable composition. Great care, too, must be taken to see that the bark of the scion fits exactly over that of the stock on one side at least, otherwise the two cannot properly unite.

“Crown or rind grafting (Fig. 81) is usually pursued in the case of large orchard trees which have become unproductive. They should be cut back some few weeks before grafting, and, when the operator is about to commence, a further portion of the branch should be cut off,

the cut end being pared over with a knife (Fig. 84). A slit should then be made in the stock between the bark and the wood; and the graft, after having been prepared in the manner illustrated, is inserted. Several grafts may be made in this manner in order to provide against disappointment in one particular case, and, should all the grafts develop growth, the healthiest and strongest must be selected, and the others cut away.

“ Another method is cleft grafting (Fig. 82). The branch

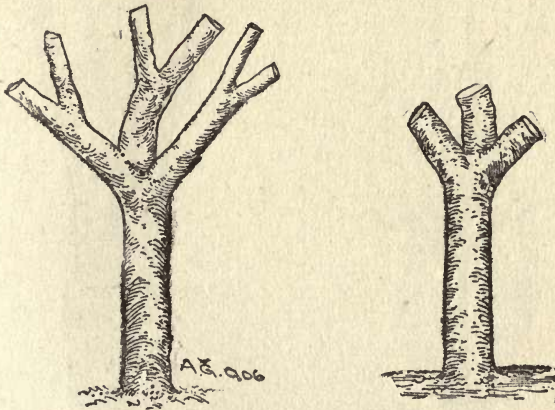


Fig. 84. OLD TREES PREPARED FOR RE-GRAFTING.

Showing the branches headed back in winter to a foot from their base ready for crown or cleft grafting in March.

on which it is intended to cleft graft the scion must be split, and the opening held apart by a wedge. The graft must then be cut in the form of a wedge, so as exactly to fit the sides of the cleft, and the whole joint should be firmly bound and covered with a sufficient quantity of wax to allow the wounds time to heal, and also to exclude decay and insect pests from the inner part of the cleft.

“ Saddle grafting (Fig. 83), as the name implies, is a form of grafting which consists of a scion, cut in the form of a saddle, which fits on to a ‘wedge’ made by

cutting a slice off each side of the stock. Both ends of the graft may be inserted under the ends of the stock, and the whole secured by raffia and waxed over. Young and vigorous wood must be selected for this form of grafting, and it is essential that the stock and scion should be of the same thickness in order that the inner barks may be in their proper position. When grafted in this manner



Fig. 85. RESULT OF GRAFTING AN OLD TREE.

The scions shown are the second year's growth, the first year's being shortened half way the previous winter.



Fig. 86. SIDE GRAFTING.

A simple method of adding a new branch to a tree to improve its shape. The back of the stock is prepared in the same way as for budding, and the scion inserted thereunder.

the young scions quickly grow over the stock, and make very successful plants.

“It will be observed that, after grafting has been performed, the young stocks will put forth buds and shoots, and when the grafts have developed into growth these buds should be gradually shortened back and ultimately

removed. The wax or composition to be employed for the purpose of protecting the cut surfaces or wounds is to be obtained in a variety of forms. Perhaps the simplest form is a composition of well-rotted or rain-washed horse dung, mixed with fine clay to the consistency of wax or putty. The modelling clay known as 'Plasticine' is also useful for this purpose."



Fig. 87. SIDE GRAFT SECURED IN POSITION.

Raffia is used for binding the stick and scion together.



Fig. 88. SIDE GRAFT COATED WITH CLAY.

This is necessary to exclude the air and keep the wound moist.

Side Grafting (Fig. 86) is a form of grafting especially suitable for renovating espalier-trained Apple or Pear trees. Supposing, for example, that a large Pear or Apple tree has lost one of its side branches, it is possible to graft a new branch on the main stem to take its place. Or, on the other hand, assuming that you have a healthy large

tree that refuses to bear fruit satisfactorily, instead of digging up and replacing it by a young tree, the branches can be sawn off to within a foot of the main stem, as is done in the case of old standards and scions whip grafted on the stumps. A tree grafted thus is shown in accompanying sketch. The process is carried out precisely as directed for whip grafting in the ordinary way in above paragraphs. Another method of side grafting is to make a T-like incision in the bark, as is done for budding, and then to raise the bark on each of the long incisions. You next take a small branch about 8 in. long to form the scion, shave off the lower end to a wedge shape on one side, and then gently push this portion under the raised bark, just as would the shield of a bud when budding. All that remains is to bandage the wound round with twine, and then cover all with grafting wax or clay, as shown in accompanying sketches (Figs. 87 and 88). Both methods are easy to carry out.

Time to Graft.—The best time for grafting young trees is in April, and older ones towards the end of April or early in May. The sap is then in a sufficiently active condition to unite to form a callus or union with the scion. The latter, of course, must not be so forward in activity as the stock. The scions (Figs. 78 and 79) should be procured in winter, and buried two-thirds of their length in sand or soil on the north side of a wall to keep the sap dormant.

Subsequent Treatment of Grafted Trees.—As soon as the scions have made new shoots about six inches or so long, the grafting wax or clay covering should be removed and the material used for tying unloosened slightly to allow for expansion of the bark. It is also, as a precaution against injury by wind, a good plan to affix a stake firmly to each scion and its growths.

CHAPTER II.

Planting.

FAIRLY full and concise instructions on the subject of preparing the sites and planting have been given in connection with each kind of fruit, but there are a few important additional points that must be mentioned in this chapter.

Choosing the Site.—Some consideration as to choice of site must be given where an orchard or plantation of fruit is proposed to be formed. As far as possible avoid choosing a site near to a river or lake, or one that is naturally low and damp. The reason for taking this precaution is obvious. Excessive moisture would naturally be deposited on the flowers, and, in the event of early morning frosts occurring, the latter would easily have their delicate organs frozen, and hence be rendered incapable of fertilisation. Cold and bleak uplands should also be avoided, because of the risk of the tender blossoms being injured by cold winds. The ideal situation for forming a fruit plantation is one sloping to the south-west or west, and with ample protection from north and east winds. Even in small gardens the latter precaution is desirable.

Shelter.—Some means of sheltering fruit trees from exposure to north and east winds is imperative. In gardens this may be accomplished to a great extent by high walls, 8 to 10 or 12ft. high; but in the case of fruit plantations it will be necessary, if there are no hills or woods to form a natural shelter from the north and east, to plant a belt of forest trees on the northern and eastern boundaries. The best evergreen trees for forming a

shelter in a few years are the Scotch fir, Austrian and Corsican pines. Excellent trees to mix alternately with the foregoing are the mountain ash, Huntingdon and Cornish elms, birch, Lombardy and balsam poplars, and the beech. Plant 5ft. apart in the first instance, and afterwards gradually thin out as the branches meet, finally leaving the evergreens mainly to form the permanent shelter. Where the exposure is not very serious a row of Damson trees will form an adequate shelter.

Sites for Planting.—Directions have been given for preparing these in the ordinary way. Where, however, the orchard or plantation is an extensive one, and the soil is difficult to deal with, the best plan is to adopt the modern idea of forming them by using explosives. For example, make a hole 3ft. to 4ft. deep in the centre of the site, and then put in a charge of 6 to 12oz. of Curtis and Harvey's "Gelignite," or 7 to 12oz. of their "Cheddite," attached to a safety fuse or to an electric shot-firing battery. On the charge being exploded, the soil will be broken up to a good depth and width, and the only thing necessary twenty-four hours later will be to shovel out the loose soil and plant the tree. This modern method, which is invented by Curtis and Harvey, Cannon Street House, Cannon Street, London, E.C., enables the sites for each tree to be more quickly and thoroughly prepared than is possible in the ordinary way. We advise those contemplating planting fruit trees to a large extent to write Messrs. Curtis and Harvey for detailed instructions.

Drainage.—Land that is at all damp should be thoroughly drained before planting is attempted. To ascertain if drainage is necessary, dig test holes 3ft. deep in various parts of the field. If water quickly collects in these the land needs draining. The drains should be put in 3ft. deep and 15ft. apart. The branch drain-pipes should be 2½in. in diameter, and these be connected to a 3in. main drain. Very damp land would be better drained

with 3in. branch pipes connected to a 4in. main. The average cost of drainage per acre is about £8 to £9. Since draining, to be effective, must be carried out skilfully, we recommend the reader to get an expert to carry out such work.

Treatment of Trees before Planting.—When trees arrive from the nursery they should be unpacked, and if their roots are dry be at once immersed in water for an hour. If they cannot be planted at once, open a shallow trench, place the roots in this, and then cover with soil. During the process of planting do not expose the roots long to the air, but cover them with an old sack or mat. Carefully examine the roots also on arrival, and if any are bruised or damaged cut off the injured portion to a healthy part. Jagged or bruised roots, unless cut off, are liable to be attacked later on by canker.

Depth for Planting.—The general and safe rule for planting is not to bury the stem deeper than the soil mark—that is, the mark on the main stem which shows the height to which the soil attained when the tree was growing in the nursery. This would mean that the top layer of roots would not be buried deeper than about three inches. On heavy or damp soils it is advisable to place the roots level with the surface of the soil, and to cover them with soil so that a shallow sloping mound is formed.

Planting.—In planting spread the roots out equally in all directions, and do not attempt to twist them round to fit the hole; rather take care to widen the hole to allow the roots to be spread out to their full length. Cover the roots, first of all, with fine soil, free from manure, and give the tree a gentle shake to settle the soil about the roots. Add more soil, and then firmly tread it, and finally add the remaining mould, afterwards mulching the surface with strawy manure. Trees to be planted against

a wall or fence should not be planted nearer to the latter than six inches. (Figs. 89 and 90.)

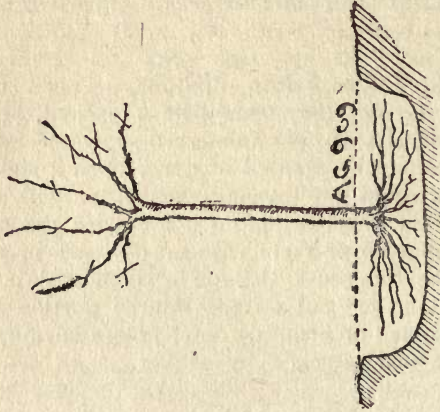


Fig. 90. RIGHT WAY TO PLANT A TREE.

Making a good wide and shallow hole so the roots can be spread out their full length and be within six inches of the surface.

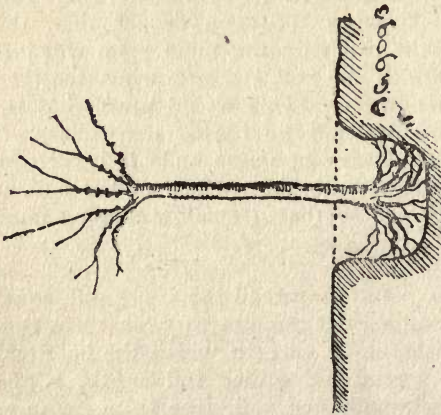


Fig. 89. WRONG WAY TO PLANT A TREE.

Planting too deeply and in too small a hole, thus preventing the roots being spread out properly.

Time to Plant.—The best time to do this is in October or November, but it may be safely done from then up to the end of March, provided the weather be favourable.

It is, however, always the best plan to get the planting done in the first two months; then the trees have a good chance of getting established, and commencing to form new roots before the growing season begins.

Staking Newly-planted Trees.—Trees planted against walls or fences will only require to have their main branches secured loosely to allow for the gradual settling



Fig. 91.

A BADLY STAKED TREE.

Owing to the stem not being properly secured to the stake the head has become bent. To get the tree into proper shape the upper part should be cut back to the cross line.

of the soil. Trees planted in autumn should therefore not be permanently secured until the spring, and those planted in spring not before May, at least. Pyramids, bushes, and standards planted in the open should be staked at the time of planting. Bush trees require a stake about 4ft. long; pyramids the length of the main stem and 2ft. additional length; standards the full length of the main

stem with 2ft. extra. The stakes should preferably be round, about $2\frac{1}{2}$ in. in diameter, and without bark, as this forms a harbourage for insects. In order to render

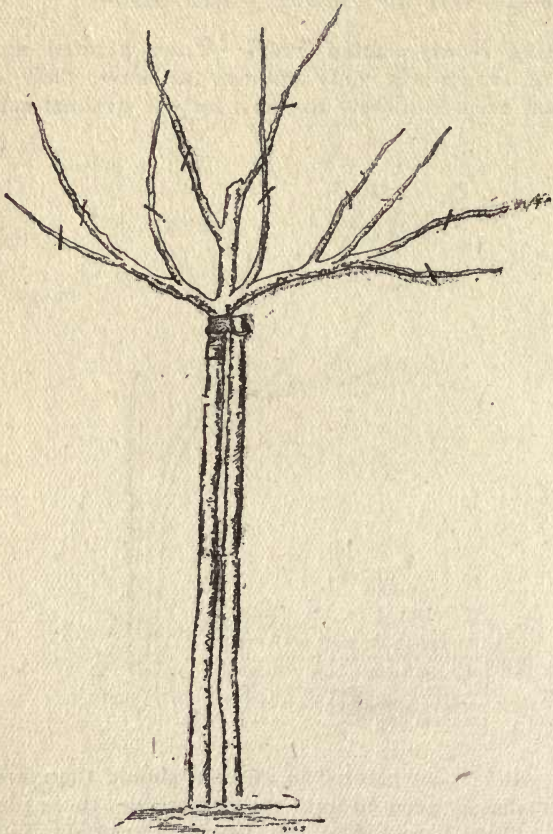


Fig. 92. A PROPERLY STAKED TREE.

them durable for as long a period as possible, they should also be tarred, or, better still, creosoted, before they are

used. For dwarfs and pyramids, one stake driven 2ft. into the ground will suffice; but for standards in exposed positions it is advisable to place three stakes, fixed at an angle of about 65 deg. The upper ends of these require to be brought together at the top of the main stem, a strip of sacking being first wound round the latter to protect the bark from being rubbed by the stakes, and then the stake ends have to be secured tightly by means of stout twine. Another method of staking is to fix three stout stakes in a vertical position, arranged triangularly a few inches apart, secure the main stem to



Fig. 93. "ACME" FRUIT TREE LABEL.

An indelible label made of metal with white raised letters on a black ground.

one of them, and then nail a narrow strip of wood to the tops to hold them securely. Furthermore, to protect the stems from injury by cattle, rabbits, or hares, a coil of wire-netting, with its base buried six inches deep in the soil, should surround them. In all cases the stakes should be placed in position before the roots are covered with soil, in order to avoid injuring the latter. (Fig. 91 and 92.)

Labelling the Trees.—It is most essential that the different varieties should be properly labelled at the time of planting. The paper labels supplied by the nurserymen soon decay, and, unless these are superseded by some of

a more permanent character, the identity of the varieties becomes a matter of conjecture, if not a loss. The best of all labels for fruit trees is the "Acme" (Fig. 93). This is made of zinc, with raised white letters on a black ground; and, if it is secured to the branch by means of copper wire, it will last as long as the tree. It is neces-

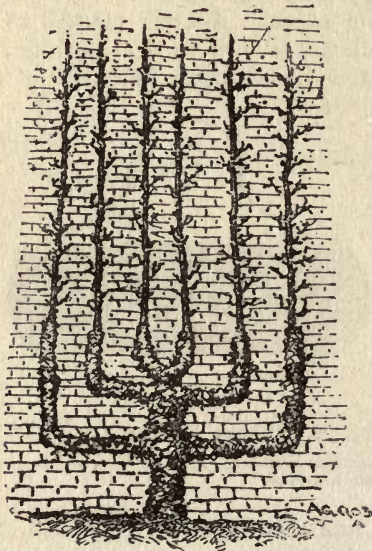


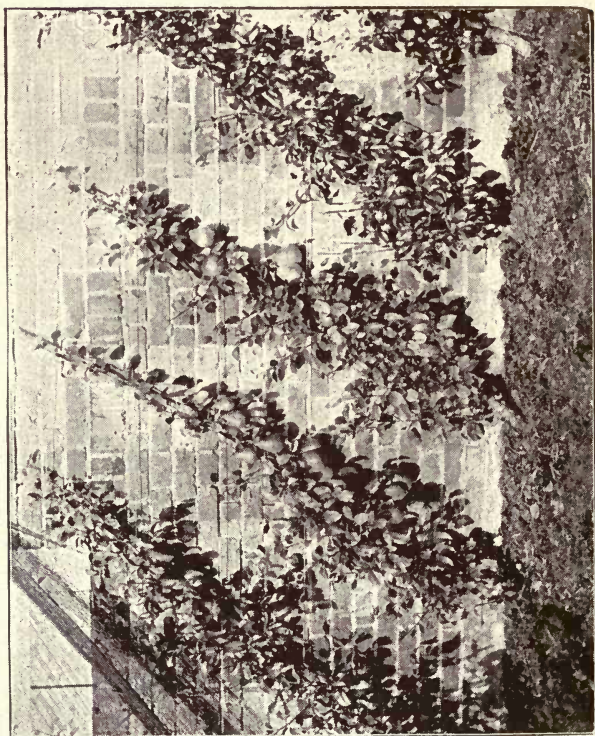
Fig. 94. PRESERVING NEWLY-PLANTED TREE.

A large gridiron trained Pear Tree which had been transplanted to a new position. In order to keep the bark moist and assist the tree to recover from the removal, the trunk and lower branches were encased in hay bands, these being kept constantly moist. From a photograph taken by the author in Holland.

sary, however, to examine the wire ligatures from time to time to see that, as the branch increases in size, the wire does not cut into the bark. It is advisable in the first instance to so arrange the ligatures that ample space is allowed for swelling of the branch. Another method is to get some zinc labels, burnish the face of these quite



A THREE-YEAR-OLD BUSH-TRAINED APPLE TREE.
Early Victoria.



CORDON-TRAINED PEAR TREES.

bright by the use of emery cloth, and then write or neatly print the name thereon by means of a quill pen and special ink. The latter is prepared as follows: Verdigris, two drachms; sal ammoniac, two drachms; lamp-black, one drachm; water, four ounces. Mix well in a mortar, and then store in a glass-stoppered bottle. Another recipe is: Mix a small quantity of sulphate of copper in a little water, and, after burnishing the label, write the name by means of a quill pen. Either will remain indelible for very many years.

Concrete Foundations.—When fruit trees are grown against walls—or, indeed, in the open air—and the sub-soil is of heavy clay and probably very damp in nature, it is desirable to guard against the roots descending into this by concreting the base of the site. The holes should be cut out about 4ft. deep. In the bottom place 6in. of rough rubble, and arrange for a 2½in. drain to be connected therewith, and to pass away to the nearest main drain. Over the rubble lay down a bed of concrete 6in. deep in the centre, but gradually sloping away to 3in. at the sides. Such a concrete base should be not less than 6ft. square for each tree. Over this place the compost. Remember that it is not of much practical use to make such foundations unless provision is made to carry off the water.

CHAPTER III.

The Principles of Pruning.

HAVING already described in detail the methods of pruning applicable to each kind of fruit, all that remains for us to do in this chapter is to deal with the general principles of the art.

Object of Pruning.—First of all, let us deal with the object of pruning a fruit tree. Primarily, we prune a tree for the purpose of training it into a given shape, as explained in Chapter II. Secondly, we continue to do it in order to ensure the maintenance of that shape; and, thirdly, for encouraging the production of new growth or fruit buds. Each method, or object, has its own special significance, and each has to be undertaken with skill and judgment. The skilled gardener knows by experience the effect of removing a branch here or shortening one there, and he acts accordingly. The non-skilled person, as a rule, proceeds to prune by “rule of thumb” —in other words, according to a vague conception of attaining what he desires—and it is he who inevitably fails to attain his ideal. For that reason we must explain as clearly as we can the definite reasons for the summer pruning and the winter pruning of the shoots and branches; also the pruning of the roots.

Philosophy of Pruning.—A healthy tree has, as a rule, a rooting capacity equal to the vigour of its branches. If, therefore, we severely prune the branches, and do not at the same time restrict the growth and number of the roots, a reciprocity, or perfect balance, between branch and root is wanting, and we find the latter is capable of transmitting more food to the former than its limited



Fig. 95. HOW TO SUMMER-PRUNE AN APPLE TREE.

1. A branch of summer-pruned—*A*, Leader not to be pruned; *B*, Where to prune; *D*, Wrongly made cut causing a new inward growth. 2. A branch summer-pinched—*A*, Leader unpinched; *B*, Where to pinch. 3. Result of pinching producing inward or outward shoot.

number of shoots and buds can utilise. The superabundant sap must therefore find an outlet for its energies, and hence, directly growth begins in spring, it forces the awakening buds into vigorous activity, and the result is a still more vigorous growth of coarse shoots. These shoots, full of watery sap, continue to grow, and in their

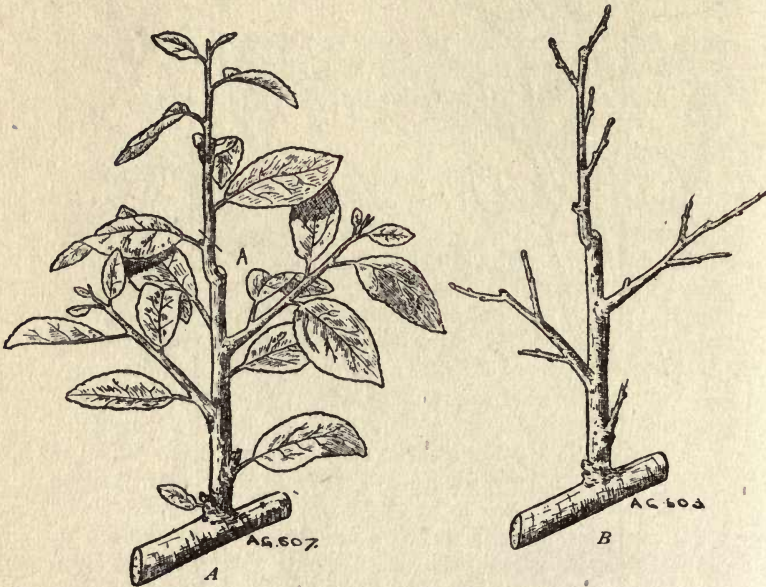


Fig. 96. A LESSON IN PRUNING FRUIT TREES.

A Shows a side shoot pruned in winter to four buds. Result, three lateral shoots which, if summer-pruned to the fourth leaf, will in due course produce three or further laterals the next season as shown at *B*.

turn form fat wood buds all along their length. Few, if any, of them mature properly, and fruit buds have, in consequence, little chance of developing. In winter these shoots are again pruned severely to keep the tree within due bounds, and still the same result is achieved, with the

additional disadvantage of a still stronger and more numerous root formation. It is an impossibility under such conditions to get a tree to bear fruit.

Every year we meet with espaliers or fan-trained trees



Fig. 97. SIDE BRANCH OF AN APPLE TREE.

As the result of winter-pruning three strong laterals have developed, but no fruiting spurs. These, however, if summer-pruned in August to check exuberant growth and then not too closely pruned in winter might be induced to form fruit spurs.

growing on low fences that literally produce faggots of shoots but hardly a single fruit bud, because the owner neglected in the earlier existence of the tree to see that the roots were pruned as well as the branches, to main-

tain a proper balance between the two. We see, too, in gardens standard trees, pyramids, and large bushes that have their young growths barbarously cut off, like the



Fig. 98. ANOTHER SIDE BRANCH OF APPLE TREE.

This, unlike Fig. 97, has developed fruit spurs at the base of its own accord. Such variations occur in many varieties of the Apple and Pear.

hair on a convict's head, and which never bear fruit for the same reason. These are instances of want of knowledge of the true principles of pruning—sheer crass ignorance, in fact.

The reader will therefore clearly see that one of the most essential principles in pruning is to keep both root and branch in their proper ratio to each other. This assured, he may then proceed to practice summer and winter pruning with a view to the production of fruit



Fig. 99. FRUITING BRANCH OF RED CURRANT.

Showing fruit borne on old spurs, and the summer-pruned laterals.

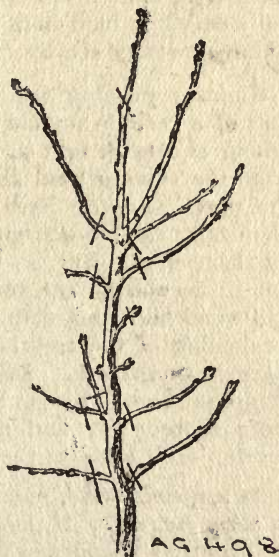


Fig. 100. BRANCH OF RED CURRANT.

The short lines show where to prune the lateral and leading shoots; in the former case to form spurs.

buds, fruiting spurs, and the maintenance of healthy growth, to keep the tree growing in a prosperous condition. We will now pass on to the consideration of the several methods of pruning.

Summer Pruning.—This is practised on dwarf trees worked on dwarfing stocks; also on trees grown on walls which it is desired to encourage to become and continue as fruitful as possible. It ought never to be practised on standards, because, owing to their extensive root action, they require all the growth possible to assimilate the food collected by the latter. It would only encourage them to become producers of wood rather than fruit. A standard tree, once it has arrived at its bearing stage, naturally develops fruit buds on its previous season's growth, as anyone may see by examining the shoots on the tree.

Summer pruning the shoots results, it is true, in the loss of a certain amount of food to the tree, because the young shoots at first are drawing their chief sustenance from the reserve food stored previously in the cells, and the parts removed have not had an opportunity of replenishing the store from the food manufactured later on by themselves. But, as the object of summer pruning is not to encourage the too extensive formation of shoots and wood buds, but rather plenty of fruit buds, this slight weakening of the tree is an advantage; it checks excessiveness in growth. Instead, therefore, of getting very vigorous shoots, we get short, sturdy ones, which mature more thoroughly, and are consequently more likely to develop fruit buds at their base.

As a general rule, summer pruning is best done in July or early August. If done earlier the force of the ascending sap may encourage secondary shoots to develop, and so prevent the food present in the cells concentrating its energies upon fattening the basal buds to become fruiting ones. You then pinch off the shoot to the fourth leaf; and, if all goes well, the food in the leaves will, before they fall, return to the cells of the buds the special food they require to form embryo blossoms. This pruning not only checks exuberant growth, but it also admits more sunshine and air to the parts remaining, and these ripen more thoroughly. (Figs. 95 to 99)

Winter Pruning.—Assuming summer pruning to have been skilfully done, winter pruning will not be a serious matter. It will consist mainly of shortening the leading shoots more or less to maintain the tree in the desired

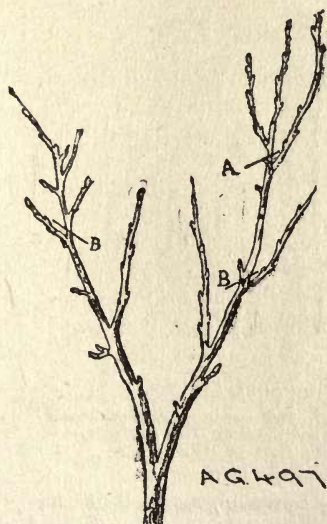


Fig. 101. A BRANCH OF BLACK CURRANT.

Prune either to *A* or *B* to encourage new shoots to develop below.

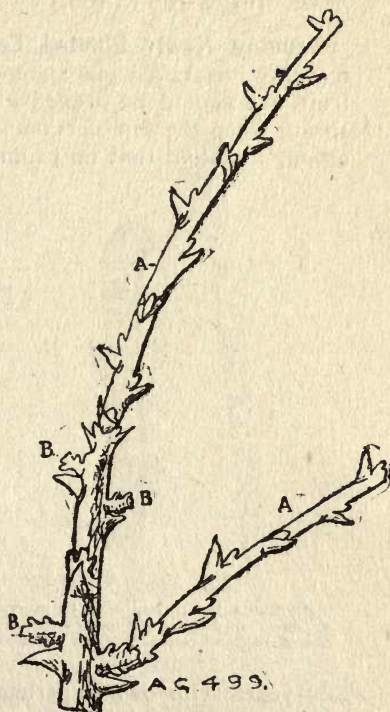


Fig. 102. GOOSEBERRY SHOOT PROPERLY PRUNED.

A, Lateral shoot and leading shoots properly shortened. *B*, Laterals cut back to two buds to form spurs.

shape. The summer-pruned shoots will also need to be cut back to the second bud to promote the formation of artificial fruit spurs. Branches here and there may need

regulating, especially in the case of bush and standard trees, so as to keep the centres well open, and prevent branches crossing each other. The precise methods have, however, been described in connection with each kind of fruit. (Figs. 100 to 102.)

Pruning Newly Planted Trees.—A good deal of controversy has taken place among experts as to whether a fruit tree should be pruned at the time of planting or in spring when the sap has commenced to circulate. Others, again, maintain that no pruning should be attempted the

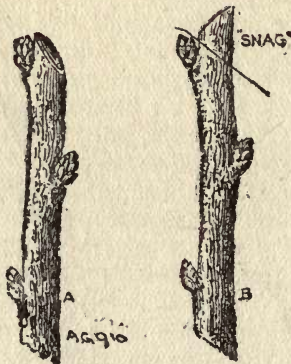


Fig. 103. A LESSON IN PRUNING SHOOTS.

A. Shows the correct way to prune. *B.* The wrong way, thus leaving a "snag" or portion of shoot extending beyond the bud. This portion dies in due course, and causes decay of the shoot.

first year. Our own experience, however, as well as that of many successful fruit-growers, is that pruning should be practised the first year, not, however, at the time of planting, but about April, when the sap has begun to circulate and the buds to develop. It is possible then to readily distinguish which of the many wood buds on the shoots are most likely to develop into a strong, healthy shoot, and hence to prune back to this. Wood buds which appear to be fairly plump and promising in winter may

shrivel by spring, and if the shoots were shortened to these weakly growth would be the inevitable result. On the whole, therefore, we maintain that it is wise to defer the pruning of trees planted in autumn or winter until the sap begins to circulate freely.

Points to Observe in Pruning.—In pruning a shoot, special care should be taken always to cut back to a wood

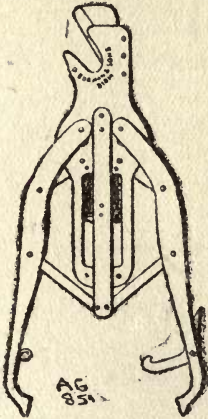


Fig. 104. BARROW'S PATENT PRUNER.

A strong and useful tool for pruning trees in winter. Cuts with a knife-like action and does not bruise the shoots.

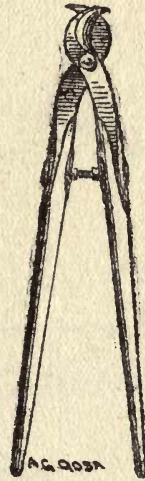
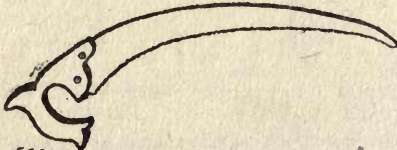
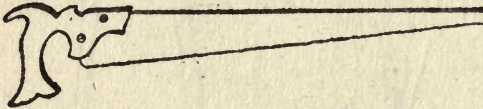


Fig. 105. POWERFUL PRUNING SHEARS.

Useful for cutting off strong branches. Known as Aubert's Pruning Shears. A French invention.

bud pointing outwards, so that the future shoot may develop in the right direction. The cut, too, should be made close to the apex of the bud, and with a slight slope behind it. Never make the cut below the apex of the bud, nor leave a "snag"—i.e., a portion extending far above the bud—as this piece of wood will gradually die owing to

there being no leaves beyond to draw up the sap. Use a keen knife in all cases, and if a saw has been used



FC 9637.

Fig. 106.

Fig. 106. PRUNING TOOLS.

A good type of pruning knife, parrot and puffin-bill secateurs, and a straight and curved pruning saw.

Fig. 107. "STANDARD" TREE PRUNER.

A useful tool made with a handle varying from four to ten feet in length. Admirably adapted for pruning tall trees.



Fig. 107.

to sever a root or branch, neatly trim off the edges to make a clean wound. It is advisable to paint all large

wounds with an antiseptic like Stockholm tar; then they will heal more quickly. (Fig. 103.)

Tools Used in Pruning.—The first essential is a good folding clasp-knife. There are two kinds, one with a straight and the other with a curved blade, each fitted with a stag's-horn handle. Then a pair of secateurs come in useful for pruning Gooseberries, Red and White Cur-

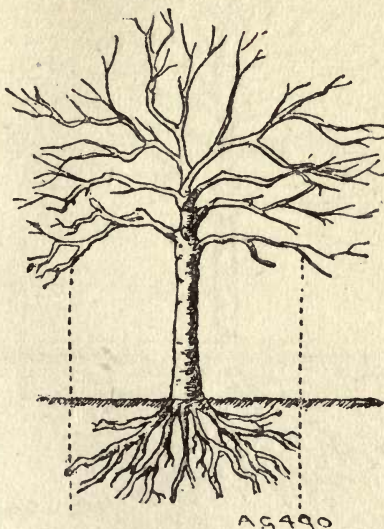


Fig. 108. WRONG WAY TO ROOT PRUNE A TREE.

Severing the roots too close to the trunk, and thus sacrificing the fibrous ones Result, a severe check to future growth.

rants, and the best form is that with two cutting blades. A saw, too, is indispensable for cutting off large branches. The American curved saw is a most useful form for general use. Tree pruners, fitted with long handles and operated by a lever, are indispensable for pruning large trees, as the pruner can remove branches without ascending the tree. (Figs. 104 to 107.)

Root Pruning.—This is a form of pruning which has for its main object the removal of tap roots, and also the shortening of too-vigorous lateral roots, so as to encourage a tree to make more fibrous roots, and hence render the branch growth more sturdy and fruitful. Root-pruning is imperative in the case of cordons, pyramids, bushes, and wall-trained trees, to check rank root growth

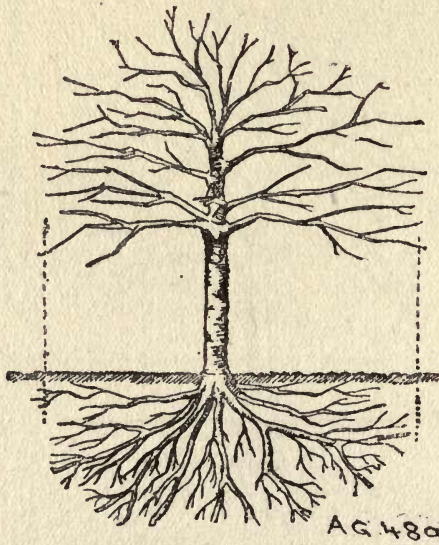


Fig. 109. RIGHT WAY TO ROOT PRUNE A TREE.

Severing the main roots at a point equal to the circumference of the branches, as shown by dotted vertical lines.

and promote fruitfulness. Cordons, bushes, and pyramids are all the better for being lifted every third year, having their vigorous roots shortened, and then replanted. Exuberant shoot growth is then restricted, and trees so treated bear all the more freely.

Dig out a trench about 3ft. from the stem, carefully work away the soil until the tree can be lifted, then

shorten the strong roots about half way, but not the fine fibrous ones, and then replant. Treat cordons similarly. Fan-trained and espalier trees that are making a too free

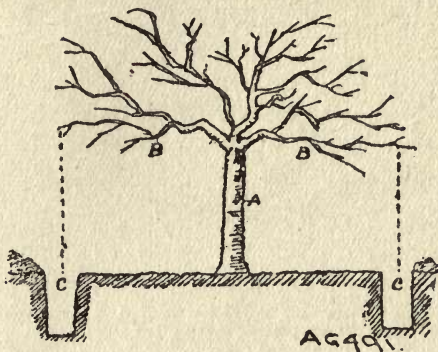


Fig. 110. RIGHT POSITION TO OPEN TRENCH.

First dig out a trench as at C, then gradually fork away the soil towards the trunk B B until the position B B be reached.

growth treat as follows: Open a trench 4ft. from the stem, gradually work away the soil, shorten any vigorous shoots 3ft. from the stem, then tunnel under the main stem and

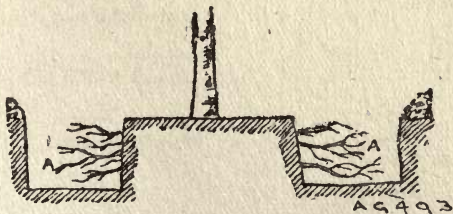


Fig. 111. SECTION OF TRENCH PROPERLY OPENED.

A A are the fibrous roots which it is essential to preserve intact.

sever any vertical or tap roots. This advice applies to old trees. Trees up to five or six years old should be lifted, root pruned, and replanted, as advised for pyramids.

Standards or very large bushes, or pyramids, cannot be safely lifted; hence must be treated differently. Thus, a trench should be opened at a point equal to the circum-

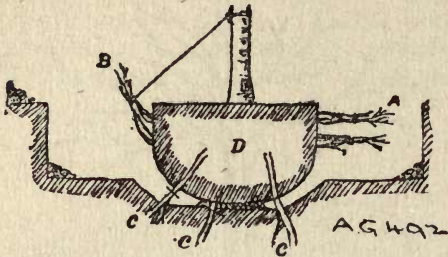


Fig. 112. PRUNING THE TAP ROOTS.

A and *B*, Fibrous roots tied in bundles to prevent them being injured. *C*, Tap roots which require severing at base of tree *D*.

ference of the branches. Only half the roots should be treated thus the first year, the remaining half being deferred to the next season. Continue to dig down in the

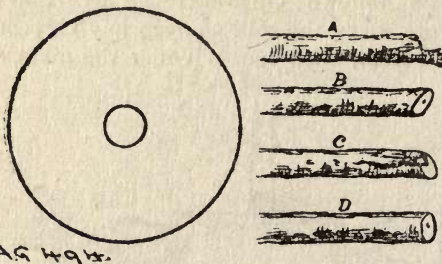
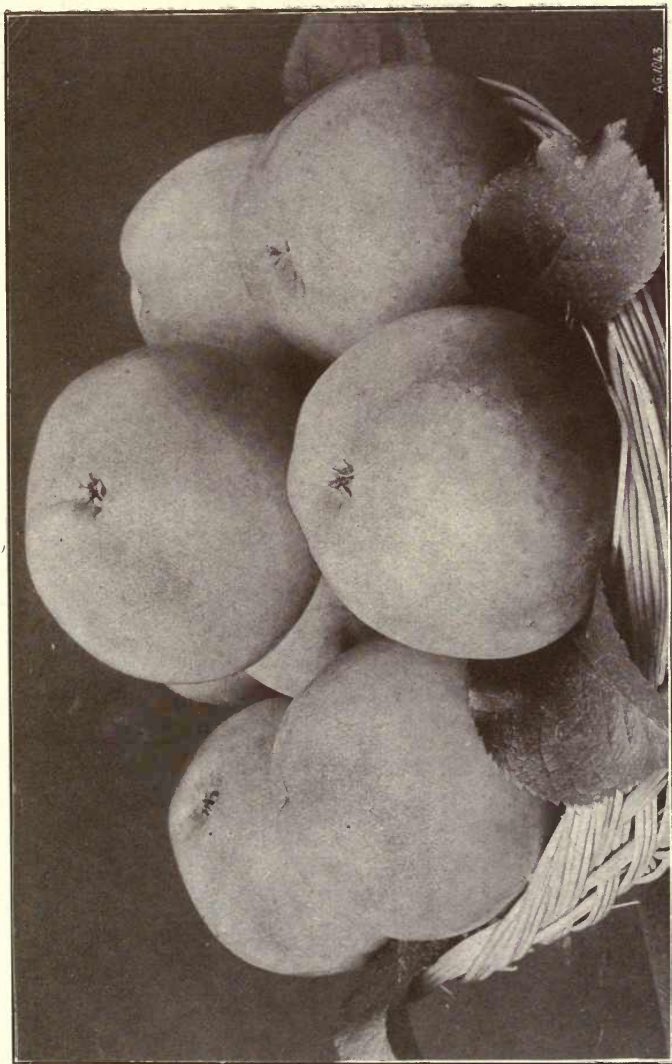


Fig. 113. RIGHT AND WRONG WAY OF PRUNING ROOTS.

A, Roots with jagged bruised end. *B*, Pruned the wrong way. *C*, Not pruned far enough back, thus leaving a fracture susceptible to injury by fungi. *D*, Correct way to prune. The circle indicates the proportionate width of trench from base of tree.

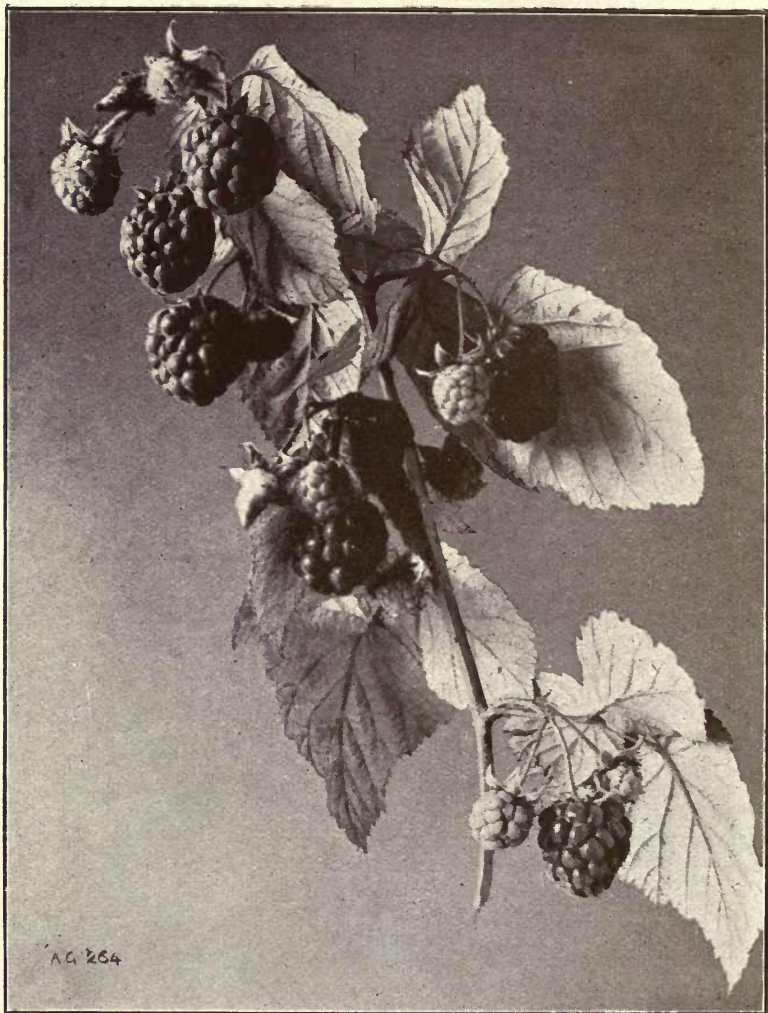
trench, and then sever any thick roots that cross it, carefully preserving all fibrous ones. Next tunnel underneath to the centre of the trunk, and, if any vertical roots are



AG. 0043

CULINARY APPLE, KING'S ACRE BOUNTIFUL.

Season : September to November.



AUTUMN-FRUITING RASPBERRY, OCTOBER RED.
Season: October.

discovered, sever them. After this is done replace the soil, carefully spreading out the roots, and adding manure and compost to enrich the existing soil.

The proper season to do root pruning, lifting, and transplanting is during October, not later. Readers will find, if they pay attention to the advice herein given, that their trees, instead of producing a superabundance of gross wood, will yield a moderate growth and an abundance of fruit. Remember, finally, the golden rule to preserve an even balance between root and branch, and better results will be the ultimate reward. (Figs. 108 to 113.)

CHAPTER IV.

Training Fruit Trees.

THE proper training of a fruit tree from its earliest infancy to its mature condition is an operation of the greatest importance. The future success of the tree or bush, indeed, depends mainly on the way it is trained from the earliest stage of its existence. Once neglect to lay a proper foundation, and the subsequent results will prove most unsatisfactory. Hence it is essential, in a practical work of this kind, that we should deal with the general principles of the art of training, so that the reader may go the right way to work to obtain a well-balanced, symmetrical tree or bush. We will therefore proceed to describe the usual methods of training the various shapes of trees in general cultivation.

Cordons.—This form of training is applicable to Apples, Pears, Plums, Cherries, Gooseberries, and Red and White Currants. Three kinds of training are practised—the single, double, and the horizontal.

The single, or ordinary form, consists of a main stem without side branches, but furnished with fruiting spurs. Commencing with a maiden tree grafted in spring, this is allowed to produce a single main shoot the first season; it is then, in winter, pruned back about half-way. The second season a leading shoot forms at the apex, and this is permitted to grow, any side growths forming being shortened to the third leaf. The new young main shoot may have its point pinched off about June, and this will induce a second young growth to form, which allow to grow. In winter shorten the main shoot half-way. The third year again allow one young shoot to grow at the apex, and all lateral or side growths shorten to the third

leaf. The tree will now be well furnished with fruiting spurs, and commence to bear fruit. Future treatment will consist of summer pruning the lateral growths, and, if the tree should have reached the height desired, of shortening the main shoot also.

Double cordons are formed by allowing two young shoots to develop after the maiden tree has been pruned the first time. If one should attempt to take the lead, nip off its point, but let the other grow. In winter prune the two, as advised for the single cordon; again keep an eye on the young growths, and do not allow one to get in advance of the other. The next winter prune as before, and permit each stem to develop one shoot on each at the apex, and keep all laterals summer pruned. The tree will then arrive at its fruiting stage.

Horizontal cordons are formed in a similar way, except that the maiden tree is best planted at an angle of 45 deg. Strong wires should be fixed about 1ft. from the ground, and the main stem pruned to this. In spring allow two shoots to grow, and train one each way along the wires. If one takes the lead remove its point. In winter shorten each slightly, and allow a young shoot to grow at the apex of each. Any laterals that form pinch to three leaves. Proceed similarly each year until the tree has filled its allotted space.

Pyramid.—This is a suitable method of training Apple, Pear, Plum, and Cherry trees. Commence with a maiden tree, grafted the previous spring, by pruning it back in winter to about seven buds—or, say, 1ft.—from its junction with the stock. The next spring several side shoots and one leader will develop. Place a stake to the leading shoot to keep it upright and safe from injury by winds. In winter prune the leader back one-third, and the side or lateral shoots about half-way. To ensure a perfect pyramidal outline, however, the lower shoots should be left a trifle longer than the upper ones, so that the tree, when pruned, assumes a cone-shape. The third season will

produce a tree with many lateral shoots, and these must be carefully watched. At least three new laterals will form on the previously-shortened growths. One must

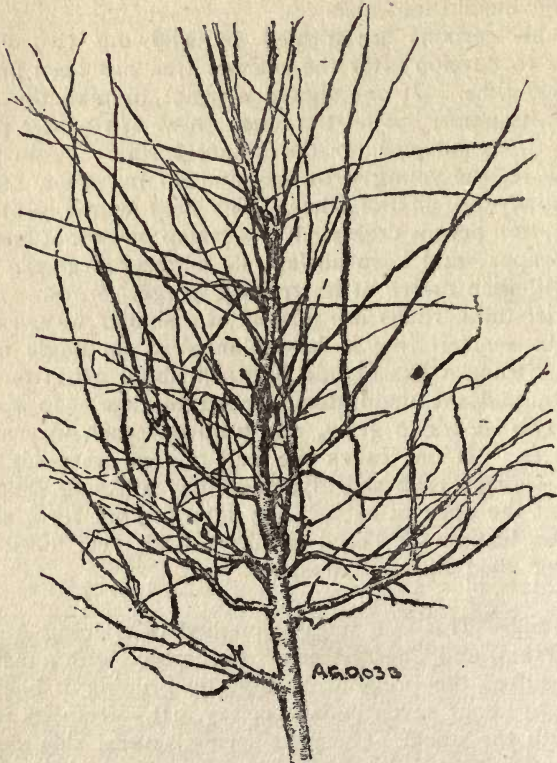


Fig. 114. A PYRAMID APPLE TREE BEFORE PRUNING.

The variety, "Stirling Castle," is a free grower and also requires occasional root pruning to check excessive growth.

develop on each of the latter as a leader to extend the size of the tree. Examine the others, and if it is seen that, by leaving them, the tree will be overcrowded, pinch

them back to the third leaf to form fruiting spurs. When winter arrives prune the main leader back a third and the leading branch shoots to 6in. or 8in., according as may be required to form a correct pyramidal outline.



Fig. 115. A PYRAMID APPLE TREE AFTER PRUNING.

Above shows the preceding tree (Fig. 114) after it has been properly pruned.

Laterals, too, shorten to 3in. or 4in., according to space. In future years the trees will require to be summer and winter pruned, as advised in connection with each kind of fruit in the earlier part of this book. (Figs. 114 and 115.)

Bush Trees.—Apples, Pears, Plums, Cherries, Gooseberries, Red, White, and Black Currants are grown in bush form, and trees so grown usually take up less space, and are more easily trained, than the formal pyramids.

In the case of Apples, Pears, Plums, and Cherries, maiden trees require to have their main shoot shortened in winter to five or six buds. These buds produce shoots the following year. The leading and side shoots thus



Fig. 116. PREPARED CUTTING OF BLACK CURRANT.

Two lower growth buds only removed.

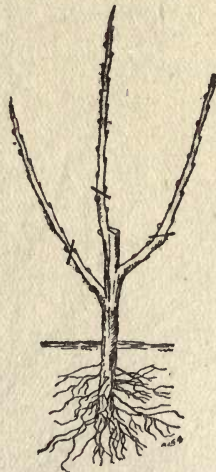


Fig. 117. MODE OF TRAINING A BLACK CURRANT TREE.

"Maiden" tree with first year's growth. Lines indicate where to prune.

formed have to be shortened in winter to about the same length—namely, one-fourth. The third year further laterals, as well as a leader, are produced. One should be allowed to grow at the apex and one at the extremity of each branch, all other laterals being shortened to the fourth leaf. Subsequent pruning should consist of shortening the leaders to four, six, or eight inches, and the

summer-pruned laterals to a couple of buds. This system keeps the branches fairly open. Some gardeners, however, allow lateral shoots to grow, and shorten these to four or six inches in winter.

Gooseberries and Currants require the following treatment. When the cuttings are inserted, all buds except the upper three are usually removed. These buds in due



Fig. 118. MODE OF TRAINING A BLACK CURRANT TREE.

Second year's growth. Lines show where to prune.

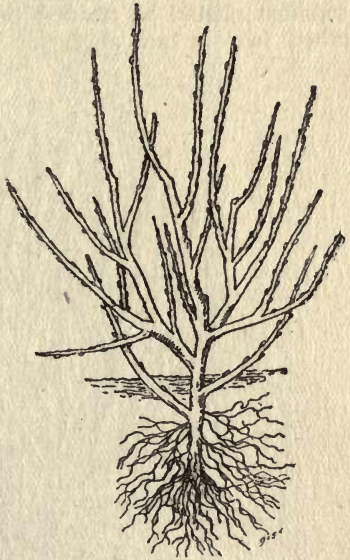


Fig. 119. MODE OF TRAINING A BLACK CURRANT TREE.

Third year's growth. No pruning required.

course produce three shoots, which are permitted to grow, and in winter are pruned back half-way. The following season double or treble the number of shoots are formed. These shorten, in winter, to about 4in. or 6in. The next year all side or lateral growths, except in the case of Black Currants, summer prune to 3in., and further

shorten in winter to an inch to form fruiting spurs. Subsequent pruning is dealt with in the cultural articles. (Figs. 116 to 120.)

Espalier Trees.—This system applies to Apples and Pears. Assuming a tree grafted in March to have made one strong shoot by winter, shorten this to 1ft. from its base. Three shoots will develop in spring, and the topmost should be trained vertically to a stake, and the other two at an angle of about 45 deg. to a frame-

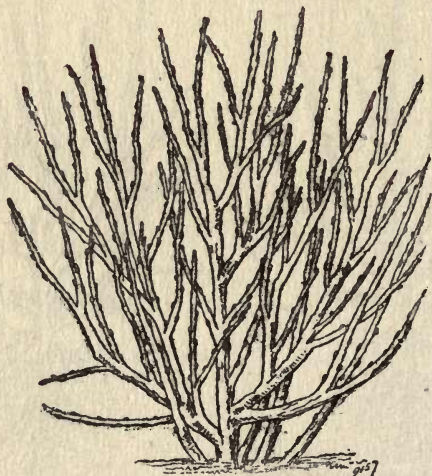


Fig. 120. MODE OF TRAINING A BLACK CURRANT TREE.

work of stakes. In winter prune the central shoot to 1ft. from its base. Do not prune the two side shoots, but leave them as they are, and in the same position. Any lateral growths which may form, pinch back to the third leaf. The next season three more new shoots will develop. Train the central one vertically, and one on each side at the same angle as before. Again shorten the leader to 1ft. in winter, and then depress the two lower

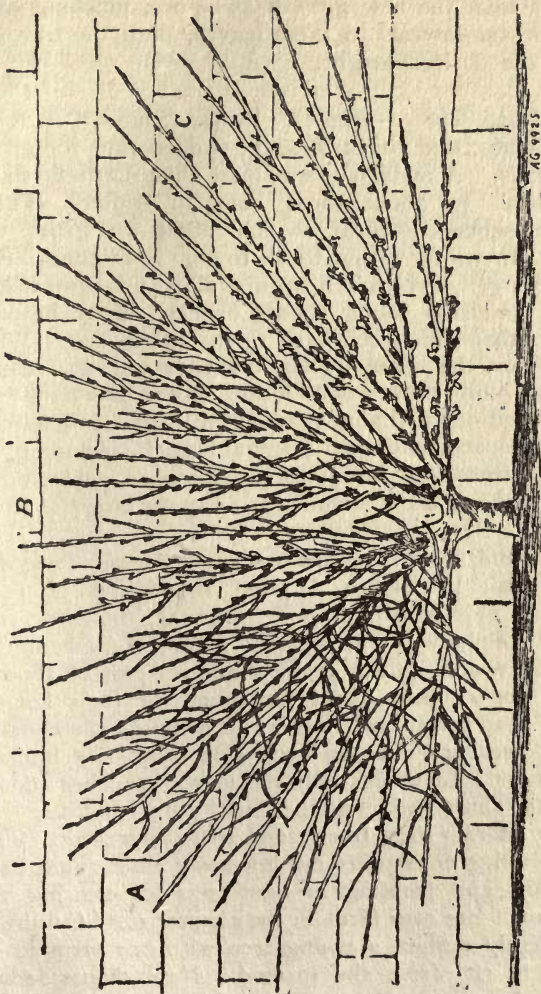


Fig. 121. A FAN-TRAINED PLUM TREE.

A, Shoots allowed to grow wild and not properly summer-pruned. *B*, Branches with laterals for training in to extend size of tree. *C*, Properly trained branches furnished with fruiting spurs.

first-formed side branches to a horizontal position. The next year treat the new growth as before, pinching back laterals or sub-laterals to three leaves, until the tree has attained the desired height.

Fan-trained Trees.—Apples, Pears, Plums, Cherries, Figs, Peaches, and Nectarines are trained thus for growing on walls. A maiden tree should have its main shoot pruned back to about three buds in winter. Three shoots subsequently form, which allow to grow unchecked. In winter prune these to 6in. from their base; and in spring, when growth begins, allow a central leader to grow, and two young shoots on each lower branch; any others that form pinch back to the fourth leaf. When winter arrives, the lower duplex branches will not require shortening, only those that form above, including the leader. Continue a similar method until the tree has filled its allotted space, and each original branch, including the leader, is furnished with duplex sub-branches, each clothed with spurs, the result of summer pruning the laterals. (Fig. 121.)

Peaches and Nectarines are treated in the same way for the first year to ensure a good foundation of main branches. The resultant new growths, however, are spread out equally in the form of a fan, there being no leader. In winter do not prune the lower pair of shoots, only the upper ones, about one-fourth of their length. The next year permit two leaders to grow at the ends of the two lower branches on each side, and only laterals on the others. In winter only the upper branches should be slightly shortened, together with any laterals. A year later laterals form freely, and these bear fruit. Subsequent pruning consists of cutting away shoots that have borne fruit, and training in new ones for bearing the next season. See also hints in the chapter on "Culture."

Figs merely require a young tree with one stem to be cut back to 1ft. from the ground. New shoots, when about 1ft. long, must have their points pinched out, the

result being further shoots; and so on, until a full-sized tree is obtained.

Standard Trees.—Commencing with a maiden tree, train the main stem to a stake until it has attained the desired height in the second year. Do not remove any side shoots that may form on the stem, but pinch these back to the fourth leaf in early autumn. When, in the second year, the main stem is long enough, pinch off its point in early summer. Laterals will then develop to form the foundation of the future head. In winter cut clean away all stem laterals, and also shorten the leaders to three buds. The following winter prune the previous summer growths to 6in. or 8in. The tree will henceforth require no further pruning beyond keeping the centre well open, and shortening or removing any branches which cross each other.

Nuts.—The Kentish system of training Cobs and Filberts is as follows: Starting with a rooted layer or sucker, shorten this to 18in., and remove all buds except the upper three. The next season three shoots will form, and in winter the three must be shortened to three eyes. Six shoots will develop the following season, and these should be trained at equal distances in a globular form by securing them to hoops placed inside. Subsequent treatment consists of shortening these in winter, and training further leaders the next year, and in summer pruning all side growths to six leaves.

There are other fanciful methods of training fruit trees, but as these are not in general demand we shall not waste space in describing the methods of producing them. Those who want gridiron, goblet, palmette-verrier, and other fanciful modes of training are advised to purchase them ready-trained from the nurseryman.

CHAPTER V.

Manuring Garden Trees.

THIS is a subject of very great importance in relation to the successful cultivation of hardy fruits. Next to skilful planting, pruning, and training, a knowledge of the requirements of each kind of fruit, as regards the special food it requires as an aid to successful growth and successful fruit-bearing, is most essential. The grower, indeed, requires to know the effect of the various manures or fertilisers upon the production of healthy growth and the development of fruits. It is a very easy matter to use manures to excess, and to defeat the very object the grower has in view, and it is equally easy to starve a tree by not giving it the food most suitable for its requirements. Our duty, then, in this chapter, is to set forth the various facts about manures and manuring in as simple a form as possible, so that mistakes may be avoided and success assured.

Mistakes Made in Manuring.—Novitiates in fruit culture too often make the mistake of imagining that liberal applications of manure will resuscitate a sickly tree, and bring it into a healthy and vigorous condition. Such treatment has, however, quite the opposite effect—it hastens the death of the tree. It is far better to uproot and consign such a tree to the fire, and to replace it by a healthy one.

On the other hand, there are those who imagine that the more you feed a healthy tree with manures the more productive it will be. Here, again, a serious mistake is made. Excessive manuring encourages a tree to make excessive growth and to develop few fruit buds, because the nature of the food supplied is not conducive to the

storing up in the tissues of the right materials. Others, moreover, begin to apply manures to a tree before it has become established, and has had time to form an abundance of fibrous roots to collect and assimilate them, and the result is failure to make the progress expected.

When Manures are Required.—Manures can only be of real assistance to a fruit tree when it has been planted at least a year, and is furnished with a plenitude of fibrous roots; when it is in good health; and particularly so when it is bearing freely. It is, indeed, in the latter stage that the tree needs additional food to enable it to perfect and mature its crop. A tree which grows too freely, and produces too little fruit, requires to be manured differently to one which shows a tendency to crop too freely, but does not grow vigorously in proportion. Thus, we see that to grow fruit trees successfully we must not apply manures haphazardly, but with caution and judgment.

Main Elements of Plant Food.—Three main elements of plant food are required to produce successful growth and the development of fruit. These are phosphates, potash, and nitrogen. Other minor elements are usually present in sufficient quantities in the soil. Phosphates assist particularly in the development of flowers and the seeds; potash in the formation of fruits; and nitrogen in leaf, cell, and tissue formation; but all three, nevertheless, combine in the formation of the tree as a whole. As trees grow and perfect their fruits, they take annually out of the soil a good deal of phosphates, potash, and nitrogen; indeed, according to an American experiment, it has been found that ten bushels of apples removed from the soil in one season $1\frac{1}{2}$ lb. of nitrogen = 10 lb. nitrate of soda; $1\frac{3}{4}$ lb. potash = 15 lb. of kainit; and $\frac{1}{2}$ lb. of phosphate of lime = 2 lb. of superphosphate of lime. Potash especially is therefore in great demand by fruitful trees.

Natural Manures.—Stable or farmyard manures serve the two-fold purpose of supplying the soil with humus for

the encouragement of bacteria and maintaining it in a friable condition; also providing a proportion of the three main elements of food. It is not desirable that they should be mixed too freely with the soil before planting, but they can be used as a mulch to established trees in autumn. The surface soil to a depth of 3in., and a circumference equal to the spread of the branches, should be removed in autumn, 3in. of well-rotted manure added, and this be covered with soil. This dressing should be applied only to trees in good health and bearing freely. Poultry and pigeon dung may be applied in a similar way at the rate of 1lb. per square yard. Liquid manures from dung heaps or stables also contain the three elements, and may advantageously be applied in a diluted state to trees in winter or summer that are in a fruitful condition. So, too, may cesspool contents. Night-soil is also a rich manure. It should be mixed with equal parts of soil, and have a little sulphate of lime added as a deodoriser; then be stored in a heap till winter, and afterwards applied as advised for stable manure.

Artificial Manures.—Those that supply nitrogen, and are best applied in summer, when the trees can take immediate advantage of it, are nitrate of ammonia, nitrate of soda, nitrate of lime, nitrate of potash, sulphate of ammonia, soot, nitrolim, and dried blood. Those that supply phosphates and nitrogen are guanos, fish guano, bones, and dissolved bones; phosphates only—bone-ash, bone-black, mineral phosphates, superphosphate of lime, bone-meal, and basic slag. Those, again, which supply potash are sulphate, muriate, and carbonate of potash, kainit, and wood-ashes.

How to Use Nitrogenous Manures.—Nitrate of ammonia is a suitable manure to apply in a liquid form to trees with pale foliage. Use at the rate of $\frac{1}{4}$ oz. per gallon of water about twice a week in summer.

Nitrate of soda use at the rate of 1oz. per square yard to trees that have set their fruit, and afterwards at inter-

vals of a week until the fruit begins to colour. Suitable for dry soils.

Nitrate of lime is, no doubt, one of the best of fertilisers for fruit trees, especially Cherries, Peaches, Nectarines, and Plums. Apply at the rate of 1oz. per square yard once a fortnight from the time the fruit sets until it begins to colour.

Nitrate of potash is rather an expensive fertiliser, but it may be used on a limited scale with good effect. Should be used occasionally only, at the rate of 1oz. to three gallons of water. Contains potash as well as nitrogen.

Sulphate of ammonia is best adapted for heavy or damp soils, and should be used as advised for nitrate of soda.

Soot, also, is a nitrogenous manure, and may be beneficially applied to all fruit crops at all times of the year at the rate of a gallon per tree.

Nitrolim, a combination of nitrogen and calcium carbide, is an excellent fertiliser for occasional application to fruit crops generally. Apply at the rate of 1oz. per square yard in summer.

Blood, although a rich plant food, is too obnoxious to use in a fresh state. It should be mixed with soil, and placed in a heap to decompose; then be applied as a top-dressing to trees that are in good health yet not making much growth.

Dried blood should be applied in spring at the rate of 2oz. per square yard, and forked into the soil. Should not be applied to trees that are making excessive leaf-growth and not bearing freely.

How to Use Phosphatic Manures.—Guanos, owing to their containing nitrogen as well as phosphates, are best applied in spring and summer, when the fruit has set, and afterwards at intervals until the fruit begins to colour. Use at the rate of 1oz. per square yard.

Dried fish guano should be used at the rate of 2oz. per yard at intervals of a fortnight during the fruiting period.

Bone-meal is a slow-acting fertiliser, and should be applied in autumn at the rate of 4oz. per square yard, forking it in. Dissolved bones use similarly, especially on chalky soils.

Bone-ash and bone-black use at the same rate in autumn. Not very generally used.

Superphosphate of lime is made in two grades, the double and the ordinary. The former is especially beneficial to fruit trees grown on chalky soils, as it imparts more vigour to the tree, also more colour to the foliage. Of the former apply $\frac{1}{2}$ lb. to each tree in June, and again in August. Of the ordinary, apply 3oz. per square yard in autumn and fork in.

Basic slag is an excellent phosphatic manure for clayey or rich garden soils. Apply at the rate of 4oz. to 6oz. per square yard in winter, and fork in.

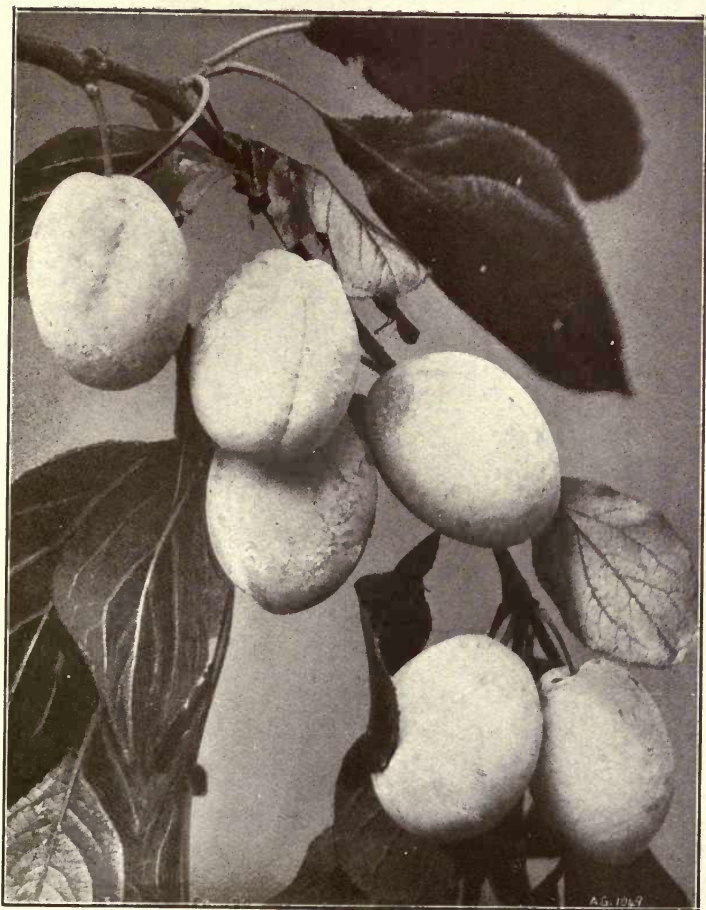
How to Use Potash Manures.—As a rule, clay soils contain sufficient potash, but it is always wise to ignore this fact in the case of fruit trees growing on such land.

Sulphate of potash is a very soluble form of potash, and easily assimilated by crops. Apply in autumn or spring at the rate of 2oz. per square yard. The same remarks apply to muriate of potash.

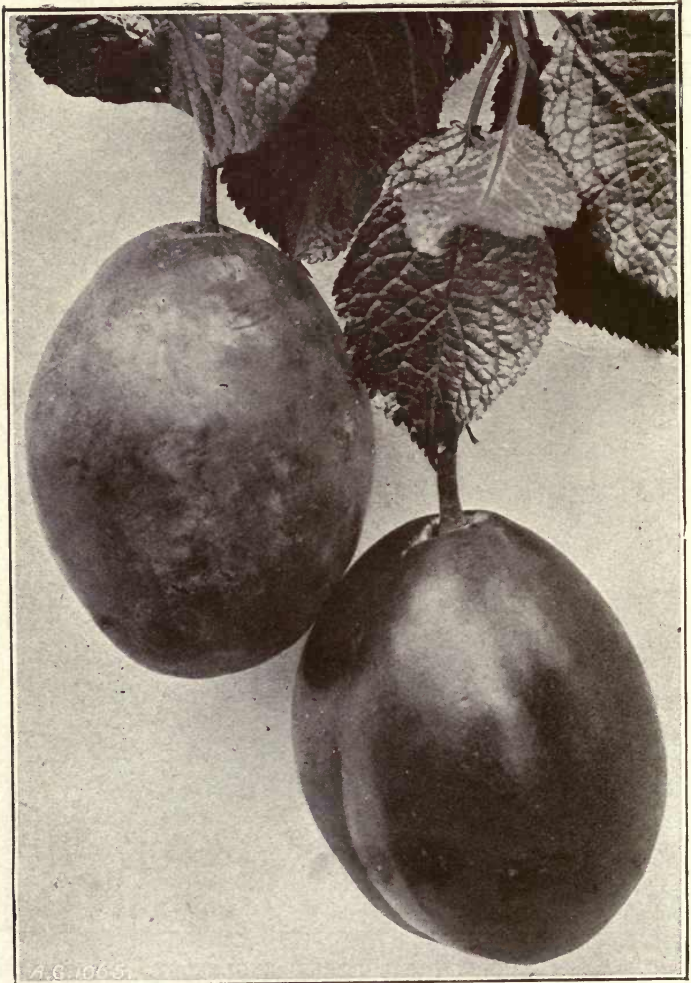
Kainit is the cheapest form of potash, and should be applied in winter at the rate of 4oz. per square yard. Fork it in.

Wood-ashes contain a good deal of potash, and these may be applied at all times to fruit crops as liberally as possible.

Lime.—This is an important factor in fruit culture. In the case of heavy clays it liberates the latent potash, and assists in breaking up the plasticity of the soil. In old or sour soils it neutralises the vegetable acids, and encourages the development of the nitrifying bacteria. It is, moreover, of immense advantage to all stone fruits, and without its presence in the soil the trees will neither grow nor fruit satisfactorily. The best form of lime to



CULINARY PLUM, PRINCE ENGLEBERT.
Season : End of August.



CULINARY PLUM, POND'S SEEDLING.
Season: Early September.

apply is ground lime, and this should be forked in every third winter at the rate of 4oz. per square yard.

Marl contains a good deal of lime, and a top-dressing of it, where it can be obtained, will prove beneficial to fruit trees generally.

General Hints.—The mistake is too often made of applying fertilisers and manures around the base of the trunk only. Manure so applied rarely benefits the tree, unless it be a cordon, with compact root action. The fine fibrous roots, which alone collect and assimilate the food, are usually situate at a distance from the trunk equal to the circumference of the branches or beyond. An old standard tree, indeed, may have its feeding roots some 15ft. or 20ft.—we have found them 30ft.—away, in fact; so that, if the tree is to derive any advantage from additional food, it must be applied where the feeding roots really are. So, in applying manures or fertilisers, the application should commence some 6ft. or 8ft. from the trunk, and extend to 10ft. at least from the outer fringe of the branches of a standard tree. In the case of a bush or a pyramid, commence at 1ft. to 3ft., according to the size and age, and apply the manure to a distance beyond, equal to the height of the tree. For cordons apply from the base to 3ft. or 4ft. beyond; and for large wall trees generally from 3ft. to 8, 10, or 12ft., according to size and age. Grape vines have a habit of extending their roots many, many yards, often under paths into the garden beyond, and it is extremely difficult to decide where their fibrous feeding roots really are. Raspberries, Gooseberries, Currants, and Strawberries are compact-rooting, and hence there is no difficulty in feeding such crops.

Special Manures for Various Fruits.—Mr. W. Dyke, in his excellent little manual on “Manures for Farm and Garden Crops,” recommends the following formulæ:

Apples and Pears.—For trees the second year after planting that do not grow freely, fork in a barrow-load of decayed manure to every six trees in autumn, and in

May apply 10z. of sulphate of ammonia and 10z. of sulphate of potash to each. Trees that grow too strongly, and do not show signs of fruiting, give 40z. of basic slag per tree each autumn. Established trees growing in sandy soil, give equal parts of bone-meal and kainit; in chalky soil, equal parts of kainit and superphosphate; in clayey soil, four parts of basic slag and one part of muriate of potash; peaty soil, four parts of basic slag and 10z. of sulphate of potash, applying in each case 40z. per square yard. He also recommends in poor, hungry soils, the addition of one barrow-load of decayed manure to every ten square yards. Each May, too, when fruit has set, he further recommends 20z. per square yard of the following mixture: One part muriate of potash, $1\frac{1}{2}$ parts of sulphate of ammonia, and 3 parts of superphosphate.

Apricots, Cherries, Plums, and Damsons.—Where soils are deficient in lime, apply 1lb. of ground lime per square yard on heavy soils, or 4lb. of powdered limestone or chalk on sandy soils. To be applied every third year in autumn. Each winter apply 1lb. of basic slag and 40z. of sulphate of potash per tree on heavy soil; or 12oz. of superphosphate and 8oz. of kainit per tree on chalky soils. Trees that promise to yield a heavy crop should also be given, in June, $\frac{1}{4}$ lb. to $3\frac{1}{2}$ lb. of fish-meal per tree, according to size.

Currants and Gooseberries.—These should have a winter dressing of three barrow-loads of decayed manure per square rod, and 40z. of basic slag and 20z. of kainit per tree. In May apply 10z. of nitrate of soda or of sulphate of ammonia per tree.

Figs.—Apply 40z. of bone-ash or 8oz. of basic slag per square yard in winter. To trees carrying heavy crops apply once a week, in summer, 20z. of guano or of fish-meal, or liquid stable manure.

Peaches and Nectarines.—Before planting, Mr. Dyke advises 4lb. of bone-meal, 2lb. of hoof and horn, $\frac{1}{4}$ lb. of

sulphate of potash, and 4lb. of chalk to be mixed with every cubic yard of soil. When the trees are in full bearing apply just before, and again after stoning, the following mixture: One part Peruvian guano, two parts dissolved bones, and half a part muriate of potash, applied at the rate of 2oz. per square yard. If the trees fruit too freely, and do not make a robust growth, apply the following mixture in place of above—viz., one part nitrate of lime, two parts guano, one part dissolved bones, and one part muriate of potash; or, on the other hand, making too much growth, and not bearing freely, one part nitrate of lime and four parts of bone-ash. In each case apply 2oz. per square yard.

Raspberries.—Apply three barrow-loads of rotten manure, 4lb. of basic slag, and 1lb. of sulphate of potash per square rod in winter. When the plants are in flower apply 3lb. of fish or Peruvian guano per square rod.

Strawberries.—In April apply 2lb. of superphosphate per square rod, and, directly fruit has set, a similar quantity of nitrate of soda or sulphate of ammonia.

In addition to Mr. Dyke's formulæ, we give particulars of special manures suitable for other kinds of fruit:

Blackberries and Loganberries.—For these, one part of superphosphate, one part of kainit, applied at the rate of 2oz. per square yard in autumn; and 1oz. of nitrate of soda per square yard, applied when the fruit has formed, are suitable fertilisers.

Mulberries.—Equal parts of bone-meal and kainit, applied at the rate of 6oz. per square yard in autumn, and 2oz. of nitrate of soda to the same area when the berries have formed.

Nuts.—Apply 4oz. per square yard of equal parts of superphosphate and kainit per square yard in autumn.

Further on in this volume we give in tabular form the formulæ for manuring fruit trees grown in orchards and market gardens.

CHAPTER VI.

Storage of Fruit.

THE gathering and storing of fruit so that it can be made the most of, and kept in the best possible condition for winter use, are of great importance. With regard to Apples and Pears, it is a common error to gather late sorts too soon, while early sorts are not gathered soon enough. Most of the early dessert Apples and Pears lose their brisk flavour as soon as they become fully ripe, and soon after they commence to go sleepy, and then rotten. Unless late varieties are allowed to hang until they have become fully matured they never get their proper flavour, and they often shrivel in keeping.

How to Ascertain when Fit to Gather.—All the fruit on one tree is never ready for gathering on the same day; two, and sometimes three, pickings are necessary to get them in the best condition. This is more especially the case with the earlier varieties than it is with the late ones. The practised eye can see at once which are likely to be ready; and if these come off easily with a gentle pull, lifting the fruit upwards at the same time, they are ready; but if not, they are left for a few more days. Apples are very often attacked by the grubs of the Codlin Moth, which causes them to fall; or rough winds may blow many down; neither of these causes should be taken as a sign that they are ready for gathering. These may all be used, or sold, without loss, which is far better than storing them with sound fruit. A few fruit of the best is better than a large quantity of inferior quality.

The Fruit Store.—A good position to store apples in is a moist, cool place, such as a cellar, with a temperature of

40 deg. This should be well ventilated for two or three weeks after the fruit has been stored, until the perspiration has dried up; then gradually close and make quite dark. Pears require a warmer and drier atmosphere to bring up and retain their flavour. For these an attic would answer, if a fire could be lighted in severe weather. We saw a very good fruit room a short time ago in a clergyman's garden. A hole was dug in the ground 9ft. wide, about 12ft. long and 3ft. deep. The soil, being of a clayey nature, was used as mud walls for continuing the building about 2ft. higher at the sides, and the ends in proportion. There was enough soil to bank the sides up to the roof about 3ft. in thickness. The roof was thatch, about 1ft. in thickness. Nothing could be better for keeping the cold and the heat out, or for preserving the fruit, and the expense in building was trifling. The door was the weak point, but this could be remedied by having two doors. Anyone could have shelves in this place 3ft. wide and 1ft. 6in. apart each side, or one side could be shelved and the other used for different purposes.

Another method is to procure some of the movable fruit trays which are usually advertised for sale in the gardening journals in autumn. These are made with open lath bottoms, and with sides sufficiently deep to allow of a single layer of fruit being placed on them. The trays, as filled, are then placed one over the other to form a kind of nest, and may be stored in a cellar, or cool place, or on the floor of the fruit room. These trays occupy comparatively little space, and the open laths permit a free circulation of air among the fruit. Some have a frame made to take the trays, and enable the latter to be easily withdrawn when required. Anyway, this is an excellent plan for those who have only small quantities of fruit to store, and only limited storage room. (Fig. 122.)

Where a large quantity of fruit has to be stored, a proper fruit room should be provided. The best position for this is against a north wall.

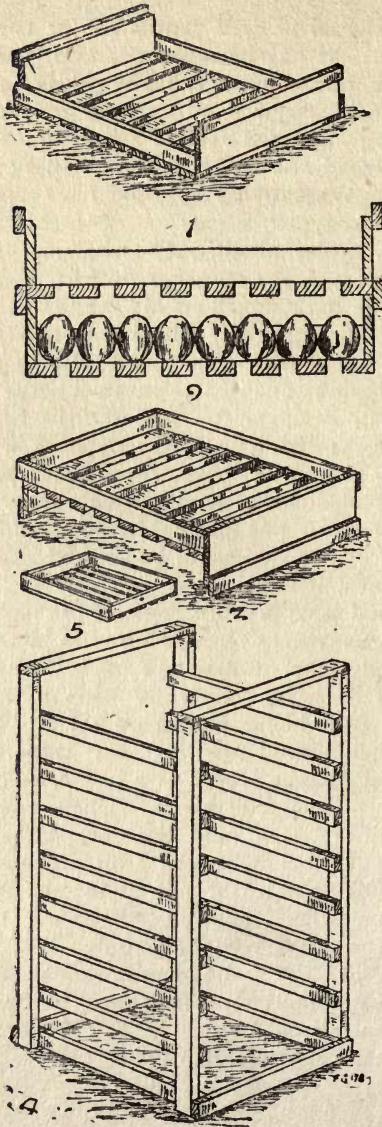


Fig. 122. A HANDY FRUIT STORE.
 (1) Tray for storing fruit. (2) Section showing two trays in position. (3) Another form of tray.
 (4) Frame for holding trays in position when filled. (5) Tray for gathering fruit.

The drawings given herewith illustrate a lean-to building designed as far as practicable to meet all ordinary requirements. A thatched lean-to roof for a roft. span should rise

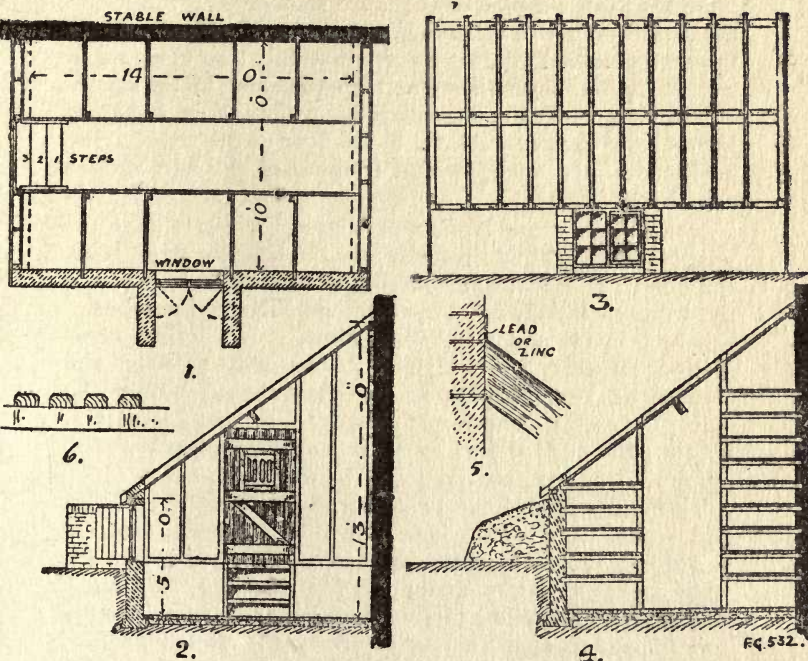


Fig. 123. A LEAN-TO FRUIT ROOM.

(1) Ground plan. (2) Section of elevation. (3) Side elevation. (4) Section of interior. (5) Details of apex of roof.

at least 8ft. from the lowest to the highest point, or wet will not run off freely. The height of the building shown is 5ft. at the front from the floor to the wall plate level,

and 13ft. at the back. The portion of the store that is sunk 2ft. below the ground level should be built of blue bricks in cement mortar, as also should the front wall against which earth is to be banked to prevent damp striking through. About 1,700 blue bricks will be required.

Fig 123 (1) is a plan of the store showing the window in the front wall with a retaining wall on each side to hold up the earth banked against the front wall. The uprights in the wooden ends are shown, with the door in the centre of the east end to open outwards, whilst three steps are shown from the ground level to the floor of the store. The positions of the uprights and framing of the lath shelves are also indicated.

No. 2 is a cross section of the store, and shows the window, with hinged shutters, also the framing in one end, the door, the steps, and the roof construction. No. 3 is the front elevation, and shows the position and number of the roof spars, and also the window. No. 4 is a cross section showing how the lath shelves may be fixed and arranged. The uprights in the ends should be 4in. by $2\frac{1}{2}$ in., the rafter at each end 4in. by $3\frac{1}{2}$ in., the spars $3\frac{1}{2}$ in. by 2in., the purline 7in. by $2\frac{1}{2}$ in., and the wall-plate $4\frac{1}{2}$ in. by 3in.

The steps may either be constructed of wood or brick and stone. The door should be of $\frac{3}{4}$ in. thick boarding nailed to $1\frac{1}{4}$ in. thick ledges and brace. The window is 3ft. wide and $2\frac{1}{2}$ ft. high, one-half being made to slide open. The shutters should be of $\frac{3}{4}$ in. thick matchboarding, ledged and hinged to open, as indicated by the dotted lines in No. 1.

Creosoted weather-boarding will be the best for the outside of the ends of the store, and $\frac{1}{2}$ in. thick grooved and tongued matchboarding for the inside, whilst the ceiling will be all the better if it is covered on the underside with similar boarding. The space between the two thicknesses of boarding at the ends should be filled with slag wool or other suitable non-conducting material. Cement concrete 2in. thick will make a satisfactory floor.

Another good style of fruit room is illustrated in accompanying diagram (Fig. 124). The outer shell consists of a nine-inch wall 8ft. or so high. This should be covered with a thick roof of thatch or heather. Outside this structure should be erected a duplicate shell of wood, thatched with straw, leaving an air space of 6in. to 1ft. between the brick wall and the wood. This lining of air serves to maintain an even temperature and to keep out frost. The door should be made as shown at Fig. 125, its upper half being fitted with

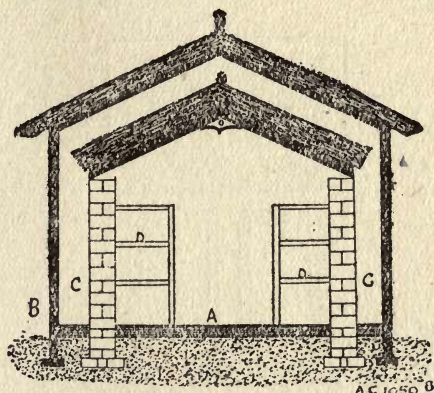


Fig. 124. A SPAN-ROOF FRUIT ROOM.

A represents the inner chamber; and *B* the outer shell; *C* is the air space between the two; *D* is the slate shelving on which the fruit is stored.

wire netting to admit air in fine weather. In frosty weather a shutter must be attached. The width may be 8 to 12ft., and the length as you please. Inside shelves should be constructed 3 to 4ft. wide, and 2ft. apart. The shelves should be formed of open laths, and the fruit arranged in a single layer thereon. The floor space underneath may be used for storing bulbs, potatoes, etc. Instead of fixed shelves, portable wooden fruit trays, already described, may be purchased, and these stored one over the other.

General Hints.—The average temperature of a fruit store should be 40 to 45 deg. Never allow it to fall lower than 40 deg.; otherwise Pears will lose their flavour. Store the fruit in single layers, and, as far as possible, keep the early, mid-season, and late kinds by themselves. Never store fruit on straw or hay, as these substances impair the flavour of the fruit. Examine the fruit daily, and remove all decayed ones. The presence of one decayed fruit in a store often sets up decay in others, besides affecting their flavour. The ripening

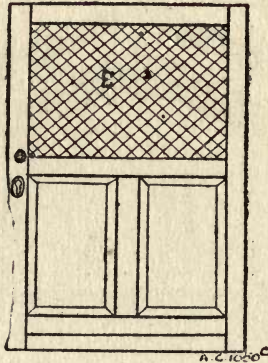


Fig. 125. DOOR FOR SPAN-ROOF FRUIT ROOM.

The upper half is fitted with a wire frame and shutter for the purpose of admitting air occasionally in fine weather.

period of Pears may be hastened by placing a few in bran in tin boxes, and storing them in a warm cupboard or room for a few days.

Other methods of storing fruit are placing them in unglazed earthenware jars with a movable lid, and storing them in a cool room or cellar; packing them in tissue paper and storing in dry sand; and placing them in clean, sweet barrels in a dark, cool place. The worst of all places in which to store Apples is a dry loft or room. All

choice fruits when gathered should be carefully wiped clean with a dry cloth before they are stored away.

The baskets for gathering the fruit should be padded to prevent the fruit getting bruised. The fruit should not be dropped, but placed in the basket, and also be taken out with the hands when emptying the baskets. Fruit should always be dry when gathered, and never be moved after once being put on the shelves.

Detailed instructions about the methods of storing nuts and fruits generally are given in the chapters dealing with their culture.

CHAPTER VII.

FRUIT ENEMIES.

Apple Pests.

Apple Aphis (*Aphis pomi*).—Larvæ attack the young leaves in early spring and cause them to curl. First brood is hatched in April from eggs laid on the shoots in autumn. *Aphis sorbi* and *fitchii* also infest the Apple, the former the leaves and the latter the shoots. Spraying in autumn with a paraffin emulsion, and again in February with a lime-sulphur wash, are good preventive remedies. In case of attack, spraying is of little use owing to the curling of the leaves. Better then pick off and burn the curled leaves. Burn all winter prunings.

American Blight (*Schizoneura lanigera*).—A species of aphis, which infests the shoots and branches, sucks out the sap, and causes excrescences to form, which eventually bring the tree into ill-health. The female aphis produces her young alive, and these secrete a white woolly substance, which is the characteristic feature of this pest. At first the young lice are yellowish, but later they assume a purplish-brown tint. In autumn and winter the females hide in crevices in the bark, and also on the roots near the base of the trunk. They increase rapidly in spring and summer. Winged females fly from tree to tree, and in this way the pest distributes itself. Spray in winter with a lime-sulphur wash to kill the winter broods, and in summer with a soft soap and quassia emulsion to destroy the lice. Where only a few aphides exist, lightly dab the colony of lice with a brush dipped in soap and paraffin or in olive oil. See also p. 345.

Apple Blossom Weevil (*Anthonomus pomorum*).—The larvæ of this weevil, which are small, white, and foot-

less, and with a brown head, feed on the stamens of the opening blossom bud, and thus prevent its developing into fruit. The female beetle deposits one egg in the centre of the unopened bud. The presence of the larvæ may be detected by the brown and shrivelled appearance of the petals. Spraying does not appear to be effectual, as, of course, the liquid cannot get at the young larvæ in the bud. Mr. F. Theobald suggests jarring the trees frequently to dislodge the weevils. Tared cloths should be spread under the branches to catch the falling beetles.

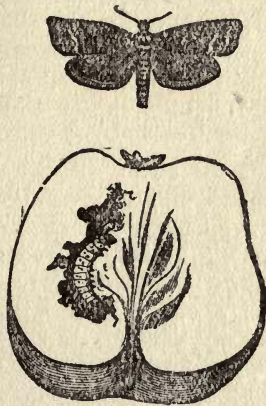


Fig. 126. CODLING MOTH AND GRUB (*CARPOCAPSA POMENELLA*).

Note, the grub is seen inside the fruit.

Apple Sawfly (*Hoplocampo testudinea*).—The female flies deposit their eggs in the open blossom. The eggs give birth to creamy-white larvæ, with several sucker-like feet and a brown head. They eat their way into the centre of the fruit, and remain there till fully grown, then escape through a hole near the eye and enter the soil, in which they remain till spring, then pupate and appear as flies later on. The only remedy is to gather and burn all fruits that show signs of attack, and to dress the soil in winter with a soil fumigant.

Codling Moth (*Carpocapsa pomonella*).—The caterpillar of this moth attacks the interior flesh of the Apple, and causes it to fall prematurely. The female lays one egg on the side of the newly-formed fruit, generally at night. As soon as the young caterpillar is born it crawls to the eye of the fruit, and gradually eats its way into the centre thereof. When it is fully grown the larva either lets itself down by means of a silken web to the ground, or escapes from the fallen fruit, and then ascends the trunk, forms a cocoon in crevices of the bark, and remains in this till spring; then pupates, and appears in June as a moth. The larvæ are creamy-white in colour. Grease-banding early in June will trap the ascending larvæ, and spraying the trees in about ten days after, the petals have fallen with arsenate of lead will destroy the ova and young larvæ. (Fig. 126.)

Apple Sucker (*Psylla Mali*).—A small insect, about 1-10th to 1-3rd-inch in length, greenish-yellow to brownish-yellow in colour, which attacks the leaves, buds, and blossoms of the Apple. In the former case leaves infested with this pest become crinkled, shrivelled, and brown; and in the latter one, the blossoms shrivel and turn brown. Both sexes are winged, and they usually appear between April and November. The female deposits her eggs on the spurs and growth buds in autumn, and these hatch out in late April or early May. The insects are very agile in their habits, hopping off directly the leaves are touched. Spraying with a wash composed of lime and sulphur between February and the end of March appears to be the best means of destroying the ova of this pest, and thus preventing its later appearance.

Winter Moth (*Cheimatobia brumata*).—Several caterpillars, the larvæ of moths, attack the foliage of the Apple, and do much injury to the trees if very numerous. The chief culprit is the larva of the Winter Moth (*Cheimatobia brumata*). The female moth, which is wingless and greyish in colour, is capable of laying as many as 350 eggs. The

moths appear between early October and early January, and lay their eggs on the buds and the small shoots. The eggs hatch early in spring, and the young larvæ commence to feed on the unfolding leaves; later they spin the leaves and flowers together, and feed on these, and still later attack the young fruits. The caterpillars form their bodies into a loop when moving, are of a greenish colour with pale lines on their bodies, and usually measure about an inch in length. They arrive at maturity in June, then descend to the earth, enter the pupal stage, and appear as moths between September and January. Grease-banding the trunks about 1ft. from their base early in October, and maintaining the grease in a fresh condition up to mid-January, will trap the wingless females which attempt to crawl up the trunk to lay their eggs. Should caterpillars appear, directly their presence is observed, spray the trees with an arsenate of lead solution when the leaves begin to unfold, and again about ten days after the trees have shed their blossoms. The larvæ of the Mottled Umber Moth (*Hybernia defoliaria*), creamy-yellow and chestnut-brown in colour, appear about the same time, and do similar damage to those of the Winter Moth. The March Moth (*Anisopteryx æscularia*) has green or greenish-yellow larvæ, about an inch in length when full grown, which appear in April, and defoliate the trees. The remedies in both cases are those advised for the Winter Moth; but in that of the March Moth the grease-bands must be kept on the trees till April. The females are wingless.

Lackey Moth (*Clissiocampa neustria*).—This moth, both sexes of which are winged, appears between July and September, and the female lays her eggs in bands around shoots of the current year's growth. These bands may be readily detected. Late in April the larvæ appear, spin a web over a cluster of leaves, and in the earlier stages of their existence feed under the protection of this. Later, however, they roam about the foliage, returning to their

webby habitations at nightfall and during wet weather. The larvæ are bluish-grey, striped orange and white, and spotted black. They measure about $1\frac{1}{2}$ in. when fully grown. In June and July the larvæ spin silken cocoons either among the leaves or in crevices of the bark, and reappear as moths in the course of a few weeks. Spraying in May or June with arsenate of lead will kill the larvæ. The webs, too, should as far as possible be cut off, and the bands of eggs removed as soon as seen. Burn all prunings. (Fig. 127.)

Ermine Moth (*Hyponomeuta malinella*). — In some seasons the larvæ of this moth prove very destructive to

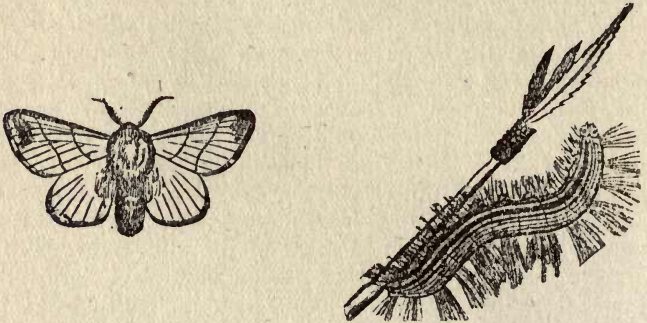
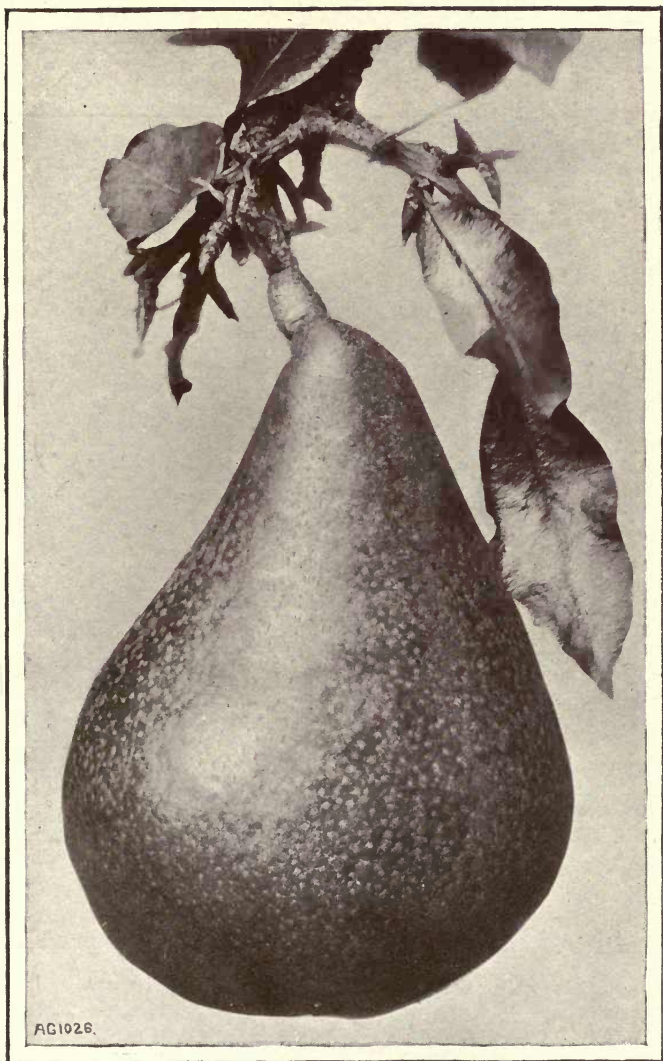
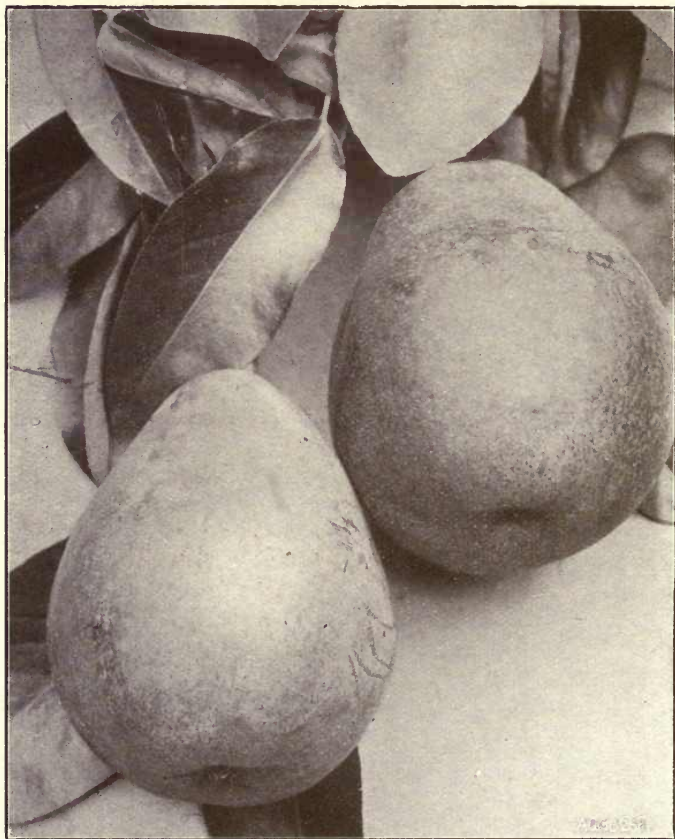


Fig. 127. LACKEY MOTH and LARVA (*BOMBYX NEUSTRA*).

the foliage of the Apple. The moths appear in July and August, and the females deposit their eggs in small patches on the twiggy growths. The eggs are covered with a glutinous matter, which hardens and forms a sort of case over them. The eggs hatch out in early autumn, and the tiny larvæ remain under the protective covering until the buds begin to develop; then they commence to feed on the young leaves and the flowers. Later they spin a web, and under this devour the whole of the soft parts of the leaves. At first the larvæ are of a yellowish tint, but when more advanced the colour is an ash-grey, spotted black. Late in June they form cocoons



DESSERT PEAR, BEURRÉ CLAIRGEAU,
Season : November.



DESSERT PEAR, BEURRÉ ALEXANDRE LUCAS
Season: November.

in the webs, pupate, and appear a month or so later as moths. Where possible the tents or webs and the larvæ should be collected and burnt. Spraying in winter with a caustic alkali wash might kill the eggs, and with arsenate of lead in May or early June would destroy the larvæ.

Fruit Tree Beetle (*Scolytus rugulosus*).—A small beetle measuring about 1-10in. long, and of a blackish hue, which does serious damage to Apple trees by making tunnels in

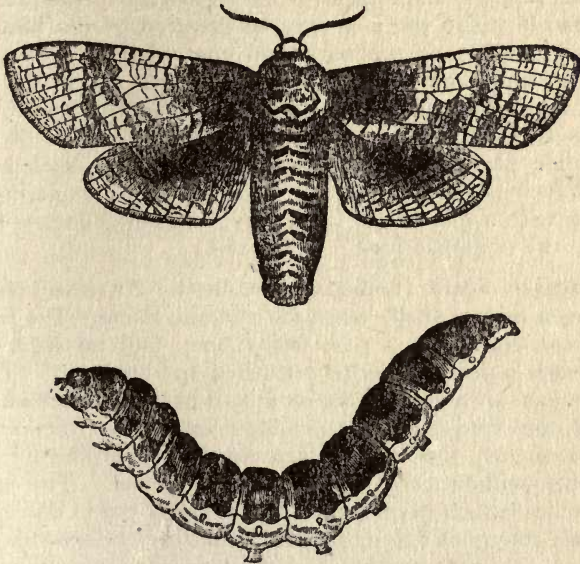


Fig. 128. GOAT MOTH (*COSSUS LIGNIPERDA*) AND LARVA.
Both of natural size.

the bark. In these tunnels the females deposit their eggs, which hatch out into small footless white maggots or grubs. These, in turn, make fresh tunnels, and so honey-comb the bark that the tree gradually dies. Since the beetles and larvæ cannot be reached by insecticides, the only remedy is to cut down and burn infested trees. March is the best time to do it.

Goat Moth (*Cossus ligniperda*).—The female moth deposits her eggs in crevices of the bark in June and July. These soon give birth to caterpillars, which eat their way into the bark, and gradually tunnel into the heart of the trunk. They are pinkish when young, and a rich yellow marked with a mahogany stripe when older. The larvæ live for three years in the tree. Sometimes they are to be met with crawling about, but, as a rule, they pupate in the tunnels, and appear as moths in June. The presence of the larvæ in the tree may be detected by the lumps of frass hanging to the bark and concealing the entrance. If, as sometimes happens, several larvæ are in one tree the latter may die. To destroy the caterpillars in their tunnels, thrust in a piece of red-hot wire. Bits of stick cyanide placed in the holes, and the latter sealed over tightly with clay, is another good remedy. Smearing the bark with a mixture of lime, clay, and cow dung will prevent the eggs hatching. (Fig. 128.)

Mussel Scale (*Lepidosaphes ulmi*).—An insect resembling a mussel shell, hence its common name. The female insect, which has a pale fleshy body and no legs, lives beneath a scaly covering attached to the bark. There, by means of a sucker-like mouth, it penetrates the bark or rind, and feeds on the sap. Male insects are very scarce, consequently the females are capable of producing their young without the agency of the former. The female attaches herself permanently to the bark, and in due course lays a colony of eggs under the scale, and afterwards dies. When the eggs are hatched the larvæ for a time wander about the shoots, fruit, and leaves. The larvæ are also transported about the trees by birds, insects, etc. When they are present in large numbers the scales seriously injure the tree by puncturing the bark and removing the sap. Spraying in June with a paraffin emulsion, and in winter with the lime-sulphur wash, are the best remedies.

Wood Leopard Moth (*Zeuzera pyrina*).—Like the larvæ

of the Goat Moth, the caterpillar of this moth also forms tunnels in the bark and heart wood of Apple and other trees, and often kills them. The moth appears in summer, and lays its eggs in deep crevices of the bark. In a short time larvæ are hatched from these, of a yellowish-white colour, with black bristles and a brown head. When fully grown they measure 2 in. in length. They exist in the larval stage for about a year, then pupate in a silken cocoon beneath the bark, and appear as moths in summer. Apply the remedies advised for the Goat Moth, or inject some disulphide of carbon into the hole, and plug it up tightly. If a branch is found to be shrivelling, cut it off and slit it in two, when probably the larva will be found therein.

Miscellaneous Pests.—In addition to the foregoing there are numerous other pests that are harmful to Apple trees, though only in a minor degree. Thus the Apple Tree Mite (*Oribata lapidaria*) infests the fruit buds, and sucks out the sap; the caterpillar of the Bud Moth (*Hedya ocellana*) spins the young foliage and blossoms together, and causes them to shrivel and turn brown; the Green-leaf Weevil (*Phyllobius maculicornis*) devours the soft portions of the leaves; the Shot Borer (*Xyleborous dispar*) bores into the bark and pith; and the larvæ of Pith Moths (*Blastodacum kellerella* and *vinolentella*) bore into the buds, shoots, and spurs and kill them. When shoots are seen to shrivel, cut them off and burn them. The larvæ of many moths also levy toll on the foliage, the remedy for which is spraying in early summer.

Apricot Pests.

Apricot Moth (*Batodes angustiorana*).—The small greyish or yellowish-green larvæ of this moth curl the leaves into tubes and feed upon them. The female moth lays its eggs on the shoots in summer; these hatch out in early spring—from April onwards—and often do much injury to the foliage. When disturbed they drop out of

the folded leaves by means of a silken thread. If undisturbed they will, when full grown, pupate in the folded leaf tube. Crushing the larvæ in the leafy tubes, or spraying with arsenate of lead when the fruit is set, are the best means of coping with this pest.

Other Pests.—The Bark Beetle (*Scolytus rugulosus*), Winter Moth (*Cheimatobia brumata*), Mottled Umber Moth (*Hybernia defoliaria*), Bud Moth (*Hedya ocellana*), Peach Aphis (*Aphis amygdali*), and Peach Scale (*Lecanium persicæ*) infest the Apricot. These pests are dealt with in other sections of this chapter.

Cherry Pests.

Cherry Aphis (*Myzus cerasi*).—A species of black fly which infests the shoots and leaves of the Cherry in summer, coating the surface of the latter with a gummy secretion from its body, and causing them to curl up. Like other aphides, the Cherry Aphis also sucks the sap out of the foliage. Viviparous females are produced in early spring from eggs laid on the shoots the previous autumn. Successive generations are produced during the season, and unless prompt steps are taken to destroy the earlier brood the lice will seriously cripple the growth of the trees. Spray with a soft soap and quassia wash as soon as the aphis is seen. Repeat the dose if the first one fails to get rid of the pest. It is also advisable to spray with a paraffin emulsion in autumn to destroy the egg-laying females.

Cherry Tree Borer (*Semasia woerberiana*).—The larvæ of this moth bore into the bark of Cherry and Plum trees, and feed on the inner bark, causing gum to exude and also the parts affected to swell. In due course the tree falls into ill-health and dies. The moths appear in June, and lay their eggs in the crevices of the bark. The larvæ are of a pinkish hue, about $\frac{1}{2}$ in. long, and enter the pupal state in August. A second brood appears in September, and lays eggs which hatch out in April. Smearing the

trunks with a mixture of fresh cow-dung and lime in May and June, and again in September, to prevent egg-laying is the only remedy.

Cherry Slugworm (*Eriocampa limacina*).—Slugworms are the larvæ of a black, shiny sawfly. The latter appears about June, and deposits its eggs in the cuticle of the under sides of the leaves. The eggs hatch in a few days, and the larvæ, which are slug-like in form, greenish in colour, and have slimy bodies, crawl on to the upper surface of the leaves, and feed thereon, leaving the veins and under-surface only. The leaves have thus a blotched appearance, and, being unable to carry on their functions, they wither and die. Early in July the larvæ descend to the ground, form cocoons, and pupate an inch or so below the surface. In case of an attack, spray the trees with arsenate of lead. Fork in also, in autumn, one of the soil fumigants to destroy the pupæ.

Other Pests.—In addition to the foregoing special pests, the larvæ of the Winter, Mottled Umber, Lackey, and other moths feed on the Cherry. See the section devoted to Apple pests. The Bark Beetle also bores into the trunks; and various weevils feed on the foliage.

Currant Pests.

Black Currant Bud Mite (*Eriophyes ribis*).—One of the most troublesome and destructive pests that attack the Currant. Also known as the Currant Gall Mite and the Big Bud Mite. The Mite is a microscopic creature, hardly visible except through a powerful lens; has a cylindrical, semi-transparent, whitish body, and lives in the scales of the wood buds. There it sucks out the sap, and in doing so so disorganises the tissues that growth is unable to take place. The buds, consequently, instead of producing shoots, develop to an abnormal size, and finally shrivel and die. The mites enter the young buds in July and August and deposit their eggs. The following spring—April and May—the mites escape, and crawl about the

bushes in search of new buds. It is assumed that some crawl on the ground to other trees, or that they are carried by bees or other insects thereto. Anyhow, the fact remains that the infestation quickly spreads to other trees. Now as to remedies. Picking off and burning all swollen buds seems to be the most certain remedy. Where trees are badly infested this plan is hardly practicable, because

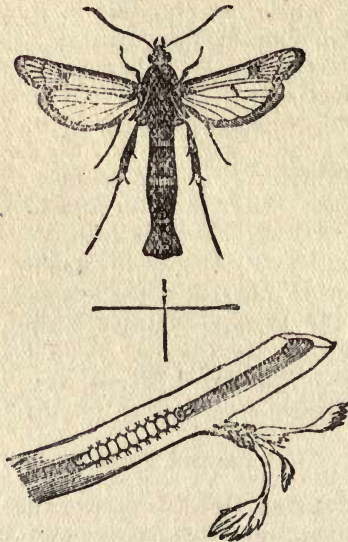


Fig. 129. CURRANT CLEAR-WING MOTH (*SESIA TIPULIFORMIS*).

The upper figure is the moth; the cross lines below indicate its natural size; at the bottom is a shoot with the larva inside.

it would mean destroying all, or nearly all, the buds, and the trees would be rendered worthless. Clearly, the best remedy would be to dig up and burn the trees, and not to plant Black Currants again on the same site. Another remedy advised is to dust the bushes in spring and summer, when the foliage is moist with dew or after rain, with a mixture of one part of fresh ground lime and two parts of flowers of sulphur. Some growers claim to have

got rid of the mite by occasionally spraying the foliage with a solution of fir-tree oil.

Currant Clearwing Moth (*Ægeria tipuliformis*).—The larvæ of this moth bore into the shoots of Currants, feed on the pith, and cause the growths to shrivel and die. The female moth lays one egg on each shoot in June. The larva, which has a creamy-white body and a brown head, appears in about ten days, and immediately bores into one of the young lateral growths, and thence into the pith of the main shoot. It remains in the shoot till April, then enters the pupal state, and appears as a moth in June. Its presence in shoots is indicated by the shrivelling of the foliage and the withering of the former. Slit the shoot open, and the culprit will be found in the pith. The only remedy is to cut off and burn any withering or dead shoots. (Fig. 129.)

Currant Shoot Borer (*Incurvaria cupitella*).—The parent of this pest is a small moth, the female of which lays her eggs in the young fruit late in May or early in June. The larvæ feed on the seeds for a short time, then quit the fruits, spin a cocoon over themselves, and hibernate in crevices of the bark till spring, when they again come forth, and at once bore into the buds and young shoots, causing them to flag. In their earlier stages the larvæ are bright red, but later they become greenish-white. Pupation takes place early in May, and the moths appear in June. Picking off the drooping shoots and burning them, also spraying the bushes in winter with a caustic wash, are the only remedies.

Currant Aphis (*Rhopalosiphon ribis*).—A species of plant lice which infests the under-surfaces of the leaves of Currants, causing them to turn brown and shrivel. Very often leaves so infested have reddish blisters on their upper sides; these, however, are declared by Professor Theobald not to be due to aphis infestation. Wingless, viviparous females produce their young alive from April

to August. Some of the lice pupate, and become winged females, which fly from bush to bush, and so spread the infestation. In autumn a brood of male and oviparous females is produced. The latter deposit their eggs on the shoots, and these in early spring give birth to viviparous females. The same aphid infests lettuce and sow thistles. Always examine the foliage early in the season, and if any lice are seen spray with quassia and soft soap solution. Once the leaves have curled it is difficult to apply a spray fluid to reach the aphides. In the case of Red and White Currants that are infested, summer prune and burn the shoots removed.

Currant Sawfly (*Nematus ribesii*).—The larvæ attack the leaves of the Red and White Currant, also the Gooseberry, and in a very short space of time completely defoliate the bushes unless they are destroyed before much mischief is done. The female sawflies deposit their eggs in the cuticle of the under side and in rows close to the ribs of the leaf. The larvæ appear in about ten days. At first they have green bodies, with black spots and black heads; and later the colour changes to a bluish-green, the head being brown and the black spots being absent. Their length when fully grown is about 2-3 in. They feed first on the epidermis, and then gnaw holes in the leaf, finally devouring all the soft parts, leaving the ribs only. When they reach maturity the larvæ enclose themselves in a cocoon, and either pupate in the soil or under any débris lying on the surface. Several broods are produced during the season, the last one remaining in the pupal stage till spring. Repeated spraying with a quassia and soft soap solution is the safest and best method. The use of arsenical preparations is too risky, unless it is done before the fruit begins to ripen. Where bushes were badly attacked the previous summer, remove the upper three inches of soil and burn it, replacing the burnt earth. Another plan is to dig in a soil fumigant in autumn to destroy the pupæ. (Fig. 130.)

Brown Currant Scale (*Lecanium persicæ* var. *sarothamni*).—This insect infests the Currant and Gooseberry; as well as several kinds of shrubs. The female scales are yellowish-brown in colour, hemispherical in shape, and about $\frac{1}{8}$ in. long. The former lays a large number of minute eggs, which give birth to oval-shaped larvæ, that, during the earlier stage of their existence, wander about the bushes until they have found suitable positions on the

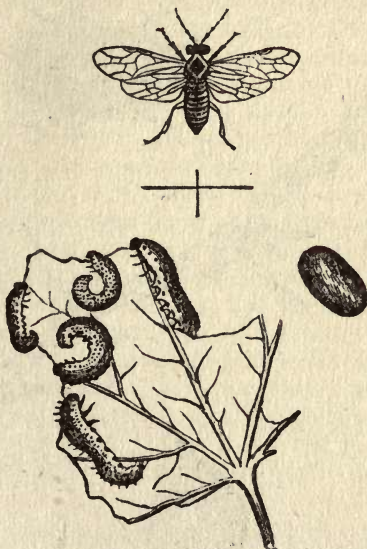


Fig. 130. GOOSEBERRY AND CURRANT SAWFLY (*NEMATIS RIBESII*).

Above is the Sawfly with lines below to indicate its size. Below are the larvæ feeding on a leaf, with a cocoon at the side.

young shoots to settle down permanently. They then pierce the bark, and by means of their beak-like mouths suck out the sap from the shoots, causing the latter to be stunted in growth and sickly. There are at least two broods of this pest in a year. Spraying the bushes in January with a caustic alkali wash is the best way of getting rid of this pest. (Fig. 131.)

White Woolly Currant Scale (*Pulvinaria vitis* var. *ribesiæ*).—A pest which is readily distinguished by the masses and threads of white wool-like substance which accompany it. The female scale is of a yellowish tint, reticulated with brown, and lays its minute eggs on the woolly mass in June. The larvæ move about freely, and

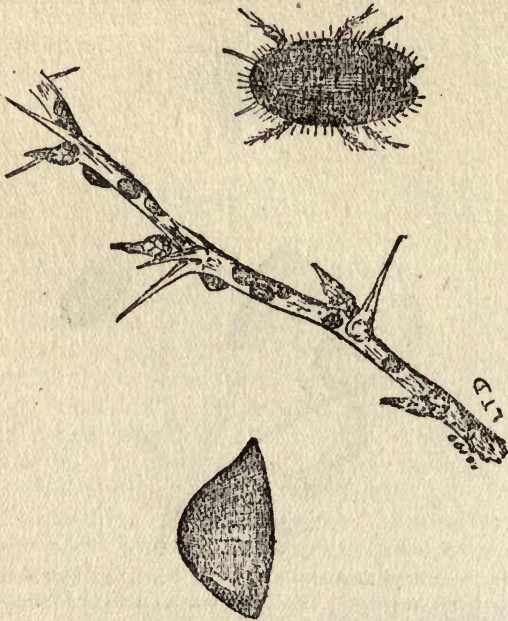


Fig. 131. BROWN CURRANT SCALE (*LECANIUM PERSICÆ SAROTHAMNI*).

Upper figure represents the female and the lower one a side view of the scaly covering which shelters the young insects.

suck out the sap from the shoots. The woolly fibres containing the eggs are readily blown to other bushes by the wind, and birds and insects carry them about. Trees

infested with this pest soon become sickly. The remedies are those advised for the Brown Currant Scale.

Other Pests.—The larvæ of the Winter and Magpie Moths also infest Currant bushes. See descriptions, etc., in other sections.

Gooseberry Pests.

Gooseberry or Magpie Moth (*Abraxus grossulariæ*).—The larvæ of this moth feed on the foliage of the Gooseberry and the Currant, and speedily defoliate the bushes unless they are destroyed in an early stage of their existence. The parent moth is a very pretty insect. It has a yellowish body and creamy-white wings, spotted with black. The female lays its cream-coloured eggs in July and August in groups on the under side of the leaves. The larvæ feed on the leaves for a short time, then they spin leaves together and pass the winter thus, either in the soil or in crevices of the bark, etc., until spring, when they come forth, ascend the bushes, and begin to feed on the young foliage. They are then of a creamy-white colour, spotted with black, and marked with yellow on their sides. Early in July they enter the pupal stage, and emerge as moths in August. Spraying in early autumn with arsenate of lead to kill the larvæ is the best remedy. If any larvæ are seen in early spring, spray the bushes with a similar preparation.

Gooseberry Red Spider (*Bryobia ribis*).—A small mite with a pale-coloured body, dotted with reddish spots, which infests the leaves in hot, dry seasons, and sucks out the sap, causing them to assume a silvery appearance. It feeds mostly on the under surface of the leaves. The mites lay their eggs on the shoots in early spring and onwards, and if the weather should be warm and dry the larvæ will soon swarm over the foliage and do serious harm. Spraying the bushes in February with a lime-sulphur wash will kill this pest; or later with a nicotine preparation if the first remedy should fail, will prove effectual.

Other Pests.—The larvæ of the Winter Moth eat the foliage; those of the Currant Clearwing Moth bore into the shoots; the Currant Sawfly larvæ devour the foliage; and the Currant Aphis and Brown Scale suck the sap out of the leaves and shoots. See other sections for descriptions.

Nut Pests.

Filbert Bud Mite (*Eriophyes avellanæ*).—A mite allied to the Big Bud Mite of the Black Currant. The mites live in the scales of the buds, suck out the sap, and cause the buds to swell to an abnormal size. They commonly infest the buds of the Wild Hazel. Picking off and burning the swollen buds is the only remedy.

Nut Weevil (*Balaninus nucus*).—The weevils, which are tawny coloured and about $\frac{1}{2}$ in. long, bore a hole into the young nut with their beaks or rostrums, and then deposit a single egg therein. In about ten days a creamy-white maggot appears, and feeds on the kernel until it is full grown; then it gnaws its way out, descends to the soil, forms a cell, and remains therein till spring, when it pupates, and appears as a weevil in June. The weevils feed on the foliage during the summer. Spraying the foliage with an arsenate of lead wash in June seems to be the only way of killing the beetle.

Other Pests.—The larvæ of the Winter, Mottled Umber, and Buff-tip Moths, also various leaf weevils, feed on the foliage.

Peach and Nectarine Pests.

Peach Aphis (*Aphis amygdali*).—A species of aphis which infests the young foliage, sucking out the sap, and causing the leaves to curl. Spraying with a soft soap and quassia solution is the only remedy.

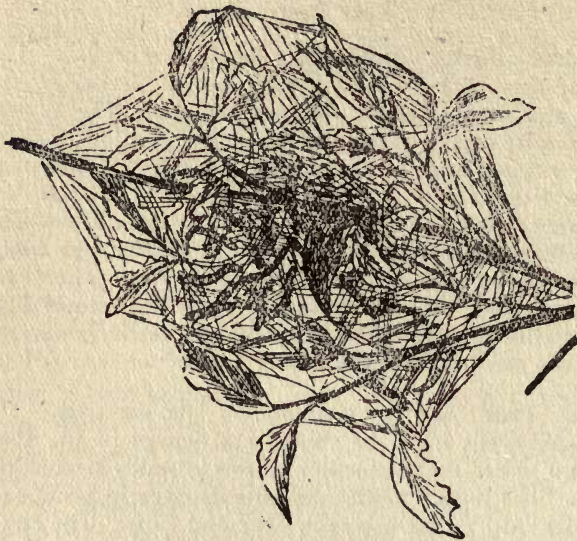
Peach Scale (*Lecanium persicæ*).—Usually attacks Peach trees grown under glass only, but is occasionally to be found on outdoor trees. Infests both leaves and shoots, and is best got rid of by spraying the trees in winter with a caustic alkali wash.

Pear Pests.

Pear-leaf Blister Moth (*Cemiosstoma scitella*).—The larvæ of this moth feed on the inner soft tissues of the leaves, and cause blisters to form thereon. The female moth lays its eggs on the under sides of the leaves from May to August, and the subsequent larvæ gnaw their way into the tissues and feed upon them. The blisters are brownish at first, changing later to a dark hue. The injured leaves in due course die and fall off. The larvæ are greenish in colour, and about $\frac{1}{4}$ in. long. There are two broods in a season. Spraying with arsenate of lead in May to destroy the young larvæ before they have entered the leaves seems to be the only remedy.

Social Pear Sawfly (*Pamphilius flaviventris*).—The larvæ spin webs over the shoots and leaves of the Pear tree, and under the protection of this greedily devour the foliage. The female sawfly deposits its eggs in groups on the under sides of the leaves in May and June. The larvæ appear in about ten days, and at once begin to spin a large web. Therein they devour the leaves within reach, and when the supply is exhausted they move further on, spin another web, and again make a raid on the neighbouring foliage. They go on thus for about five weeks, then lower themselves to the ground by a silken thread, enter the soil, form a cocoon, remain in this until spring, when they enter the pupal stage, and appear as sawflies in May. When this pest appears, the webs or nests of larvæ should be cut off and promptly destroyed. A soil fumigant should also be dug into the ground in autumn to kill the hibernating larvæ. (Fig. 132.)

Pear Midge (*Diplosis pyrivora*).—This is a terrible pest in some seasons, the maggots infesting the young fruits and completely destroying them. The midges appear in April, deposit their eggs in the blossom either before it has expanded or just afterwards, and in ten days small yellowish-white maggots are produced. The maggots, to



This illustration shows a colony of the larvae feeding under the protection of a web.



Fig. 132. SOCIAL PEAR SAWFLY AND LARVA.

the number of a dozen or more, at once tunnel into each young fruit and devour the pulp. As soon as they reach maturity they quit the fruit, fall to the ground, form a cocoon, and pupate later on. Fruit attacked cannot, of course, develop, and it therefore falls off. The young infested fruits should be gathered and burnt, and the soil dressed with a fumigant. such as "vaporite."

Pear Leaf Blister Mite (*Eriophyes pyri*).—A gall mite which enters the young leaves through their stomata, forms galls or small blisters, deposits its eggs therein, which in turn hatch into larvæ that increase the injury to the foliage. During the winter the mites live in the scales of the leaf-buds. The blisters are reddish at first, and brown or black later on. The mites attack the young fruits also, and prevent their developing. Leaves badly attacked by this pest eventually die and fall. Spraying with a lime-sulphur wash in winter is an excellent remedy. Badly-blistered leaves should be picked off and burnt.

Other Pests.—The Winter, Mottled Umber, and Lackey Moth larvæ feed on the foliage; those of the Wood Leopard and Goat Moths on the inner wood of the trunks; the Fruit Bark Beetle forms tunnels in the bark; the Cherry Slugworm feeds on the leaves; the Apple Blossom Weevil maggots injure the blossoms; and the American Blight infests the shoots, etc. See previous sections for descriptions of these pests.

Plum and Damson Pests.

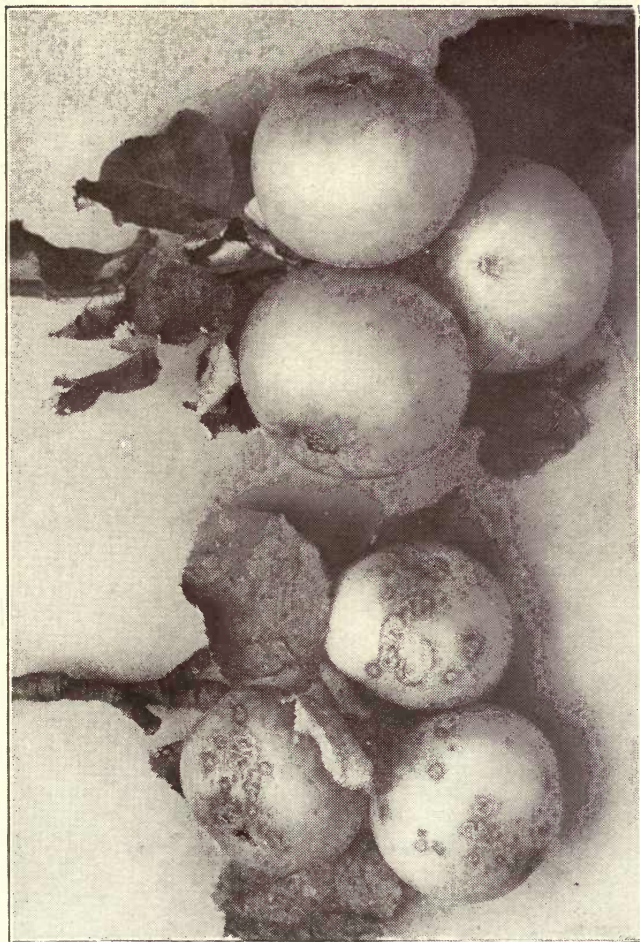
Plum Aphis (*Aphis pruni*).—A pest which does considerable injury to the foliage of the Plum and Damson in some seasons. The first brood is hatched in early spring from eggs laid on the shoots the previous autumn. These and successive generations produce their young alive. The females are wingless up to a certain period, then winged ones, together with winged males, appear,

the final brood laying eggs on the shoots in autumn. The purplish-brown lice puncture the rind of the shoots, suck out the sap, and cause the leaves to curl and eventually to shrivel and die. The trees should be sprayed in February with a lime-sulphur wash to kill the eggs. Spring spraying, either just before the buds open or after the petals have fallen, to kill the first brood of female aphides, is also desirable.

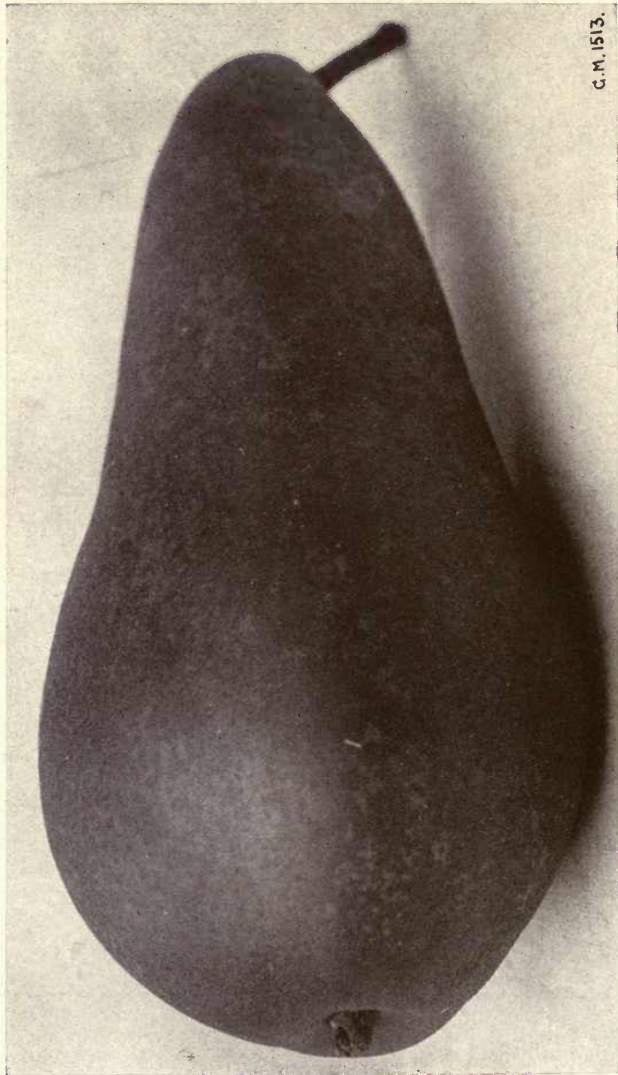
Mealy Plum Aphis (*Hyalopterus pruni*).—Another aphid, with pale green bodies covered with a dense coating of mealy secretion. They congregate in clusters on the under sides of the leaves, and in time cover the surface with a sticky substance called honeydew. The lice appear in early summer, and disappear before autumn. There are wingless and winged females, the latter flying from tree to tree. Spraying with an insecticide when the pest is first seen is the best remedy.

Red Plum Maggot (*Opadea funebrana*).—This is the larva of a small moth. The latter lays an egg at the base of the stalk of a fruit in June or July. In due course a maggot appears, and gnaws its way into the fruit, feeding on the flesh. The maggot, which has a reddish body and a brown head, reaches maturity early in September, when it quits the fruit, spins a cocoon in crevices of the bark, pupates in spring, and appears as a moth the following June. These maggots spoil the value of the fruit for eating. Fruit which ripens prematurely should be examined, and if infested be promptly burnt. Grease-banding should also be practised.

Plum Sawfly (*Cladius padus*).—The larvæ feed on the surface of the leaves, devouring the soft parts, but leaving the upper epidermis intact. The females lay their eggs on the under surface in May and June, and the latter hatch out in about eight days. The larvæ are pale green in their younger stages, and of a darker green shade, with an orange-coloured head, as they increase in age. When three weeks old the first brood of larvæ descend to the



APPLE FRUITS ATTACKED BY THE SCAB DISEASE.
The left hand trio of fruits show the scabs produced by the fungus, and the next trio are specimens free from disease.



G. M. 1513.

DESSERT PEAR, CONFERENCE.
Season : October.

soil, form a cocoon, pupate, and appear as moths in a few weeks. The females again lay eggs, producing a second brood, which pass the winter in cocoons in the soil, enter the pupal stage in April, and appear as moths in May. Spray with an arsenate of lead wash as soon as the insects are seen. In autumn, too, fork a soil fumigant into the soil.

Oyster-shell Bark Louse (*Aspidiotus ostræformis*).—A scale insect which infests the trunks, branches, and shoots of the Plum and other fruit trees. The scaly covering of the insect resembles an oyster-shell in shape. The wingless female insects deposit their eggs on the shoots in April and May, and the larvæ appear in June. They crawl about the branches for a short time, then attach themselves permanently to the bark, pierce the latter with their beak-like mouths, and suck out the sap. In autumn each larva forms an oyster-like scale over its body, under which it lives until it reaches maturity the following April, and commences to lay eggs. Spray the trees in winter with a caustic alkali wash to kill the pest.

Plum Fruit Sawfly (*Hopllocampo fulvicornis*).—The larvæ of this sawfly attack the young fruit of the Plum, feed on the fleshy interior, and cause it to fall off in an early stage of its growth. The sawfly deposits an egg in the unopened flower bud in April or May. In a week or so a larva appears, and begins to eat its way into the young fruit. The larvæ are creamy-white or pinkish in colour, and have a brown head. They attain maturity in July; then leave the fruit, enter the soil, and spin cocoons, remaining thus until February, when they enter the pupal stage and appear as sawflies in April and May. Gather and burn all fruits attacked, and fork a soil fumigant into the ground around the tree in autumn to destroy the cocoons.

Other Pests.—The larvæ of the Winter, Mottled Umber, March, and Vapourer Moths, Pear Slugworm, and Social Pear Sawfly feed upon the foliage; the larvæ of the Wood

Leopard and Goat Moth, also the Bark and Shot Borer Beetles, infest the wood and bark; Weevils feed on the foliage; and the Mussel Scale and Brown Scale infest the shoots and branches of the Plum. These are dealt with in other sections.

Raspberry and Loganberry Pests.

Raspberry Moth (*Lampronia rubiella*).—The small larvæ of this moth infest the buds and shoots of the Raspberry, feed on the pith, causing the canes to wither and die. The moth appears in May and June, and lays its eggs in the flowers. Larvæ appear in about a week, and enter the core of the berry. Here they remain until the fruit begins to ripen, when they depart, spin cocoons attached to crevices in the bark of the canes or the root stock, and remain thus until spring. They then leave the cocoons, bore their way into the nearest growth bud, and gradually tunnel through the pith. The result is the withering of the young shoot. The larva is of a pinkish hue, and about $\frac{1}{4}$ in. long. It pupates in the base of the shoot or among the dead leaves, and appears as a moth in May. Canes with shrivelled shoots should be promptly cut off and burnt. A dressing of lime should also be raked into the soil around the base of the stools in early spring, and one or two sprayings of arsenate of lead given in late May and early June. All loose rubbish should be collected and burnt. Also attacks loganberries.

Raspberry Beetle (*Byturus tomentosus*).—The maggots of this beetle attack the fruits of the Raspberry, Blackberry, and Loganberry, and so damage them that they are unfit for food. The beetles also feed upon the blossoms and buds. The beetles appear in May, and deposit their eggs in the blossoms. Larvæ appear in due course, penetrate the receptacle of the berry, and then feed upon it, causing it eventually to shrivel and fall off. The larvæ are yellowish in colour with brown markings, the head being brown and flattish in shape. They frequently crawl

from one fruit to another, and thus do an immense amount of mischief. When fully grown, the larvæ pupate in the soil or in crevices of the bark of the canes, and appear in the beetle form in spring. The beetle is about 1-7th-inch long, has a dark brown body covered with a golden pubescence, and is very active in sunny weather. All canes that are cut away in autumn should be promptly burnt. Dress the soil around the stools with lime and soot in autumn, and rake both in. Smear some sacks

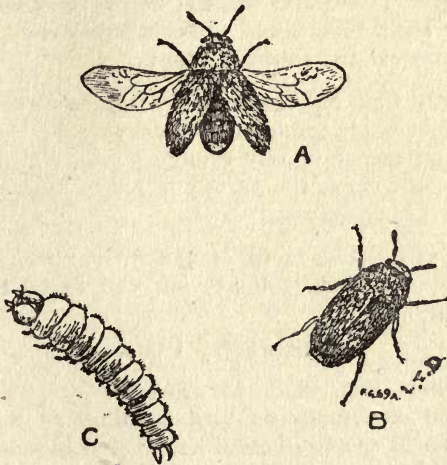


Fig. 133. RASPBERRY BEETLE (*BYTURUS TOMENTOSUS*).

A, Beetle flying. B, At rest. C, Larva; all magnified.

with tar, and on dull, warm days in May and June shake the canes over these; then the beetles will fall on to the former and be caught. Spraying with arsenate of lead in May and June would kill many of the beetles. (Fig. 133.)

Raspberry Weevil (*Otiorynchus picipes*).—This oblong, pitchy-coloured weevil is a very destructive pest which feeds on the blossoms, fruit buds, young shoots, and leaves. It carries on its destructive work at night, and

during the day hides in the soil. These weevils are crafty creatures, falling off the plants the instant the latter are touched, and simulating death. The best way to catch them is to go quietly along the sides of the plants at night with tarred sacks or boards, and to suddenly shake the canes over them. A dark lantern or an electric hand-lamp, the light of which can be flashed on, will cause the weevils to drop on to the tarred sacks. Spraying at night with arsenate of lead is a good remedy. Dressings of soil fumigant raked into the soil by day will also kill the weevils. The white, fleshy grubs of this weevil live in the ground, and eat the roots of plants.

Raspberry Gall Fly (*Lasiopteri rubi*).—Sometimes galls or excrescences are found on Raspberry canes. These are due to the presence of tiny orange larvæ, which puncture the tissues and cause the parts affected to become swollen. Cut off and burn infested canes.

Other Pests.—The larvæ of various moths, also Chafer Beetles, feed on the foliage, but the harm they do is very slight.

Strawberry Pests.

Eelworms.—Two kinds of eelworms infest Strawberry plants, and sometimes do serious injury to them. The kind known as the Root Eelworm (*Tylenchus devastatrix*) is a microscopic species of thread-like worm which infests the tissues of the roots, and causes the plants to decay and die. They are also to be found in decayed manure and in sour, damp soils. Another kind, called the Cauliflower Disease Eelworm (*Aphelenchus fragariæ*), infests the stems, leaves, and flower buds, causing the latter especially to develop into a cauliflower-like mass of swollen growths, and the entire plant to sicken and die. Here, again, the eelworms live and breed in the tissues. All diseased plants should be burnt, and the soil liberally dressed with ground lime. Spent hops are particularly liable to encourage the presence of eelworms.

Slugs and Snails.—Three kinds of slugs—namely, *Arion ater* (Black Slug), *Agriolimax agrestis* (Grey Field Slug), and the Black-striped Slug (*Leinax maximus*)—do considerable damage to the foliage, the blossoms, and the fruit. All three are reproduced from eggs laid in the soil. There is also a species of snail (*Helix rupescens*), with a yellowish-brown body and dark brown stripes along the neck and tentacles, which feeds on the young leaves and fruit at night. Before strawing the beds give the soil a good dressing of soot, or a mixture of one part of lime, and ten parts of naphthalene, to one hundred parts of fine cinder-ashes.

Miscellaneous Pests.

Wasps.—These attack the ripe fruits of the Plum, Pear, Apricot, Peach, Nectarine, and Vine, and in some seasons play serious havoc with the former. In the case of Vines cover all ventilators or open spaces in vineries with muslin when the berries begin to ripen. A framework covered with muslin should also be used in the doorways if the doors are to be left open for ventilating purposes. Wide-mouthed jars should be partly filled with treacle and water or stale beer, and suspended in the branches of outdoor fruit trees to trap the insects. Wherever possible it is desirable to discover the nests, and at night destroy these by inserting squibs of damp gunpowder and igniting these, or cotton wool saturated with cyanide of potassium, in both cases immediately sealing up the hole, and later on digging out and destroying the nests.

Rabbits and Hares.—These quadrupeds do considerable mischief by gnawing off the bark of young fruit trees. The best preventive remedy is to enclose the lower 3ft. of the trunk in small-mesh wire netting. In the case of attack prepare a mixture of fresh cow-dung, clay, and water, of the consistency of paint, and to each pailful add a teaspoonful of tincture of assafœtida. Smear the bark, and the wounded parts especially, with this pigment.

Birds.—Blackbirds, thrushes, and starlings eat the fruits of the Strawberry, Cherry, etc., and sometimes the Apple and Pear. Strawberry beds should be covered with fish-netting, and the same remarks apply to Gooseberry and Currant trees and other fruits grown on walls. Bullfinches and titmice peck off the fruit buds in winter, and sparrows occasionally also do considerable damage in spring by pecking off the blossoms. Covering the trees with fish-netting is the only remedy in the latter case, and syringing the bushes in winter with a lime sulphur, and salt wash will prevent the former destroying the buds.

CHAPTER VIII.

FRUIT DISEASES.

The Apple and Pear.

Apple Mildew (*Spaerotheca mali*).—This fungus appears in the form of a dense white powdery film on the young shoots and leaves of old Apple trees during the summer, and seriously injures the growth. Spraying the tree as soon as the disease is discovered with a solution of sulphide of potassium is the only remedy.

Apple Scab (*Venturia inequalis*).—A disease which appears in early summer, mainly on the upper side of the leaves, in the form of black spots. In due course the spots become confluent, and form olive-coloured patches on the leaves. The young shoots are also attacked. Later the disease spreads to the fruit, and black sunken scabs develop thereon; the rind, or skin, also cracks, and the fruit is consequently rendered unusable. The remedies are, first of all, to cut off as far as possible all diseased shoots, leaves, and fruits, and burn them. In spring, just before the leaf-buds open, spray with Bordeaux mixture, and again with a weaker solution when the leaves are half-expanded.

Apple Rot (*Gloesporium fructigena*).—This appears on the fruit in the form of pale brown spots under the skin. Later sunken patches form, and the fungus develops a series of small black points arranged in concentric circles. The result of an attack is the early maturation and falling off of the fruit. The disease also causes cankerly warts on the shoots or branches. Needless to say, all diseased fruits should be immediately burnt, and any shoots having the cankerly warts on them be also

cut off and burnt. The best preventive remedy is to spray the tree with Bordeaux mixture before the flower-buds open, and again at intervals during the summer.

Canker (*Nectria ditissima*).—A disease which is, unfortunately, too common, especially on fruit trees grown in badly-drained or damp soils. Careless pruning also contributes to the development of this disease. The fungus first develops in any wounds or cracks in the bark, and gradually causes the decay of the tissues. The wounds caused by an infestation of American Blight are frequently attacked by this fungus. The ultimate result of an attack is the complete decay of the bark and the death of the branch. Badly attacked trees should be burnt, as there is no possible cure in such a case. Where the attack is only slight, cut off the diseased branches, or pare away all diseased parts to healthy tissue, and then paint the wounds with Stockholm tar. Sorts like Cox's Orange, King of the Pippins, and Lord Suffield are especially liable to canker attack if grown in damp soils; therefore plant these only on well-drained soils.

Coral Spot Disease (*Nectria cinnabarina*).—This disease flourishes mainly on dead wood, but it will develop on living trees if there are any fractures in the bark. Its appearance may be easily detected by a colony of bright coral-red spots on the bark. All dead wood covered with red spots or warts should be burnt; and in the case of a living tree cut off and burn all diseased parts, then paint the wounds with Stockholm tar.

Apple Blotch (*Phyllosticha solitaria*).—A disease which attacks both the leaves and fruits of the Apple. It appears in the form of yellowish or brownish patches on the leaves, also as cankerous warts on the shoots, and frequently causes the fruits to crack. Spraying with Bordeaux mixture before the flower-buds expand, again when the petals have fallen, and at frequent intervals during the summer, is the best remedy for this disease.

Pear-leaf Cluster-Cups (*Gymnosporangium sabinæ*).—Not a serious disease. It produces rugged swellings on the leaves. Burn infected leaves.

Pear Scab (*Venturia pirina*).—A similar disease to the Apple Scab, previously described. Same remedies apply.

Stone Fruits.

Apricot Brown Rot.—See Apple Rot Disease, in previous section.

Cherry-leaf Scorch (*Gnomonia erythrostoma*).—A disease which attacks the leaves and eventually the leaf-stalks. The result is, the sap is prevented passing to the leaves, and they consequently wither, and have the appearance of having been scorched. The dead leaves hang on to the shoots until the following year. Gathering and burning all withered foliage in winter or earlier is the only remedy.

Cherry Mildew (*Podosphæra oxyacanthæ*).—This forms white powdery patches on both sides of the leaves, and in cases of a bad attack seriously cripples the growth of the tree. Spraying with Bordeaux mixture at half the usual strength when the leaves are young checks the development of this fungus.

Peach-leaf Curl (*Exoascus deformans*).—Leaves of the Peach and Nectarine are frequently attacked by this fungus. The leaves have a puckered and swollen appearance, and are coated with a whitish mould, similar to mildew. The disease prevents the leaves carrying on their proper functions, and hence they soon become sickly and die. The mycelium of the fungus lives in the young shoots, and then passes on to the leaves. Infected leaves should be removed early and burnt, and it is a good plan to also remove and burn shoots that have borne infected leaves. Spraying with Bordeaux mixture before the flower-buds expand will do much towards checking the spread of the disease.

Bladder Plum Disease (*Exoascus pruni*).—This fungus attacks the fruit of the Plum and Damson. The mycelium enters the embryo of the flower, and when the fruit forms it develops a bladder-like shape, hollow within, and stoneless. As the mycelium of the fungus lives in the tissues of the shoots, the only remedy is to cut off and burn those that bear the bladder-like fruits.

Gumming Disease (*Coryneum beyerinckii*).—This disease attacks the Apricot, Cherry, Plum, and Peach. It appears in the form of red patches on the under surface of the leaves. In due course the disease develops, causes the parts attacked to become dry, fall out, and leave circular holes in the leaves. It also attacks the shoots, and causes a gummy substance to ooze out. Another fungus (*Cladosporium epiphyceum*) also causes gum to ooze out of the branches. Cut off and burn all shoots attacked.

Silver-leaf Disease.—The Plum, Peach, and Apricot have of late years been attacked by a disease which causes the leaves to assume a silvery hue. Some authorities consider it to be caused by a fungus (*Stereum purpureum*), but Mr. George Masee, F.L.S., the well-known mycologist, holds a contrary opinion. Anyway, whatever the cause may be, trees attacked do not survive for more than two or three years. Many remedies have been tried as a cure or a preventive, but all have so far failed to act. Clearly, the only course is to uproot and burn all diseased trees.

Currants and Gooseberries.

American Gooseberry Mildew (*Spærotheca mors-uvæ*).—This is a very serious disease, which, had it not been for the timely action of the Board of Agriculture in taking stringent steps to stamp it out, might have annihilated the Gooseberry in this country. It appears about May, in the form of a delicate cobweb-like, white film, and later becomes mealy on the young leaf-buds, then on the shoots and fruit. The fungus develops with alarming rapidity,

and is easily dispersed by the agency of wind, rain, insects, and birds, to other bushes, thus infecting a whole plantation in a short period. During the winter the mildew changes to a dark brown hue, and remains in the mycelium stage in the points of the shoots till spring, then infects the new growth. Under the provisions of the Destructive Insects and Pests Act, 1887 and 1907, this disease is scheduled as a notifiable one; consequently anyone suspecting it to be present on his bushes must, under a penalty of £10 in default, notify the fact to the local inspector appointed under the Act, or direct to the Board. The officials will inspect the bushes, and, if they are infected with the disease, instruct the grower what to do to get rid of it.

Gooseberry Black-Knot (*Plowrightia ribesia*).—A parasitic fungus which develops in wounds, and causes the foliage to wilt, turn yellow, and fall off early in the season. The result is feeble growth the next season, and the ultimate death of the shoot or branch. All shoots or branches with yellow, wilted foliage should be cut off and burnt.

Gooseberry Mildew (*Microsphaera grossulariæ*).—Appears on the leaves in summer in the form of a greyish-white mould. Does not infect the shoots or fruit as does the American Mildew. Spray the bushes with a solution of sulphide of potassium when the leaves begin to unfold.

Gooseberry-leaf Cluster Cups (*Puccinia pringsheimiana*).—This fungus appears in the form of tiny cups with whitish, lacinated edges, on the leaves and fruit. Each cup contains orange-coloured spores. Collect and burn all diseased leaves or fruit.

Currant-leaf Spot (*Pseudopeziza ribis*).—This appears on the surface of the fully-grown leaves as blackish spots. The mycelium spreads in the tissues, and prevents the leaves carrying on their functions; hence they die, thus weakening the growth of the tree. Burn all fallen leaves,

and spray the foliage in summer with a solution of sulphide of potassium.

Raspberries and Strawberries.

Raspberry Rust (*Phragmidium rubi-ideæ*).—A fungus which appears on the upper surface of the leaves in early summer in the form of yellowish-brown spots in circular patches. Leaves attacked fall off early, and thus affect the future growth of the canes. Burn all diseased foliage, and spray early in the season with a solution of sulphide of potassium.

Raspberry Spot (*Glœosporium venetum*).—Attacks the young canes and leaves. Appears first as small red spots, then gradually develops into large blotches. The canes the following season produce scanty foliage, and little, if any, fruit. Cut off and burn all diseased canes, and spray in winter with a sulphate of iron solution.

Strawberry-leaf Spot (*Sphærella fragariæ*).—Attacks the leaves in the form of greyish or white spots, with a reddish border. It seriously affects the growth of the plant, and also the yield of fruit. Cut off and burn all infected leaves; in fact, in the case of a bad attack, it is advisable to burn the plants, and to plant a new bed in a fresh site. Spraying before the flowers open with a sulphide of potassium solution is a good preventive.

Strawberry Mildew (*Sphærotheca humuli*).—This disease causes the leaves to curl in the first instance, and then appears as a white mould on the under surface. Also infects the fruit. Spraying with sulphide of potassium directly the disease appears will check its spread. Badly attacked plants are best burnt.

Finally, we commend to the notice of readers of this volume the Author's book, "Garden Foes" (2s. 10d. post free), which contains the life history of, remedies for, and illustrations of the various pests and diseases that attack trees and other crops.

CHAPTER IX.

Causes of Unfruitfulness.

WE receive scores of enquiries every year from readers of "Amateur Gardening," asking us to solve the problem of why their trees fail to yield no, or very little, fruit. It has therefore occurred to us that we might well devote a special chapter to the subject of the chief causes of unfruitfulness in fruit trees, and so help to solve many problems that confront the amateur in his endeavour to grow fruit successfully. These we will proceed to deal with under various heads, as follows:

1. Sterility of the Blossoms.—Up to a few years ago it was generally assumed that the chief cause of fruit trees failing to produce fruit, notwithstanding the abundant crop of blossom, was the result of injury by late spring frosts. Now, while undoubtedly the latter is responsible in some seasons for a paucity of fruit, scientists have discovered that there is another cause for the failure, and that is a physiological defect in the floral organs, namely, the inability of the pollen grains of some varieties to possess the potency for fertilising the ovaries. For some time, therefore, both here and in America, experts have been making a close study of the subject of pollination, as applied to fruit trees, and they have, as a result, discovered that some varieties of apples, pears, plums, and cherries are self-sterile, i.e., incapable of fertilising their flowers with their own pollen; while others are self-fertile and capable of self-fertilisation with their own pollen. Considerable progress has been made in determining the self-sterility and self-fertility of apples, plums, and cherries, and also in a small degree of pears. Those varieties in each class of fruit that have been definitely stated to be self-sterile or self-fertile are noted in the lists of varieties published in the foregoing pages.

The discovery practically means that certain varieties can only have their ovaries fertilised by pollen obtained from another variety, conveyed either by the agency of bees or other insects, by wind, or by the aid of man. Apparently, while a variety cannot pollinate itself by means of its own pollen, yet it is capable of being fertilised by that from another variety, even though it may be self-sterile itself. To pollinate self-sterile varieties successfully, there must, therefore, be plenty of bees about to collect pollen from other trees that are in blossom at the same time. Hence, it follows that if a single apple tree of a self-sterile variety, like Cox's Orange Pippin, be grown only there is a risk of no fruit being produced, because, unless there are apple trees grown in adjoining gardens, there would be no supply of potent pollen available.

The obvious remedy is to grow self-fertile and self-sterile sorts together, then if there are plenty of bees about, pollination will be assured. Then, wherever possible, one or two hives of bees should be kept in every garden where fruit is grown largely, and in the case of extensive fruit gardens, no less than 40 hives should be kept for every 160 acres of plantation. Where there are only a few trees it would be a good plan to hand-pollinate the blossoms on fine days by means of a rabbit's tail fixed to a stick.

And it is not only the fruits mentioned that require the aid of bees and insects to ensure perfect pollination of the blossoms. The pollen grains in the flowers of the gooseberry and currant are of a glutinous nature, and hence cannot be conveyed from one tree to another without the assistance of insects. Nor can raspberries, nor loganberries, do so effectively without such aid. Cobnuts and filberts are pollinated easily by wind agency. Grapes, again, also peaches and nectarines grown under glass, require hand or insect pollination. Old-fashioned gardeners made a practice of placing a hive of bees in their

orchard and peach houses during the flowering period to assist in the distribution of pollen.

Another simple method of pollination of self-sterile varieties is to place trusses of blossoms of a fertile variety among the branches of the former on bright, sunny days. Insects on the wing would then visit these trusses and convey the pollen to the other flowers. Such a method, of course, is only practicable in the case of a few trees.

2. Frost.—Fruit trees growing in low-lying, damp positions are apt to have their floral organs seriously damaged by late spring frosts. It frequently happens that the entire crop of fruit is lost in such a case, and unfortunately there seems no really successful way of combating the injury. The various methods in vogue for the protection of fruit blossoms are described in the next chapter, so that we need not discuss them here. Readers who cultivate fruit trees in low, damp, or exposed positions, and who fail to secure good crops of fruit must therefore not attribute the loss to sterility of the blossoms alone, as frost and cold winds may, in such a case, be the real causes.

3. Faulty Pruning.—The failure of trees to produce flowers or fruit may often be traced to faulty pruning. Trees are often planted in positions unsuitable for enabling them to attain their natural fruiting size, as standards in small gardens, or espaliers or fan-trained trees on low walls or fences. To keep these trees within the required limit of space severe pruning of the shoots is practised annually, with the result that they make rank annual growths, which fail to ripen and develop fruit buds. This erroneous practice, moreover, encourages excessive root production, and makes matters still worse. Strict attention should therefore be paid to the instructions given in the chapters on pruning and training. Moreover, care should be taken not to plant trees in positions where they are unable to develop to their normal size. Judicious periodical root pruning is also essential to maintain a due balance between root and branch growth.

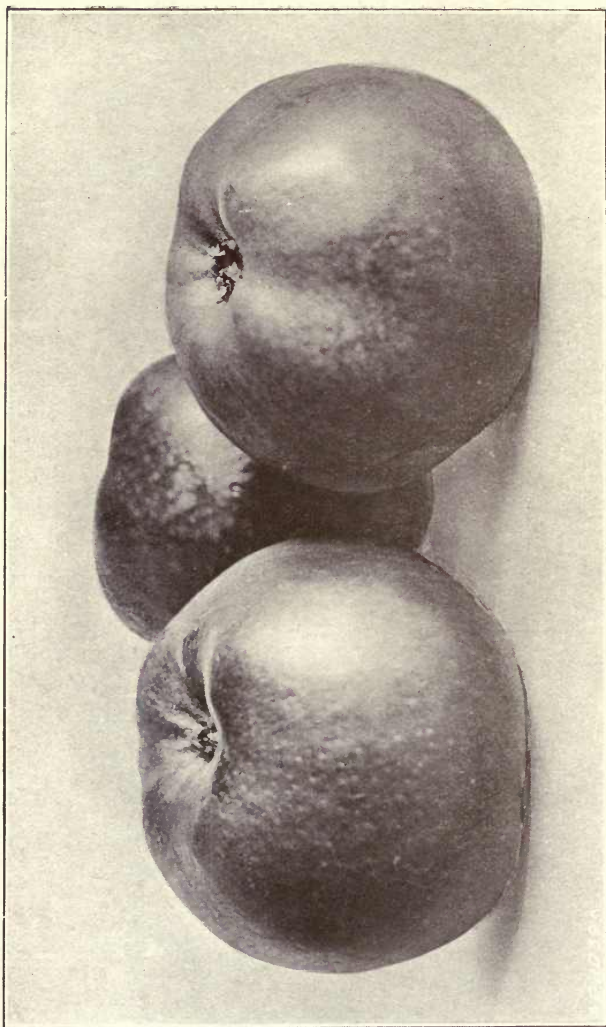
4. Damage by Pests.—A common cause of unfruitfulness is allowing the buds, blossoms, young fruit, shoots, and branches to be damaged by insect and fungoid pests. Hence, particular care should be paid to the importance of winter and summer spraying, grease-banding, etc., as advised elsewhere in this work. Trees cannot make healthy, normal growth, nor can they bear blossoms possessing the necessary stamina to ensure perfect fertilisation of their ovaries, if their growth be crippled by the action of pests.

5. Conclusions.—The obvious lessons to be learnt from the foregoing facts are: (a) Self-fertile and self-sterile varieties should be grown in conjunction; (b) due care must be made to the protection of the trees whilst in blossom; (c) proper attention must be paid to plant trees suitable to the positions they are intended to occupy, also to skilful pruning; (d) avoid permitting pests and diseases gaining a foothold on the trees; (e) finally, be careful as to the proper selection and treatment of soils, the use of suitable manures, and the general methods of cultivation as laid down in these pages, then there would be fewer instances of unfruitfulness.



SUMMER RASPBERRY, THE DEVON.

A vigorous-growing and free-fruited Raspberry, bearing large bright crimson fruits of splendid flavour.



DESSERT APPLE, MRS PHILLIMCRE.

Season : November to February.

CHAPTER X.

Protecting Fruit Trees.

TREES that grow against walls and flower early require some protection from frost and cold winds during the blossoming period. We refer to Peaches, Nectarines, and Apricots more especially; but in cold positions early Pears, Plums, and Cherries are all the better for some protection whilst the trees are in blossom. The protection should be given as soon as the flower buds begin to show colour, and be continued until the fruit has set. Indeed, should frosty weather prevail, it should be prolonged until the latter has disappeared.

Glass Copings.—For large gardens, with high walls, portable glass copings afford the most perfect and satisfactory way of protecting trees in blossom. These are formed of glazed sashes, 2ft. or 2ft. 6in. wide, and 6ft. 7in. in length. They are made to slide in iron brackets fixed in iron brackets permanently bolted to the wall. When not required for protective purposes, the sashes can be easily removed and used as lights for garden frames. The average cost is 2s. 3d. to 2s. 8d. per foot run. By means of curtain rods and metal rings, blinds can be attached to the lower part of the coping, and the latter drawn back by day or closed by night, as the state of the weather demands. The trees are just protected from rain or frost whilst in flower. (Fig. 134.)

Canvas Blinds.—A simpler method is to place stout poles at intervals of 6ft., the top resting against the wall, and the base on the ground 2ft. from the wall. To the top of each pole affix a metal ring, and about 2ft. from the ground fix a stout peg, about a foot long, in the pole. To the upper side of the canvas fix rings 6ft. apart, secure

a piece of rope to each, and run the opposite end through the ring in the top of the hole. This will enable the blind to be drawn up at night and lowered by day. Scrim canvas or tiffany are suitable materials to use for the blinds.

Fish Netting.—Old fish-netting or tanned whipcord-netting also forms good protective material, but is not so frost proof as the combined coping and canvas, or the canvas alone. Either should be used of double thickness, and supported by poles placed 6ft. apart. This may be left on day and night until the fruit has set.

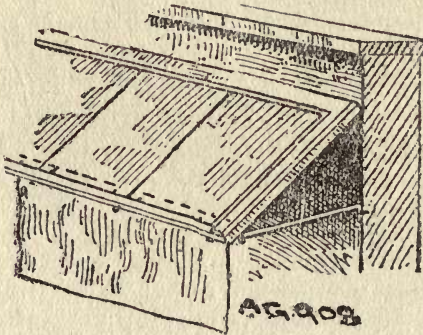


Fig. 134. A FRUIT PROTECTOR FOR WALLS.

Consists of a glass coping with provision for suspending a tiffany blind in front on cold days and frosty nights.

Trees in the Open.—It is rarely necessary to protect trees in the open garden unless the weather is likely to be very severe at the time of blossoming. Even then only dwarf, pyramid, or espalier trees can be conveniently protected. For bushes or pyramids, place stakes about 2ft. apart, 1ft. from the branches, and a trifle higher than the tree. Around these fix scrim canvas or tiffany, leaving the top exposed. For espaliers, fix stakes the height of the trees, 3ft. apart and 1ft. from the sides, along both sides, and secure canvas thereto during the flowering

period. Gooseberry and Currant bushes may be protected by placing some straw over them in frosty weather only. In all cases, do not fix the lower edge of the canvas nearer than 18in. from the ground.

Protecting Orchard Trees.—In America fruit growers have long adopted a method of protecting orchard tree blossoms from injury by frost by means of "smudge" fires. The idea has been practised in England also with good results. A special form of heater is used for the purpose, and about fifty of them are required per acre, placed at even distances apart. The apparatus has to be charged with a handful of cotton waste saturated with petroleum oil, then one of firewood, and finally some coal. A cover has then to be placed on top. When frost is imminent, the contents of the heater are ignited by means of a torch of wire and cotton-waste saturated with oil. The smoke from the consuming fuel is then emitted in a steady, dense volume, completely enveloping the trees, and effectually warding off the frost. The cost per acre for keeping fires burning for one night is estimated at 20s. to 25s. To guard against a sudden visitation of frost, up-to-date growers have a thermometer fixed up in an exposed place near the house, and this connected with an electric alarm-bell situate in the bedroom of the owner or his foreman. If the temperature descends to freezing point, the bell is instantly set ringing, and then is the time to light the heaters. Another method is to start wood fires at intervals about 20ft. apart in the plantation. In both cases the materials should always be in readiness, and, needless to say, only employed when there is a danger of severe frost setting in. Special heaters are manufactured and sold in this country, the cost of which would amount to at least £7 to £10 per acre, so that "smudging" is after all rather an expensive method of protecting fruit blossoms.



Part III.—MARKET CULTURE.

CHAPTER I.

ORCHARDS.

THE cultivation of fruit in grass orchards has been practised for ages in this country, and certainly there is no sylvan scene so picturesque and beautiful in springtime as an orchard of Apple blossom, or so ruddy and glowing in effect as one of trees of ripening fruit in autumn. The orchards of Devon, Somerset, Gloucester, Hereford, Worcester, and Kent have long been famous for yielding fruit for producing that delicious beverage known as cider, as well as many luscious eating and useful cooking Apples. But, since experience has demonstrated that much finer samples of fruit can be produced on dwarf trees and in cultivated land, the old-time grass orchard, with all its charm and picturesque beauty, has lost a good deal of its former popularity. There is no doubt that the only point in favour of the grass orchard, from a utilitarian view, is that it affords shelter in summer days for cattle and other stock; and is, moreover, well adapted for poultry keeping. On that account grass orchards are not likely to disappear in our rural districts yet awhile, at any rate.

Granted, then, that a grass orchard serves the two-fold purpose of affording shelter for stock and fowls, as well as yielding fruit, it naturally follows that in the present work we should devote a chapter to the subject. Besides,

it does not necessarily follow that the cultivation of fruit trees in grass should take the form of an orchard. There are many gardens in which one or more fruit trees might be grown on the lawn as shelter trees, as well as for yielding fruit; and, as the cultural details are precisely the same for both, the remarks hereafter given will apply to the two methods of cultivation.

Site.—So far as the orchard is concerned, the first question to settle is the site. The ideal position would be land sloping to the south-west. Trees grown thus are not so likely to have their blossoms injured by frost as on a south or south-east aspect. In both the latter cases the early morning sun is apt to cause a sudden thaw of the frozen blooms, and thus destroy the organs of fructification. Orchards, too, should never be placed in damp, low-lying situations below the fog line, as in such positions there would be a great risk of injury to the blossoms by late frosts. Keep well above the fog line.

Shelter.—In exposed positions shelter from the east and north winds and south-westerly gales is indispensable. Formerly it was the practice to plant forest trees, as elms, poplars, etc., to act as shelter trees, but this was a most unwise plan, as the roots of both travel a good distance, and rob the adjoining fruit trees of a good deal of their sustenance. A far better plan is to plant Damsons, or such hardy Pears as Fertility, Chalk, Lammas, and Bishop's Thumb; or Apples, as Northern Greening, Afriston, Annie Elizabeth, and Royal Jubilee, round the eastern, northern, and south-western boundaries. These, planted in a zigzag fashion 12ft. apart, would soon form a dense shelter, and yield plenty of fruit into the bargain.

Soil.—For Apples, a deep, well-drained loam or marl is preferable. Light, gravelly, sandy, or chalky soils do not give good results. Pears do best on a lighter or medium soil; Plums succeed satisfactorily on a soil inclined to be heavy; and Cherries require a moderately

light soil. Damsons also need a heavy soil. In all cases it is essential that the depth of soil should be from 2ft. to 3ft. Shallow soils overlying chalk or gravel are rarely satisfactory, the trees soon becoming stunted in growth, cankerous, and unfruitful.

There are two methods of preparing the soil for trees in grass orchards. One—and by far the best—is to trench the site 2ft. deep, and break up the subsoil and give it a good dressing of manure—40 tons to the acre—and then plant the site with potatoes for the first year. The cultivation required for this crop will put the soil in good tilth for planting in autumn. The following spring the land can be sown with pasture seeds, and thus ensure not only the future success of the trees, but the foundation also of a good permanent pasture. Trees planted in land that has been deeply and wholly dug over have a wider and fuller run for their roots, and hence will make a more rapid and healthy growth than those planted in holes dug out of the pasture.

The second method is adapted for planting in old pastures or in lawns, and consists of digging out holes 9ft. in diameter and 2ft. deep for standards, and 6ft. wide for bush trees. The disadvantage of this plan is, when the roots reach the limit of the holes they have to penetrate the natural soil, which may or may not be of a good texture. If it is of a naturally porous and friable nature, well and good; but if it be clayey or poor, then the roots will not thrive happily in it, and the result will be a check to growth. However, those who prefer to run the risk of adopting this method should first of all pare off the turf and put this on one side, then dig out one spit deep of soil, and place this also on one side. Next take out a trench one spit deep, break up the subsoil with a fork, and turn the soil over it. If, however, this second spit should be of a gravelly, sandy, clayey, or chalky nature, it is well to remove and replace it with good soil. Next replace the turf, chopping this into small pieces and blend-

ing it with the soil. Leave the top spit until the planting takes place. It is a good plan to prepare the holes some time in advance, so that the soil may, by exposure to the weather, be sweetened and made friable.

Distances for Planting.—An orchard may be planted solely with standard Apple or Cherry trees; or with Apples and Pears; Apples, Pears, and Cherries; or Apples, Pears, Plums, and Cherries. In any case, the distance apart each way should not be less than 24ft. At this distance 75 trees will be required to plant an acre of land. Some authorities advocate 30ft. to 40ft.; but, as most folk nowadays want to make the best use of their land, we consider 24ft. to be an ample distance. If bush or pyramid trees are preferred—and these answer well for small orchards which are to be used as poultry runs—12ft. apart is the proper distance. The number of trees required per acre in this case would be 302.

Arrangement of Mixed Orchards.—Where Apples alone are to be grown, it is not advisable to mix the sorts indiscriminately. It is better to plant varieties of spreading and upright growth alternately. Thus, Warner's King, which is of a spreading habit, should be alternated with, say, King of the Pippins, which is an upright grower. Again, if Apples and Pears are decided upon, alternate the Pears with the Apples. If a mixture of Apples, Pears, Plums, and Cherries be preferred, then alternate Plums with Apples in the first row, Cherries with Pears in the second row, and so on. The rows should run from north to south, or from north-east to south-west. (Figs. 135 to 137.)

Planting.—The next thing to consider is the planting of the trees. First of all, drive a stout stake in the centre of each hole. See that it is quite firm. Next get the tree or trees, cut off all jagged or bruised ends of roots, and place the stem close to the stake, then spread out the roots evenly in all directions. Note the soil mark on the stem, and add sufficient soil to cover the roots up to this mark.

As a rule, 3in. to 4in. of soil is ample. Give the tree a gentle shake to settle the soil, and then tread it down firmly. On soils that are inclined to be heavy it is advisable to plant the roots on a level with the surrounding land, the soil over them thus forming a sloping mound. When the planting is finished, wrap a narrow piece of sacking around the stem, and secure this to the stake by means of stout twine or an osier twig. Do not bind too

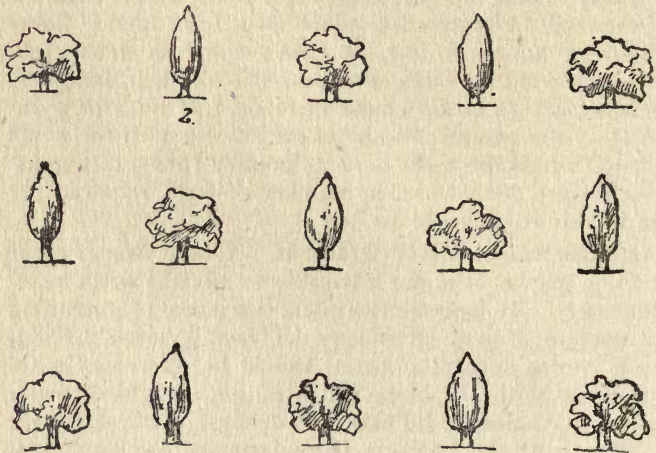


Fig. 135.

A GRASS ORCHARD PLANTED WITH STANDARD FRUIT TREES.

Trees of spreading and upright habit planted alternately.

tightly at first. When the staking is finished, mulch the surface of the soil with stable manure, and let this remain there. We need scarcely remind the reader that no manure must be mixed with the soil in which the trees are to be planted. The surface mulch advised is all that is necessary.

Protecting from Stock.—In each and every case the trees, stems and branches, must be well protected

from grazing animals generally (colts ought never to be seen inside an orchard, as these are most mischievous and destructive), and also rabbits and hares. Nothing answers better than three stout stakes, each disposed 20in. to 2ft. from the tree stem, and equidistant, with barbed wire

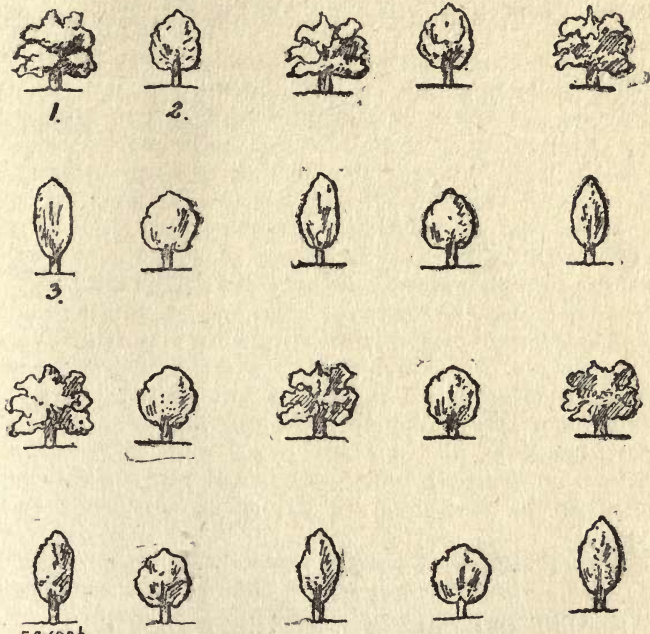


Fig. 136. ANOTHER TYPE OF GRASS ORCHARD PLANTED WITH STANDARD TREES.

(1) Apple trees. (2) Plum trees. (3) Pear trees.

wound thinly around them. Sometimes only two stakes are used, but in this case the wire is dangerously near to the tree stems; and if the latter get loose, as they are too often allowed to do, the bark is liable to be badly injured by contact with the wire. Where barbed wire is objected to,

strips of wood nailed to the posts may be substituted. Various other contrivances are resorted to, including iron tree-guards, which are rather expensive, must be well fixed, and are somewhat difficult to take apart when no longer wanted. Many farmers are content to heavily surround the tree stems with whitethorn bushes, and these answer fairly well if renewed as often as they become rotten.

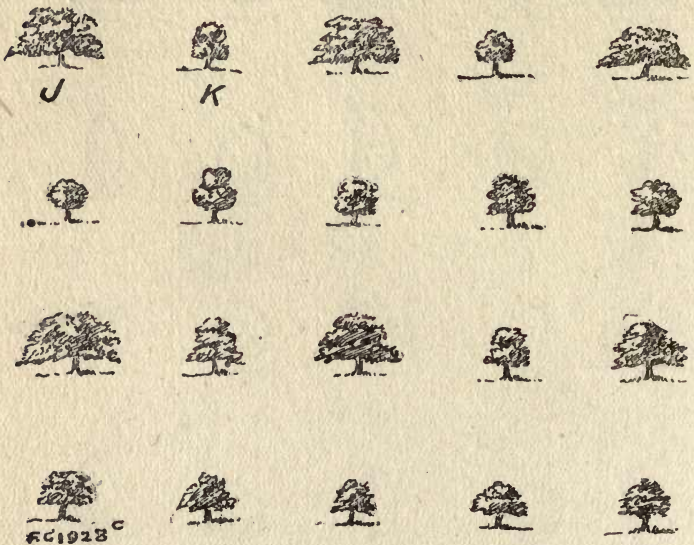


Fig. 137. GRASS ORCHARD OF STANDARD APPLE TREES.

J, Large spreading varieties. *K*, Dwarf growing varieties.

In each and every case keep the tree carefully fastened to the central stake, large numbers having been seriously injured by being allowed to rub against hard substances. All ought to be gone over annually, and all fastenings renewed. In order to keep rabbits and hares from the stems, enclose the lower part of the "cradles," or other forms of tree-guards, with 1in.-mesh galvanised wire net-

ting, taking care to bury a portion of this, and giving the lower edge an outward turn before covering it, and in this way preventing the rabbits from burrowing under.

Pruning.—As regards the pruning of orchard trees, we cannot do better than reproduce the advice given by Mr. W. Iggulden, some years since, in the pages of "Farm and Garden":

"Much of the success attending the efforts of the more experienced and intelligent fruit tree planters is largely due to having pursued rational methods of pruning from the first. Too often trees are stuck in the ground, and allowed to grow as they please; and not a few of those who are anxious to do well mar their initial efforts to failing to prune their trees properly during the first few years they have them. It should be remembered that newly-moved trees have, of necessity, to be severely root-pruned, and root-pruning naturally destroys the balance between the top and root growth, with the result that anything in the shape of vigorous wood growth is out of the question, always supposing that nothing in the shape of restoring the balance by pruning is attempted. If the top growth is checked badly, owing to a failure in the sap supply from below, then there is a tendency for the wood to produce fruit buds, and to harden to the extent of becoming stunted.

"Once a tree commences bearing fruit prematurely it is almost certain to remain in that productive state; and, as a consequence of this great strain on the constitution, little or no new growth is formed, and a badly-dwarfed tree is the result. No only are stunted trees of no practical value, but nothing short of drastic measures will ever improve them. We readily admit that many trees, planted under highly favourable conditions, have eventually grown into a serviceable size in spite of neglect as far as pruning is concerned, but they would have done better had they received proper attention at the outset. As it happens, however, these may be termed mere exceptions to the rule,

and one has only to tour through the fruit-growing districts in Wiltshire, Gloucestershire, Herefordshire, Worcestershire, Monmouthshire, Somerset, Dorset, and Devon to be convinced of the fact that millions of trees are not worth much more than they were when planted, any time, say, during the last ten years.

“If trees are planted in the autumn they ought to be

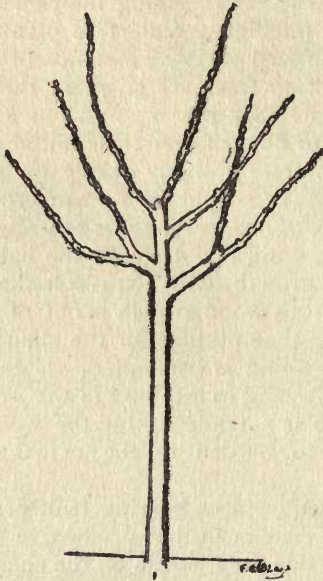


Fig. 138. A NEWLY-PLANTED STANDARD TREE.

Tree as received from the nursery and not pruned.

rather severely pruned the following February, or, if the weather is unfavourable, early in March, the only exception being made in favour of Cherries, which are found to respond to the knife better after having been planted not less than twelve months. As we have already pointed out, trees properly planted in the autumn partially recover from

the check, forming many root-fibres before top-growth commences in the spring, and these duly pruned form fairly large numbers of strong young shoots the following summer. Now, if the trees are not planted till late in the winter or early in the spring, they will not have made any appreciable move before the summer, and would not there-

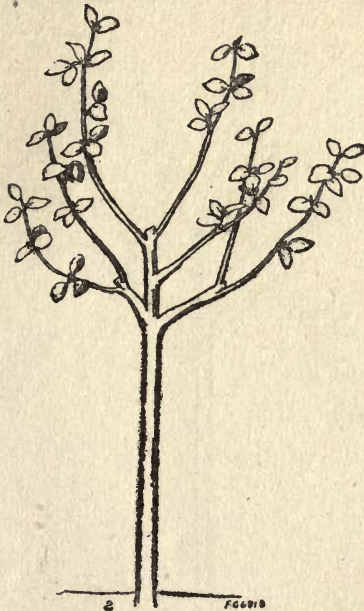


Fig. 139. STANDARD TREE AFTER ONE YEAR'S GROWTH.

As the result of non-pruning, the new growth is poor and stunted.

fore be in a condition to respond to the knife—might not make shoots more than 6in. long, in fact. These late-planted trees, then, ought to have an opportunity to form some new roots before they are pruned, and, in plain English, should not be pruned till they have been one year in their new, and presumably final, quarters.

“ Fig. 138 shows a standard tree much as received from a nursery, and this, unpruned, is repeated in Fig. 139, only furnished with all the leafy growth it is likely to form during the first summer. As it happens, those clusters of leaves represent so many fruit buds; and in Fig. 140 we have the same tree as it may be seen in full bearing the

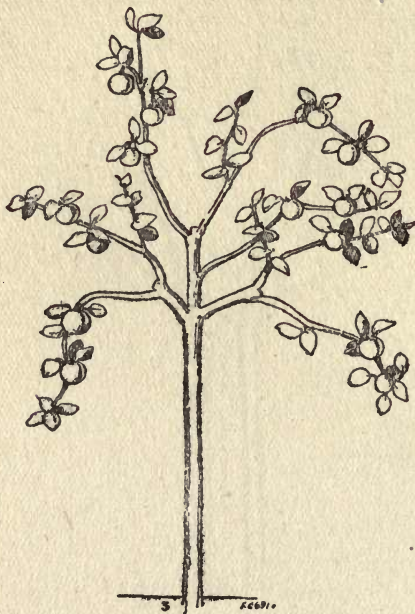


Fig. 140. STANDARD TREE AFTER TWO YEARS' GROWTH.

Showing the still further evil effects of non-pruning the first year. Result, a worthless tree.

second summer after planting. If, instead of allowing that tree to bear fruit, those branches had been duly cut back to where they are marked in Fig. 141, the resulting growth would have been more like that shown in Fig. 142, and of a character that would develop into a serviceable head. Let us repeat, stunted trees are a dead loss, and

must be guarded against by means of the pruning knife. If reference is again made to Fig. 141, the bars indicate where it is to be pruned in the spring following autumn planting. The result of this pruning is shown in Fig. 142, a satisfactory beginning, because the shoots, though not particularly strong, are sufficiently so, and of the right character for rapid progress in later years. (Fig. 143.)

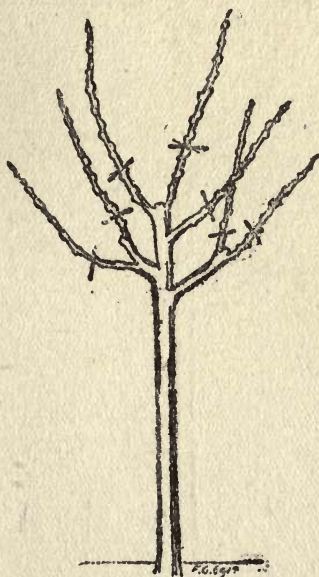


Fig. 141. A NEWLY-PLANTED STANDARD TREE.

Tree as received from nursery and properly pruned.

“ During the second winter after planting (or the third in the case of those not pruned till they have been planted one year) these shoots require to be thinned out where crowded, leaving all those best placed for developing in the right direction, open centres being aimed at in the

case of Apples and Cherries, and shortening these reserved shoots to about one-half of their original length. These pruned shoots will, in due course, push out other shoots, and if the variety is of a free-bearing habit of growth will also form a few fruit buds. A year later, thinning out

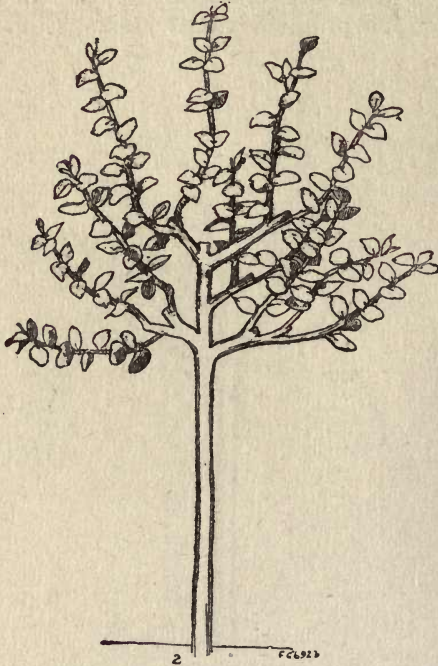


Fig. 142. STANDARD TREE AFTER ONE YEAR'S GROWTH.

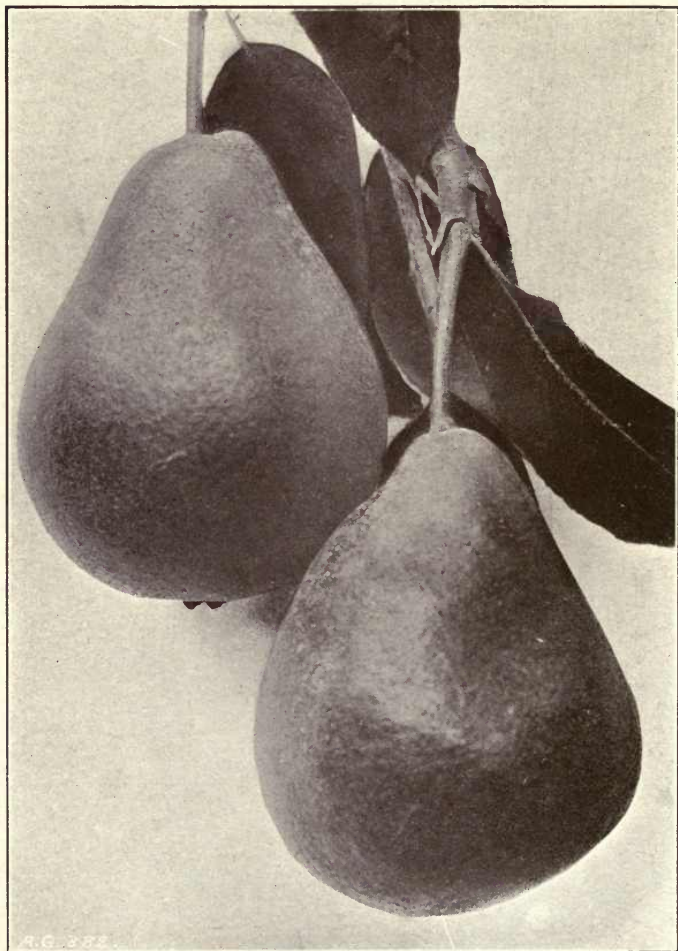
Result of pruning correctly at time of planting.

should again be resorted to, all the badly-placed shoots, including those with an inward tendency, and any rubbing against or crossing the shoots that are to be saved being shortened to within one inch of the old wood. The selected shoots may again be shortened this time, leaving



DESSERT PEAR, KNIGHT'S MONARCH.

Season : November to February.



DESSERT PEAR, BEURRE RANCE.
Season: December to March.

about two-thirds of their length, and more shoots and fruit buds will, during the following summer, form on these. In this way, a strong yet not too compact head will be formed, and all the pruning in later years may

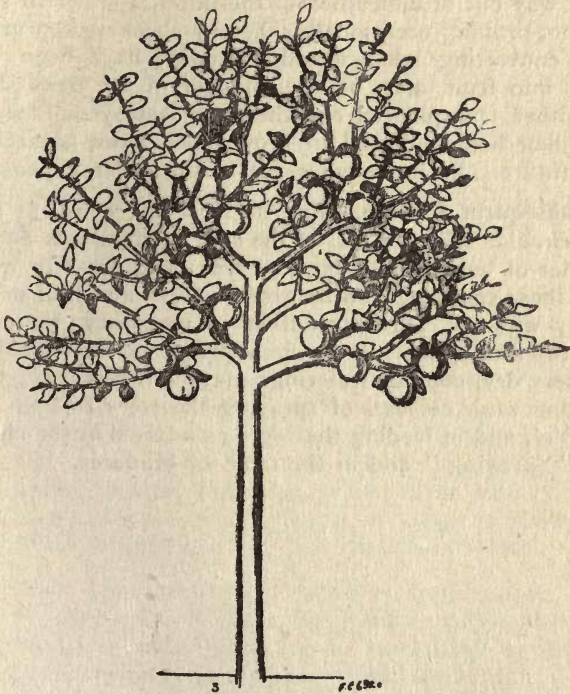


Fig. 143. STANDARD TREE AFTER TWO YEARS' GROWTH.

Result, a healthy, well shaped and fruitful tree.

consist of merely thinning out the branches where too thick or interfering with each other, and shortening back any with a tendency to take an undue lead.

“If the trees are planted so thickly as to require pruning annually to prevent undue crowding of shoots, the results,

as far as cropping is concerned, will be found anything but satisfactory; and an annual severe pruning, all the young growths being severely topped, means a plentiful supply of sticks every season, and not much fruit. The only way out of difficulties of this kind is either to resort to root-pruning occasionally, thereby checking top growth and converting what would otherwise have been wood buds into fruit buds, or else one-half of the trees should be either transplanted elsewhere or destroyed, those left standing being allowed to grow much more naturally in the future. Both remedies are of the order expensive."

Subsequent Culture.—For the first six years, at least, the circular space of 9ft. in the case of standards and 6ft. in that of bushes must be kept free from grass or weeds, and these spaces should be given a fresh mulch of manure every winter. This precaution is necessary to ensure healthy root action. If the first spring and summer should be very dry, copious waterings may be necessary. Other routine work consists of spraying the trees to keep them healthy, and in feeding the roots as advised in the chapter on "Spraying" and in the table of Manures.

CHAPTER II.

Fruit Plantation.

WHERE fruit is grown for sale, or where large quantities are wanted for home consumption, it becomes necessary to plant trees and bushes on a larger scale than is usual in the garden or home orchard. A few hints on the laying out of a plantation may therefore be useful to some readers.

Aspect.—There is little need to say much about aspect, for in most cases there is no choice in the matter. Usually the best has to be made of any land that may be available, and that it may generally be done successfully is shown by the fact that flourishing plantations may be found in many situations, on hills and on the level. However, there is no doubt that the ideal is a gentle slope towards the south or south-east, whilst south-west is permissible; but no one would choose a slope towards a northerly or easterly quarter, if it could be avoided.

Shelter is a very important factor in fruit culture, but it can be overdone. A sheltered position surrounded by higher land is generally found to be more liable to severe frost than more open or higher ground, the reason being that the cold air, being heavier than warm air, sinks into the lower position and remains there stagnant. It is by no means uncommon to find fruit bloom cut off by frost in the hollows whilst that on rising ground remains uninjured. On a gentle slope there is a certain amount of air movement or drainage, which is beneficial.

A good deal can be done to protect the trees on exposed land by planting shelter trees on the outskirts of the plantation, on the side from which the high winds are to be

expected; but such trees really need to be planted several years in advance of the fruit trees, to be large enough to protect the latter during the early stages of growth. Lombardy poplars are the most rapid growers that can be planted, but, if an evergreen is preferred, there is little to beat *Cupressus macrocarpa*, which grows fast and makes a dense shelter, whilst it also stands clipping if necessary. Austrian pines are often recommended as shelter, and are, no doubt, excellent in districts where they grow quickly, but we have found them too slow. Where only slight shelter is wanted, a double row of Damsons planted on the outside of the plantation itself is often enough. Forest trees should be separated from the fruit trees by the width of a headland or road, as their roots rob the fruit trees if put too close.

Soil.—About soil it is only necessary to say that, whilst a deep alluvial soil is naturally best, it is merely essential to avoid such extremes as stiff clays, dry sands and gravels, and very shallow land. Practically any land that will grow ordinary farm crops well can be made to grow fruit.

Preparations for Planting.—The preparation of the soil for planting in gardens and small orchards is fully treated in a previous chapter, but different methods are called for when we come to deal with areas too large to dig by hand. Drainage must, of course, be seen to where necessary, and some steps taken to break up the subsoil. Planting after ordinary shallow ploughing is a mistake. The best preparation is to allow a subsoil plough to follow the ordinary plough down each furrow; or the land may be broken up with a steam cultivator going twice over the field, and penetrating as near 2ft. deep as possible. If the land is foul, or has been under grass, it is best to take a crop of potatoes before planting fruit trees, as these are a good cleaning crop, and ensure the thorough working of the soil, besides which they are generously manured.

To mark the positions to be occupied by the trees, the

best plan is to let a good ploughman draw shallow furrows across the land in both directions, the distance between them being that required between the trees. A light double-breasted plough, such as is used for ridging, does the work well. Wherever the lines intersect a hole is dug for a tree, and further precautions are taken to keep the rows straight by sighting along them whilst actually planting, or when driving in the stakes if standard or half-standard trees are used—for these must be put in before planting. The sites for any bushes that are to go between the trees can be measured out afterwards by hand, using a garden line. It is very desirable to have the rows of both trees and bushes quite straight, so that horse cultivation can be done in two directions whilst the trees are young.

Distances Apart for Trees.—Some varieties of any kind of fruit are of much more spreading habit than others; so that, to make the most of all the available space, distances apart should really vary for different varieties. But this cannot be done where horse cultivation is to be employed, so we must be content to give all the same space. Of Apples, Pears, and Plums, full standards should be 20ft. to 24ft. apart each way; half-standards, 15ft. to 20ft.; and bushes (dwarf trees), 10ft. to 12ft. Cherries need to be 30ft. apart. Usually the larger distances are to be preferred, but the smaller ones are enough on very poor land, where the trees naturally do not spread so much. Some growers fill the space economically by alternating weak and strong-growing varieties; but we do not favour this, as it makes for confusion when gathering is in progress, besides which some kinds are more prone to certain pests and diseases than others, so that it is most convenient for all purposes to have the varieties separate in blocks. These blocks should not, however, be too large, as it has been found that some kinds are self-sterile, and need the pollen and other varieties to fertilise their bloom and enable it to set.

Bush fruits are usually grown between the tall trees, generally with the intention of grubbing them up when the trees grow so big as to overshadow them. They must, therefore, be placed at distances apart which are multiples of those of the trees. For instance, if the trees are 24ft. apart, there may be three bushes 6ft. apart between every two trees in the rows, and a row of bushes 6ft. apart midway between every two rows of trees. If the trees are at 20ft. distance, the bushes must be 5ft. apart, and so on.

As a rule, half-standard trees are best for market work, unless it be in the case of Plums, which are free-growing enough even on dwarfing stocks. Bush Apples on the English Paradise stock, excellent as they are for gardens or small orchards where the land can be generously enriched with manure, are not always free-growing enough for field planting, unless the soil is naturally rich. On poor land there is some danger of their becoming permanently stunted through too prolific fruiting in their early years. But they are very useful for planting between full standards, to fruit in the years that must elapse before the latter begin to be profitable, and to come out when the standards want all the room.

Examples of Plantations.—The arrangement of trees in a plantation can be varied in many ways to suit the special requirements of the grower, and we can only give a few examples as a guide. The most common plan is that of planting half-standard trees, say, 20ft. apart, with bushes (Currants or Gooseberries) 5ft. apart between them. There would be three bushes between each two trees in the rows, and a row of bushes only midway between every two rows of trees. The bushes give a quick return before the trees come into bearing, and are about worn out by the time the trees want all the room. (Figs. 144 and 145.)

On richer land bush-trained trees on a dwarfing stock could be planted instead of the half-standards, 12ft. apart each way, with bushes 6ft. apart between them.

A Cherry orchard may be started with standard Cherries



Fig. 144. A PLANTATION OF MIXED FRUITS.

C, Apple trees. D, Pear trees, E, Plum trees. F, Bush fruits.

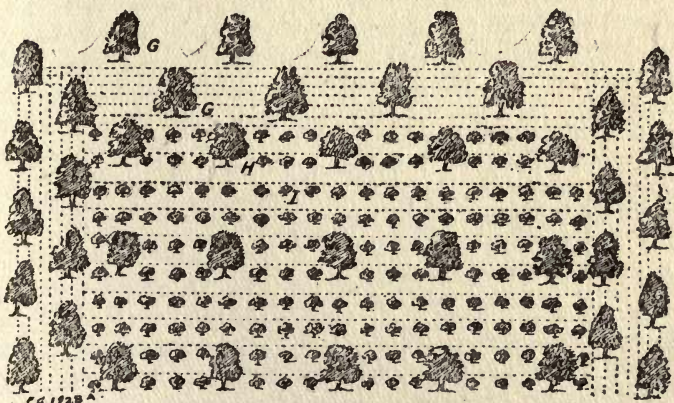


Fig. 145. A PLANTATION OF MIXED FRUITS.

G, Damsons as shelter trees. H, Apple and Plum trees alternately. I, Gooseberries and Currants. Strawberries under the Damson trees.

30ft. apart each way, and bush Plums or Apples 10ft. apart between them to stand until the Cherries want all the room. Apples are better for this purpose than Plums, because they bear earlier. Bush fruits also could be introduced into such an orchard.

Bush Apples or Plums can be planted in a similar way between full standard Apples or Pears 24ft. apart each way, the latter to stand alone when they want all the room, by which time they should be bearing well.

The above examples will suffice to show the ideas to be brought into play in arranging a plantation. The plans can easily be varied to include any kinds of fruit the grower wishes to plant. (Figs. 144 and 145.)

CHAPTER III.

Packing Fruit for Market.

IN no branch of commercial fruit-growing has more progress been made in recent years than in packing for market. Both home and foreign supplies of fruit have increased so enormously in our markets that competition is keen, and only really good produce, carefully graded and packed, can be expected to realise satisfactory prices. The days are long past when fruit could be knocked or shaken from the trees, poured anyhow into baskets, and sent to market with large and small specimens mixed together. Nowadays no profit would attend such a careless system. It cannot be denied that there is still a great deal of poor packing done, as a visit to any large market shows, but it will be found that the most successful growers give a great deal of attention to this branch of their work. Certainly it pays to do so. Even in a crowded market there is always room for the produce of a man who has become known amongst the regular buyers as one upon whom they can rely for careful and honest packing. Consistent good packing is bound to bring its reward. The buyers get to know that, when they see a certain grower's name on the label, the package can be relied upon to hold the full weight stated, and to contain the same quality at the bottom as at the top. There could hardly be a better example of the truth of the well-worn proverb—Honesty is the best policy.

Gathering for Market.—Care in gathering is the first necessity, for tasteful packing is of little use if the fruit has already been bruised and disfigured. Speaking generally, most kinds of fruit should be gathered before they are dead ripe, though by no means long before. It must

be remembered that several days often elapse before it reaches the consumer, so that it has time to become over-ripe or even partially rotten if too ripe when picked. Moreover, shopkeepers do not like to buy fruit that is likely to go bad on their hands before they can dispose of all of it. On the other hand, if gathered too early, the full flavour will not have developed by the time the fruit is consumed, and it is likely to shrivel.

But the chief point about gathering is to avoid bruising by rough handling. Pickers are apt to treat apples, for instance, as though they were potatoes, pouring them freely from one basket into another, instead of which they ought always to be transferred by hand.

It is generally advised that baskets padded with wood-wool or cotton-wool covered with canvas or tiffany, should be used for gathering; but it is doubtful if large growers ever go to this expense and trouble. They want such a lot of baskets in use at one time that they generally fall back on the bushel and half-bushel baskets received from the salesmen. The wooden baskets known as trugs, or bodes, in different parts of the country are also useful to pick into, but they would be very much the better for padding or a lining of felt. We have seen wooden trays or boxes made for sprouting seed potatoes employed for fruit picking. They are very suitable for the purpose, because they can be stood one on top of the other without injury to the fruit, owing to the ends being higher than the sides, and this is very convenient in both fruit room and carts. These could, of course, be lined with felt, though we have not found it necessary where the fruit was put into them with reasonable care.

The above remarks apply chiefly to Apples and Pears, which have to be removed from the field to the buildings for grading and packing. Most other kinds of fruit—unless it be choice Plums—can be gathered straight into the baskets in which they will be marketed, being graded at the same time where necessary, though many of the bush fruits need no grading.

Where the orchard consists of tall trees, steps are needed to reach the fruit on the top branches. The best form has wide steps at the bottom, and narrow ones at the top, where the sides approach till they meet. At this point a stout pole is hinged to act as a leg, forming a tripod with the two sides of the steps. We thus have steps which can be pushed up into the tree, and will yet stand alone without leaning against the branches. When the steps are in use, the picker needs to carry a small-handled basket aloft with him, emptying the contents into the larger baskets at intervals.

Grading.—The essence of good packing is careful grading, where the kind of fruit lends itself to the process. It may seem ridiculous that graded fruit should make better prices than the same produce in mixed sizes, particularly as the shopkeeper often mixes it again on his stall; but that such is the case can easily be proved by trial. Generally it is sufficient to make two grades—"firsts" and "seconds," but with some samples of fruit it is better to make a few "thirds" as well. Into this last grade can be put misshapen and marked fruits, leaving the "seconds" inferior to the "firsts" only in size. When this is done the "seconds" often realise almost as much money as the "firsts." With some fruits, as will be seen later, it pays to select some of the very choicest to pack in small non-returnable packages, in addition to the ordinary grades. The different grades should always be distinguished by the use of packing paper of separate colours, the various markets having recognised colours for "firsts," "seconds," etc.

Grading and packing are best done in a well-lighted shed, fitted with benches or tables of convenient height. The simplest plan is to have before one a basket just as it arrives from the field, take out the fruit as it comes, and grade and pack it at the same time—that is to say, the "firsts" are put into one package, the "seconds" into another, and so on. Or the finest fruits can be picked

out to fill a package with "firsts," and then the remainder packed as "seconds" and "thirds." The handiest method for the kind and quality of fruit being dealt with soon suggests itself, for there are no hard-and-fast rules. Some people advise turning the fruit out into felt-lined trays or divisions of the bench, grading in these, and then packing; but this plan seems to necessitate more handling than that described above.

The Packages.—Most of the fruit sent to market is packed in baskets supplied by the salesman, whose commission covers the initial cost and the wear and tear. Different salesmen do not send the same kind of basket for the various fruits, as customs are not alike in all markets. If the grower writes to the salesman to tell him what fruit he wishes to send, the proper sort of empties will be forwarded. The commonest baskets are bushels (sieves), half-bushels (half-sieves), pecks (quarter-sieves, or strikes), flats, and small-handled baskets. When dealing with a fresh market it is well to ask what weight is liked in each package, or whether they should be simply filled to the top.

Although most growers still rely on the salesman to supply empties for the greater part of their fruit, there has lately been a very popular move towards the use of small non-returnable packages for choice fruits, especially such kinds as are soft and perishable. The advantages for such purpose are obvious. The contents reach the consumer in much better condition, since they need not be disturbed or handled from the time they leave the grower. Big baskets of soft fruit are certain to get wet and messy from the very weight of the contents, and this state is made worse when the fruit is turned out in a heap in the shopkeeper's window. The small basket he exposes intact, and often the consumer purchases the whole thing and carries it home just as it left the grower's hands. The most popular kind of non-returnable for soft fruit is the chip-handled basket, which holds 4lb. of straw-

berries, and is suitable also for Raspberries, dessert Gooseberries, choice Plums, Greengages, etc. There is no reason why it should not be used also for very choice specimens of dessert Pears and Apples. For these fruits, however, some growers now use non-returnable wooden boxes, which certainly have the great advantage that the fruit is well protected from damage, and capable of being displayed with the greatest effect if tastefully packed. Colonial growers have led the way in the use of such boxes. They can be bought ready-made, or put together at home during the winter months. Such boxes are none too cheap, and should be used only for choice varieties and good samples. It is, however, usually possible to get the salesman to reduce his commission where non-returnables are used—as, indeed, he ought to, for he is relieved of the expense and worry of supplying empties.

The Actual Packing.—The essential point in the actual packing of large fruits is to make them so firm that they will not shake about and bruise, and yet not so tight as to damage them. At the same time, they should be so arranged as to present the best possible appearance, though “topping up” must be avoided. Let the packing be strictly honest, the fruit as good at the bottom as at the top. Generally the same weight is required in each package.

Little more can be said about packing in a general way. The best lesson is a visit to the market, and a chat with the salesman, who is always ready to explain what method of packing suits his trade best. The following hints on the packing of the principal fruits show the methods commonly followed:

Apples.—Dessert varieties usually go in half-sieves; cooking varieties in sieves. A little wood-wool or hay is put at the bottom, and round the sides a strip of “sugar-paper,” which can be obtained ready cut to size. Coloured or white tissue-paper, denoting the grade, is doubled over the edge of the basket, almost covering the bottom, and

leaving enough overlap to fold over the Apples at the top. Red, blue, and white may denote the three grades, though generally only two are made. Pack the Apples all the same way up, most kinds going best with the eye upwards. Fold the paper over the top when the full weight is in, place a layer of wood-wool or hay over, and secure with two "benders" of willow; or tie newspaper over the top. Label the outside of each basket, giving the salesman's name and address, the name of the variety, and the grade. Some growers also put a label inside bearing their own name and that of the variety. A half-sieve of Apples holds 20lb., a sieve 40lb.; but some salesmen merely want the baskets filled, and not weighed.

Packing in non-returnable boxes is now being recommended. These boxes are of various sizes, and the Apples are sold by count. The method of packing is practically the same as when baskets are used. Both sides and ends should be lined with paper, to fold over the fruit. Wood-wool is used, as before, at top and bottom, and the lid nailed on. There are also possibilities in the fancy packing of really fine specimens of choice dessert varieties in small boxes holding one or two dozen in a single layer, each fruit half-wrapped in white tissue-paper, and bedded in wood-wool.

Cherries.--The bulk are packed, without grading, in half-sieves, holding 24lb. No litter is wanted in the bottom. The best finish is a circular cover of "sugar-paper," sold to fit the baskets, with a layer of litter over, secured with "benders." Failing the circular papers, the baskets may be lined with tissue-paper, as for Apples. Some of the very finest Cherries are sometimes selected for packing in small chip baskets, or punnets, which in turn are packed in single layers in flat boxes.

Currants.--Pack ungraded in half-sieves holding 24lb., like Cherries, but the paper should be placed only over the top of the fruit. Lining the baskets excludes air, and the fruit does not keep well. Circular "sugar-papers"

are best over the top, but tissue-paper can be adopted, if tucked in slightly. Use no litter, but only "benders," over the paper. Choice White or Red Currants, fit for dessert, may sometimes go in 4lb. handled chip baskets or in punnets.

Gooseberries.—Pack the bulk in half-sieves of 24lb. in the same way as Currants, without lining the baskets or using any litter. Fine specimens of choice dessert varieties sometimes sell in punnets, or in 4lb. chip-handled baskets.

Peaches and Nectarines.—These choice fruits are sold by the dozen, and are packed in flat boxes holding from one to three dozen in a single layer. A layer of fine wood-wool is first placed in the bottom of the box, and over this a sheet of tissue-paper. This forms a soft bed for the fruit, each of which is half-wrapped in thin white tissue-paper, and pressed gently into position on the bed. Over the top another sheet of tissue-paper is laid, and on that a pad of cotton-wool, sold in sheets for the purpose, to fill the space between the fruit and the lid. Some growers use no paper at all, considering that it rots the Peaches. The lids are not nailed on, but several boxes are tied together in a pile for despatch by rail. We have also seen Peaches very tastefully packed in handled chip baskets.

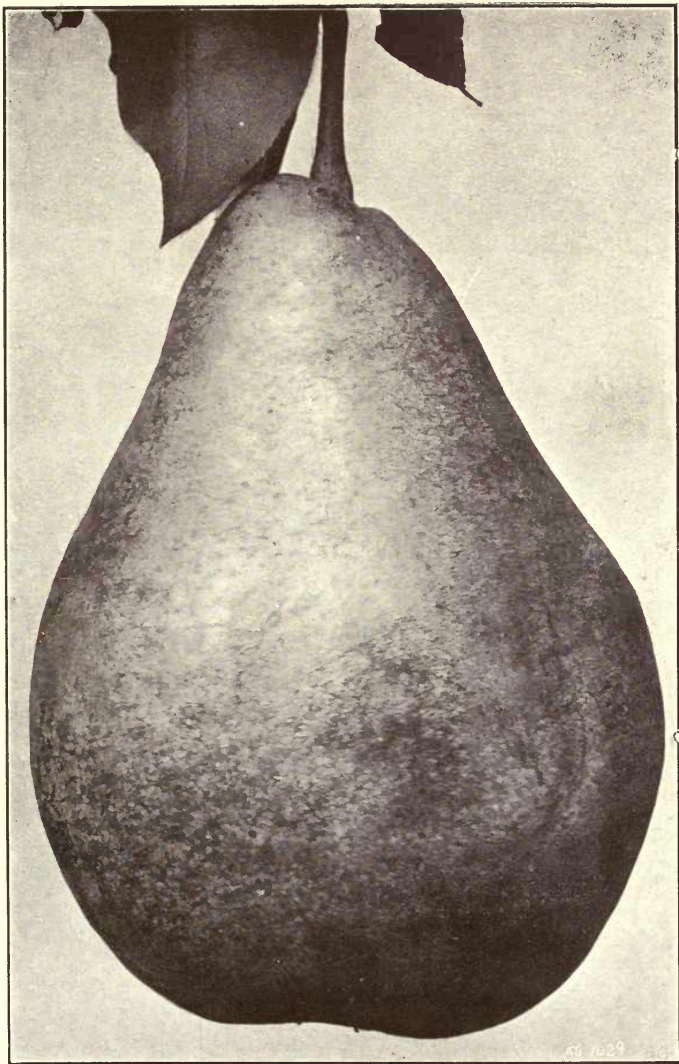
Pears.—Pack either in baskets or boxes in the same way as Apples. With choice varieties of these there is even more inducement to pack in small boxes of a dozen or so, tastefully half-wrapped in tissue-paper.

Plums.—These go in half-sieves of 24lb. to 28lb. No litter is placed in the bottom, but tissue-paper may be used, as for Apples, with "benders" over it (no litter). The circular "sugar-papers" mentioned for Gooseberries, etc., could be used instead, but would not show the grade, if any. Many crops of Plums are of too uniform a size to allow of grading, but some will make two

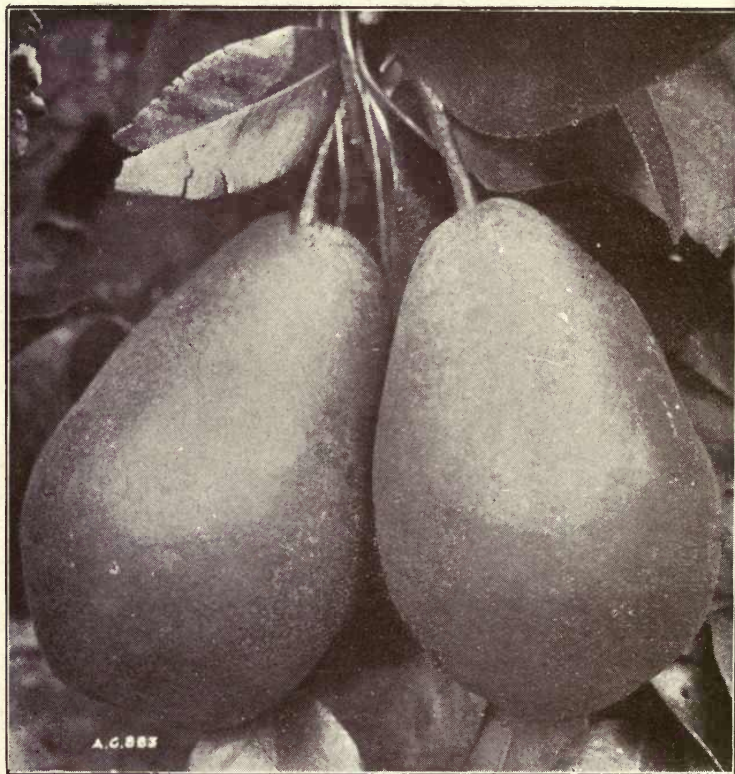
grades. Choice dessert Plums or Greengages may be packed in small boxes, in single layers, as described for Apples, but without wrapping each fruit in tissue-paper. They can lie close together on a bed of fine wood-wool covered with tissue-paper. Handled chip baskets are also used for choice Plums.

Raspberries.—For dessert these are usually gathered with about half an inch of stalk, and marketed in punnets, with a few leaves beneath them, or in 4lb. chip-handled baskets. The handiest punnets for packing are the square, deep ones, as they fit well into a flat box or into a case with shelves, and the fruit does not come above the edges. Make each layer of punnets very firm and secure, filling all corners with wood-wool or paper, and label "This side up." When Raspberries are marketed in bulk for cooking or jam, they usually go in small wooden barrels supplied by the jam-makers.

Strawberries.—Handled chip baskets holding 4lb. are now very largely used for choice Strawberries, but many come in strikes (quarter-sieves). The former are very much to be preferred, except for jam fruit. The earliest Strawberries are tastefully packed in shallow punnets, with a few leaves beneath and around them; and later on in deep, round and square punnets, holding about 1lb. For the packing of these, see Raspberries. The strikes are simply filled, and then have paper tied over the top.



DESSERT PEAR, GENERAL TODLEBEN.
Season: October and November.



A DESSERT PEAR, MARIE LOUISE.
Season: October and November.

CHAPTER IV.

Spraying Fruit Trees.

FRUIT TREES and bushes have so many enemies that the up-to-date fruit grower may be said to wage continual war against insect pests and fungoid diseases. At any rate, he has to be constantly on the watch for the first sign of attack, and ever ready to meet it with the most effective weapon with which modern science can supply him. Fortunately he is much better equipped for the fray nowadays than he could be even a few years ago, for keen brains and skilful hands have been at work to learn the life histories of the pests and diseases, to discover spraying fluids calculated to destroy them with the minimum of injury to the trees, and to devise cheap and efficient machinery for the application of such remedies. It must be confessed that there are still some troubles for which the pruning-knife and the fire are the only remedies, but for the great majority spraying with suitable materials provides a cure or preventive.

A Necessary Evil.—Spraying is the great modern weapon against orchard pests and diseases. It may be looked upon with disfavour, for it is often unpleasant work, and expensive and laborious where large areas have to be dealt with; but at least it is a necessary evil, for without its aid it is impossible to grow healthy crops. Naturally it assumes greatest importance where fruit is grown on a commercial scale, for competition is nowadays so keen that only first-class fruit is really profitable, and trees and bushes under field cultivation seem to be more liable to insect and fungoid attacks than those grown in the more congenial atmosphere of a well-tilled garden. Indeed, the market grower has come to consider spraying

as part of his ordinary routine work; and the amateur with anything worth calling an orchard under his care must follow suit if he wishes his trees and his fruit to be a credit to his skill. No one wants to spray more than is absolutely necessary; the desire should rather be to reduce the work to the minimum that suffices to keep the trees healthy; but the grower is lucky when he escapes spraying two or three times in the year; and in a bad season, or when his trees are severely attacked by any particular enemy, he may have to treat them several times in addition. The great thing is to take an attack in time, for it is much more easily dealt with in its early stages than after it has become firmly established. Take an attack of Leaf-curling Aphis (greenfly), for instance, with which the fruit grower has to contend nearly every year. Once the pests have curled themselves up in the leaves they are practically safe, because no spray can reach them. It is only by catching them when they first appear, before they protect themselves in the way described, that they can be dealt with successfully. The grower should be amongst his trees constantly in the spring and early summer, from the time when the first buds burst, so that he may detect the coming of the queen Aphides, the Apple Sucker (psylla), many minute caterpillars, and other pests that make their appearance on the young leaves and amongst the bloom buds. At that time they are comparatively easily dealt with, but if neglected they increase with wonderful rapidity, particularly in a cold season, when vegetation is slow to develop, and before long they become a formidable host, difficult to combat with any degree of satisfaction.

The Year's Spraying Simplified.—A beginner making his first study of a text-book of pests and diseases might well imagine, from the multitude of enemies and the number of different remedies advised, that his spraying operations must be almost endless, and his store of chemicals enough to stock a chemist's shop. Fortu-

nately, however, it is possible to combat many pests and diseases in one operation. Roughly, the enemies of fruit trees and bushes may be divided into three classes, as follows:

- (i) Leaf-biting insects, such as the various caterpillars.
- (ii) Pests which live by sucking the plant's juices, such as the various aphides, psylla, etc.
- (iii) Fungoid diseases, such as Apple Scab, Brown Rot, etc.

Each of these three classes requires special treatment, but by the use of combined washes or spray-fluids any two or all three of them may be dealt with in one operation.

The leaf-biting insects of the first class are destroyed by poisoning their food. This may be done by spraying with arsenate of lead.

The sucking pests of the second class cannot be killed by poisoning their food, because they pierce to the inner tissues of the plant to obtain the juices on which they live. They have to be destroyed by washes which either block up their breathing pores (such as paraffin and soft soap emulsion), or those that act directly on their skins (such as nicotine or tobacco extract).

The fungoid diseases, of the third class, are not touched by the insecticides mentioned above. Against them we have to use fungicides such as Bordeaux mixture or lime-and-sulphur.

Suppose we agree to employ arsenate of lead for the leaf-biters, nicotine for the sucking pests, and Bordeaux mixture for the fungoid diseases. We may thus be very simply equipped against practically all our enemies. The arsenate and Bordeaux mixture may both be obtained in the form of paste, and the mixture in the form of extract. Any of these may be used alone, and any two or all three may be combined, as required. With the quantities to use we will deal later. Practically all we shall need in

addition is a winter wash to clear the trees of moss and lichen.

There are, of course, other washes which do the same work, including numerous excellent proprietary preparations. It is also possible to use cheaper materials for some purposes. We have merely suggested the above materials because they seem to reduce the whole subject of spraying to the simplest possible dimensions, at the same time being some of the most modern and effective remedies.

We will now consider the use of these materials, and some others, in the spraying operations required in an average season.

Winter Spraying.—This has to be done whilst the trees are dormant, and may take place at any time from the fall of the leaves in autumn to the first signs of the bursting of the buds in spring. It is, however, found to be most effective when done in February, or up to the first part of March, for at that time the trees are still dormant, but the insect pests are beginning to awaken into life, and are more vulnerable in consequence. February is probably the safest month.

The chief object is to remove moss, lichen, and loose bark. A tree cannot long remain healthy if covered with such growths, which in time sap its energy and cause it to produce small and worthless fruit. Worse than this, moss and lichen harbour pests and diseases. Some of the hibernating insects, notably American Blight (woolly aphis), are certainly killed, as are the eggs of some other pests. It is hoped that fungoid disease spores also are destroyed, although this is doubtful. But the chief thing is that the trees are cleaned of encumbrances that would harbour pests and diseases in future. Growers find that winter spraying gives them cleaner crops, but it is not wise to expect too much from it, and to think that it

obviates the need of spring and summer work. This operation is not needed every winter; it is enough if it be well done every two or three years.

The mere removal of lichen and moss from old trees can be effected by spraying with a very simple wash—viz., 2½lb. of caustic soda (98 per cent. purity) dissolved in 10 gallons of water. But a better wash for general winter spraying is what is known as the Woburn wash, the outcome of the investigations of Mr. Spencer U. Pickering at the Woburn Experimental Fruit Farm. The ingredients are as follows: Iron sulphate, ½lb.; quicklime, ¼lb.; paraffin, 5 pints; water, 9½ gallons; caustic soda, 2lb. To prepare the wash, the iron sulphate is dissolved in about 9 gallons of water. The lime is then slaked in a little water and well stirred, a little more water being added to make a "milk." The milk of lime is next run into the iron sulphate solution through a piece of sacking or a fine sieve, to remove grit or coarse particles. The paraffin is then added, and the mixture churned thoroughly with the spraying syringe, repeatedly drawing some up and forcibly ejecting it into the rest of the solution until a complete emulsion is obtained. Just before using, the caustic soda in the powdered form is added to complete the wash.

Another winter wash that can be recommended is the lime-and-sulphur. Not only is it both an insecticide and a fungicide, but it also checks birds from eating fruit buds if used shortly before they open. Lime-sulphur is cheap, and can be bought in concentrated liquid form from several makers (sometimes under fancy names), requiring only to be diluted with water. Note that the makers give directions for mixing both for winter and summer use. For the former three quarts to ten gallons of water is commonly recommended, but the maker's instructions should be followed. We have tried the "self-boiled" formula often given, and have made and used hundreds of gallons of home-boiled wash made in an iron "copper," but we have no hesitation in advising the purchase of the factory-boiled concentrated solution, for it is strongest

and best. This excellent wash, however, must not be applied by means of a copper spraying machine, or with one containing copper parts, because the lime-sulphur chemicals react with copper, and hence seriously injures the machine. If, however, the machine be made of tinned copper or some other resistant alloy, then it may be safely used for lime-sulphur washes.

Spring Spraying.—As soon as any foliage or bloom appears on fruit trees, insect pests appear. At this time the grower should be frequently amongst his trees with a magnifying glass to detect his enemies. Amongst the first to appear on all trees are the mother-queen Aphides, which, although thinly scattered, breed with remarkable rapidity, and soon produce a serious attack. Various minute caterpillars arrive almost as soon, and the Apple Sucker is to be found amongst the bloom buds of Apple trees before they open. The spring spraying is directed against these pests, and also against fungoid diseases, particularly Apple and Pear Scab, and Brown Rot on Plums, Apples, and Pears. As soon as the bloom has fallen, Apple trees often need spraying again to kill Codlin Moth caterpillars and the larvæ of the Apple Saw-fly, both of which bore into the fruit and cause the familiar maggoty Apples.

The materials to use are arsenate of lead for caterpillars; tobacco extract or nicotine for sucking pests like Aphides, Apple Sucker, and Red Spider; and Bordeaux mixture for fungoid diseases. The arsenate should be obtained in the form of paste, of which 4lb. is used in 100 gallons of water. The tobacco extract is used at the rate of 10lb. per 100 gallons of water. Bordeaux mixture can now be obtained in the form of paste, made from the Woburn recipe, and this is generally accepted as better than home-made mixtures, because less liable to scorch the foliage, and moreover keeps well. It is used at the rate of 8lb. in 100 gallons of water, or 6lb. when the foliage is young and tender.

Spraying should be done just before the bloom buds

open, and again just after the petals fall, never whilst the bloom is actually open. Any of the above washes can be used alone, or any two combined, or all three together, according to the enemies present. Suppose spraying is being done against Aphides, young caterpillars, and fungoid disease, the combined wash would be as follows: Tobacco extract, 10lb.; arsenate of lead paste, 4lb.; Woburn Bordeaux paste, 6lb. to 8lb.; water, 100 gallons. If no caterpillars are present at the first spraying, omit the arsenate of lead; if no Aphides, omit the tobacco, etc. When the spraying is only for fungoid diseases, Bordeaux mixture is used alone. The grower can only tell from his previous year's experience whether he needs to spray against fungoid diseases, such as Scab and Brown Rot, as it is done as a preventive rather than a remedy.

Summer Spraying.—In a good season the grower may find no further spraying necessary. If, however, he is fighting Apple or Pear Scab, he is certain to want one more spraying with Bordeaux mixture two or three weeks after the second. He can then add the other ingredients if required for insect pests at the same time.

Again, some seasons prove very bad for Aphis attack, and repeated sprayings of tobacco wash may be necessary. It is very important to take this pest early, particularly the leaf-curling species, as once these are curled up in the leaves they cannot be reached, and little good results from spraying. Large growers sometimes find the tobacco wash too expensive, although there is nothing better. For them we can recommend the following from experience: Quassia chips, 10lb.; soft soap, 10lb.; water, 100 gallons. Boil the quassia with half the soap and some water for an hour; then with the rest of the soap and some more water for another hour. Finally mix the two solutions, and make up to 100 gallons with water. This wash may be substituted for tobacco in any of the combined washes already recommended.

Some Warnings.—Few growers need advising not to do more spraying than is found necessary. If any of the applications recommended can be done without in a good season, by all means let them be omitted. This may often happen in gardens, though seldom in the market plantation. Too much spraying does not do the trees any good; and with Bordeaux mixture in particular there is danger of scorching the foliage, some varieties (Cox's Orange Pippin, for instance) being much more liable to damage than others.

In the absence of chemical knowledge it is safer to buy the prepared washes.

Another necessary warning is that arsenate of lead is very poisonous, and should not be used on fruit near the time of gathering for use.

In the case of winter washes containing caustic soda, it should be remembered that they burn the skin of the face and hands. Vaseline on the face, and hedging gloves on the hands are sufficient protection.

Hints on Spraying.—The main point in spraying is to cover all parts of the tree or bush with a fine, mist-like spray, without drenching it. Never should it be so much soaked that the wash drips off the points of the leaves. This is where there is most danger of scorching. From this it will be gathered that the spraying nozzle is very important. An ordinary garden syringe, with its comparatively coarse rose, is of no use at all; but there are syringes made with proper nozzles that do the work quite well in a small garden, or even a large one. The spray must be delivered in a regular cloud which is easily carried on the wind. For washes containing lime special nozzles are required.

For use in larger gardens and on the fruit farm there are many spraying machines, made in all sizes. The various knapsack machines, which are carried on the back, will be found very handy, even where the work to be done is extensive; though much more powerful

machines are, of course, in use. The best knapsack machines are those in which the spray is forced out by compressed air, the machine being charged with air before spraying starts. The operator then has nothing to do but to direct the spray when he gets amongst the trees, having no pumping to occupy his attention. For tall trees the nozzle has to be mounted on a long lance.

Addenda.

American Blight.—In dealing with this pest on p. 268 only a brief reference was made to its also infesting the roots. It appears that the lice migrate from the branches to the roots, and cause galls to form thereon. It has also been proved that the lice migrate from the roots to the branches. It is impossible, therefore, to get wholly rid of the aphid if the branch or aerial form only is dealt with, hence it is essential to also apply remedies to destroy the root progeny. This may be accomplished in two ways. Thus, carbon disulphide, a highly volatile substance, should be injected into the soil by means of a Vermoral Injector in about four places, at a distance of 2ft. from the trunk in winter. The operator must not smoke whilst injecting the fluid as the disulphide is inflammable. The second method, which is less dangerous and more simple to use, is to place some lumps of freshly burnt lime in a ring around the base of the trunk. When these have slaked, spread out the lime 2in. deep and 1ft. wide closely around the trunk, and then cover it with a layer of soil. The lime prevents the lice ascending or descending, and as they cannot multiply on the roots, only above ground, those below will eventually die.

Another good remedy for eradicating American Blight on the branches is to dissolve 4oz. of soft soap in a gallon of boiling soft water, then add one fluid ounce of carbolic acid and thoroughly mix the whole. Apply this when cold by means of a stiff painter's brush to the infested parts only. Use gloves to protect the hands from the acid.

MARKET FRUITS.

APPLES (COOKING).

List of profitable sorts, with season of ripening, when and how to market, average pre-war prices, etc.

Name of Variety.	Season.	When to Sell.	How best Sold.	Average Prices.	How best Grown.
Alfriston	Nov., Mar.	Jan., Feb.	Bush.	4/6 5/6	Dwf. or St.
Annie Elizabeth ...	Dec., Apr.	Mar., Apr	Bush.	4/6 5/6	Dwf. or St.
Bismarck	Oct., Jan.	Dec., Jan.	Bush.	2/6 5/-	Standard.
Blenheim Orange ...	Nov., Feb.	Dec. ...	Bush.	6/6 8/-	Standard.
Bramley's Seedling	Dec., Apr.	Jan., Feb	Bush.	5/- 6/-	Dwf. or St.
Cox's Pomona	Oct., Nov.	Nov. ...	Bush.	4/- 6/-	Dwf. or St.
Early Victoria ...	July, Aug.	July ...	Bush.	2/6 5/-	Dwarf.
Ecklinville Seedling	Sept., Oct.	Sept. ...	Bush.	2/6 5/-	Dwf. or St.
Edward VII.	Jan., Apr.	Feb., Mar.	Bush.	5/- 6/-	Dwf. or St.
Golden Noble	Nov., Dec.	Dec. ...	Bush.	3/- 5/-	Dwf. or St.
Golden Spire	Oct., Dec.	Nov. ...	Bush.	2/6 5/-	Dwf. or St.
Grenadier	Sept., Oct	Sept. ...	Bush.	3/- 5/-	Dwf. or St.
Keswick Codling ...	Aug., Sep.	Aug. ...	Bush.	1/6 2/6	Standard.
Lane's Prince Albert	Nov., Apr.	Dec., Feb.	Bush.	4/- 6/-	Dwf. or St.
Lord Derby... ..	Nov., Dec.	Nov. ..	Bush.	4/- 6/-	Dwf. St.
Lord Suffield	Aug., Sep.	Aug. ..	Bush.	1/6 4/-	Dwf. St.
Newton Wonder ...	Nov., May	Jan., Apr.	Bush.	4/6 7/-	Dwf. St.
Norfolk Beauty ...	Oct., Dec.	Nov. ...	Bush.	4/6 6/-	Dwf. or St.
Peasgood's Nonsuch	Nov., Dec.	Nov. ...	Bush.	5/- 8/-	Dwf. St.
Royal Jubilee	Oct., Mar.	Jan., Feb.	Bush.	4/- 8/-	Dwf. St.
Stirling Castle ...	Oct., Nov.	Oct. ...	Bush.	2/6 4/6	Dwf. St.
Tower of Glamis ...	Oct., Nov.	Oct. ...	Bush.	2/- 4/-	Standard.
Warner's King	Nov. ...	Nov. ...	Bush.	5/- 6/-	Dwf. St.
Wellington... ..	Nov., Mar.	Dec., Feb.	Bush.	4/- 6/6	Dwf. St.

APPLES (DESSERT).

List of profitable sorts, with seasoning of ripening, how and when to market, average pre-war prices, how best grown, etc.

Name of Variety.	Season.	When to Sell.	How best Sold.	Average Prices.	How best Grown.
Allington Pippin ...	Nov., Feb.	Dec., Jan	Bush.	10/-16/-	Dwarf.
Beauty of Bath	July, Aug.	July ...	Bush.	3/6 5/-	Dwarf.
Christmas Pearmain	Nov., Dec.	Dec. ...	Bush.	6/-10/-	Dwarf.
Cox's Orange Pippin	Nov., Jan.	Dec. ...	Bush.	10/-16/-	Dwf. or St.
DevonshireQuarrdn.	Aug. ...	Aug. ...	Bush.	3/6 5/	Standard.
Duchess' Favourite	Sept., Oct	Sept. ...	Bush.	3/6 5/-	Dwf. or St.
Gascoigne's Scarlet	Nov., Feb.	Dec., Jan.	Bush.	4/- 6/-	Dwf. or St.
Duchess of Oldnbgh.	Aug., Sep.	Aug. ...	Bush.	3/6 5/-	Dwarf.
Juneating, Red	Aug. ...	Aug. ...	Bush.	3/6 5/-	Dwf. or St.
King of Pippins ...	Oct., Jan.	Dec. ...	Bush.	4/- 7/-	Dwf. or St.
Lady Sudeley.....	Aug., Sep.	Aug. ...	Bush.	3/6 5/-	Dwf. or St.
Ingestre, Yellow ...	Sept. ...	Sept. ...	Bush.	3/6 6/-	Dwf. or St.
Mr Gladstone	July, Aug.	July ...	Bush.	3/- 5/-	Dwf. or St.
Ross Nonpariel	Nov., Dec.	Dec. ...	Bush.	5/6 7/-	Dwf. or St.
Sturmer Pippin	Feb., June	Jan., Mar.	Bush.	6/6 8/-	Dwf. or St.
Worcester Pearmain	Sept. ...	Sept. ...	Bush.	3/- 7/-	Dwf. or St.
Rosemary Russet ...	Dec., Feb.	Jan. ...	Bush.	4/- 8/-	Standard.
Allen's Everlasting	Apr., May	Mar., Ap.	Bush.	5/- 7/-	Standard.
James Grieve.....	Sept., Oct.	Sept. ...	Bush.	6/- 8/-	Dwf. or St.
Duke of Devonshire	Mar., Ap.	April ...	Bush.	5/- 6/-	Dwf. or St.
Ellison's Orange.....	Oct.	Oct. ...	Bush.	5/- 6/-	Dwf. or St.
Lord Burghley	Feb., Mar.	Feb. ...	Bush.	6/- 7/-	Dwf. or St.
Lord Hindlip.....	Jan., May	Mar., Ap.	Bush.	6/- 7/-	Dwt. or St.
Ribston	Nov., Jan.	Dec. ...	Bush.	10/-16/-	Dwf. or St.

CHERRIES.

List of profitable sorts, with modes of marketing ; average pre-war prices, best form of trees, etc.

Variety.	Class.	Season	How Sold.	Average Prices.	How Grown.
Archduke ...	Duke ...	July	½ sieve	4/- 5/-	Standard.
Black Heart ...	Black Heart	July	½ sieve	4/- 5/-	Standard.
Black Eagle ...	Black Heart	July	½ sieve	4/- 5/-	Standard.
Cluster, Black...	Black Heart	Aug.	½ sieve	7/- 15/-	Standard.
Elton ...	White Heart	July	½ sieve	4/- 8/-	Standard.
Bigarreau (Napoleon)	White Heart	Aug.	½ sieve	7/- 15/-	Standard.
Bigarreau (Kent)	White Heart	Aug.	½ sieve	7/- 15/-	Standard.

CHERRIES—continued.

Variety.	Class.	Season	How Sold.	Average Prices.	How Grown.
Governor Wood	White Heart	July	$\frac{1}{2}$ sieve	4/- 8/	Standard.
Black Tartarian	Black Heart	June	$\frac{1}{2}$ sieve	4/- 8/-	Standard.
May Duke ..	Duke ...	June	$\frac{1}{2}$ sieve	3/- 5/-	Standard.
Late Duke ...	Duke ...	Aug.	$\frac{1}{2}$ sieve	7/- 15/-	Standard.
Rivers' Early ...	Black Heart	June	$\frac{1}{2}$ sieve	4 - 8/-	Standard.
Waterloo ...	Black Heart	June	$\frac{1}{2}$ sieve	4/- 8/-	Standard.
Royal Duke ...	Duke ...	July	$\frac{1}{2}$ sieve	4/- 8/-	Standard.
Frogmore					
Bigarreau	White Heart	June	$\frac{1}{2}$ sieve	4/- 8/-	Standard.
Kentish Red ...	Cooking ...	July	$\frac{1}{2}$ sieve	3/- 5/-	Dwfs. & St.
Flemish Red ...	Cooking ...	July	$\frac{1}{2}$ sieve	3/- 5/-	Dwfs. & St.
Morello ...	Cooking ...	Aug.	$\frac{1}{2}$ sieve	4/- 8/-	Dwfs. & St.

CURRANTS.

List of the most profitable sorts, with modes of marketing, and average pre-war prices.

Variety.	Colour.	How Marketed.	Average Prices.	Adaptability.
American Wonder	Red ...	$\frac{1}{2}$ sieve	4/- 7/-	Cook ; preserving.
Baldwin's ...	Black ...	$\frac{1}{2}$ sieve	4/- 6/-	Cook ; preserving.
Black Naples ...	Black ...	$\frac{1}{2}$ sieve	4/- 6/-	Cook ; preserving.
Boskoop ...	Black ...	$\frac{1}{2}$ sieve	4/- 6/-	Cook ; preserving.
Carter's Champion	Black ...	$\frac{1}{2}$ sieve	4/- 6/-	Cook ; preserving.
Fay's Prolific ...	Red ...	$\frac{1}{2}$ sieve	3/6 6/	Cook ; preserving.
Raby Castle ...	Red ...	$\frac{1}{2}$ sieve	5/- 7/-	Cook ; preserving.
New Red Dutch ...	Crimson	$\frac{1}{2}$ sieve	4/- 7/-	Cook ; preserving.
Scotch Red ...	Red ...	$\frac{1}{2}$ sieve	4/- 7/-	Cook ; preserving.
Versailles ...	White...	Punnet.	— —	Dessert.
White Dutch ...	White...	Punnet.	— —	Dessert.

DAMSONS AND BULLACES.

Variety.	Season.	How to Market.	Average Prices.	How Grown.
Farleigh Prolific ...	Sept.	$\frac{1}{2}$ sieve	3/6 4/6	Standard.
Frogmore ...	Sept.	$\frac{1}{2}$ sieve	3/6 4/6	Standard.
Shropshire ...	Sept.	$\frac{1}{2}$ sieve	3/- 3/6	Standard.
Bradley's King... ..	Sept.	$\frac{1}{2}$ sieve	3/- 4/-	Standard.
Shepherd's Bullace ...	Sept.	$\frac{1}{2}$ sieve	2/6 3/6	Standard.
Merryweather ...	Sept.	$\frac{1}{2}$ sieve	2/6 3/6	Standard.

FILBERTS AND COBNUTS.

Select list of profitable sorts, with periods to market, and average pre-war prices ; also marketed by the pound and twelve pounds, as well as by the sieve.

Variety.	When to Market.	How to Market.	Average Prices.
Cosford	Sept. to Feb.	Sieve	4/- to 5/- per 12 lbs.
Kentish Cob	Sept. to Feb.	Sieve	4/- to 5/- per 12 lbs.
Kent Filbert	Sept. to Feb.	Sieve	4d. to 6d. per lb.
Prolific Frizzled Filbert	Sept. to Feb.	Sieve	4d. to 6d. per lb.
Pearson s Prolific Cob...	Sept. to Feb.	Sieve	4/- to 5/- per 12 lbs.

GOOSEBERRIES.

List of profitable sorts, with methods and periods of marketing, average pre-war prices, and adaptabilities.

Variety.	Colour.	When to Market.	How to Market.	Average Prices.	Adaptability.
Crown Bob	Red ...	Green	½ sieve	6/- 8/-	Cooking.
Early Sulphur	Yellow	Ripe ...	½ sieve	4/6 6/6	Dessert.
Keepsake (Berry's)...	Green	Green	½ sieve	6/- 8/-	Cooking.
Lancashire Lad	Red ...	Green	½ sieve	6/- 8/-	Cooking.
Alma	White	Ripe ...	Punnet	— —	Dessert.
High Sheriff	Yellow	Ripe ...	Punnet	— —	Dessert.
Large Whitesmith	White	Green	½ sieve	6/- 8/-	Cooking.
Warrington	Red ...	Green or Ripe	½ sieve	1/3 6/-	Cook ; pre- serving.
Whinham's Industry	Red ...	Green or Ripe	½ sieve	1/3 6/-	Cook ; pre- serving.
Rifleman	Red ...	Green	½ sieve	6/- 8/-	Cooking.
Telegraph	Green	Ripe ...	Punnet	— —	Dessert.
Leveller	Yellow	Ripe ...	Punnet	— —	Dessert.
Speedwell	Red ...	Ripe ...	Punnet	— —	Dessert.

PEARS (DESSERT).

List of profitable sorts, with season of ripening, how and when to market, average pre-war prices, etc.

Variety.	Season.	When to Market.	How to Market.	Average Prices.	How best Grown.
Beurré d'Amanlis ...	Sept. ..	Sept.	Bush.	5/- 6/-	Dwf. St.
Beurré Bosc ...	Nov. ..	Nov.	Bush.	5/- 7/-	Dwarf.
Beurré Capiaumont ...	Oct. .	Oct.	Bush.	5/- 6/-	Standard.
Beurré Clairgeau ...	Oct. ..	Oct.	Bush.	5/- 7/-	Dwf. St.
Chalk ...	Aug. ..	Aug.	Bush.	2/6 6/-	Standard.
Conference ...	Oct. ..	Oct.	Bush.	2/6 5/-	Dwf. St.
Doyenné Boussoch ...	Oct. ..	Oct.	Bush.	5/- 7/-	Dwf. St.
Doyenné du Comice ...	Nov., Jan	Dec.	Bush.	5/- 7/-	Dwf. St.
Doyenné, Summer ...	Aug. ...	Aug.	Bush.	2/6 6/-	Dwf. St.
Thompson ...	Oct., Nov	Oct.	Bush.	5/- 6/-	Dwarf.
Dr. Jules Guyot ...	Sept. ...	Sept.	Bush.	5/- 6/-	Standard.
Durondeau ...	Oct. ...	Oct.	Bush.	5/- 7/-	Dwf. St.
Emile d'Heyst ...	Oct., Nov.	Oct.	Bush.	5/- 7/-	Dwarf.
Fertility ...	Oct. ...	Oct.	Bush.	2/6 5/-	Standard.
Jargonelle ...	Aug. ...	Aug.	Bush.	3/6 6/6	Standard.
Eyewood ...	Oct. ...	Oct.	Bush.	2/6 5/-	Standard.
Marie Louise d'Uccle ...	Nov. ...	Nov.	Bush.	3/6 8/-	Dwt. St.
Pitmaston Duchess ...	Oct. ...	Oct.	Bush.	4/- 9/-	Dwf. St.
Princess ...	Oct. ...	Oct.	Bush.	3/6 5/-	Dwf. St.
Souvenir du Congrès ...	Sept. ...	Sept.	Bush.	5/- 7/-	Dwarf.
Williams' Bon Chretien	Sept. ...	Sept.	Bush.	2/6 5/-	Standard.
Hessle ...	Sept. ...	Sept.	Bush.	2/6 5/-	Standard.
Lammas ...	Aug. ...	Aug.	Bush.	2/- 3/6	Standard.
Louise Bonne of Jersey	Oct. ...	Oct.	Bush.	5/- 6/-	Dwf. St.

PLUMS (DESSERT).

List of profitable sorts, with season, colour, mode of marketing, average pre-war prices, etc.

Variety.	Season	Colour.	How Sold.	Average Prices.	How Grown.	Soil.
Belgian Purple ...	Sept.	Violet	$\frac{1}{2}$ sieve	2/- 7/-	Dwf. St.	Ord.
Denniston's Superb ...	Aug.	Yellow	$\frac{1}{2}$ sieve	4- 7/-	Standard.	
Heron ...	Aug.	Red ...	$\frac{1}{2}$ sieve	2/- 7/-	Dwf. St.	Ord.
Greengage (old) ...	Aug.	Green	$\frac{1}{2}$ sieve	3/6 7/-	Dwf. St.	Light.
Jefferson's Gage ...	Sept.	Yellow	$\frac{1}{2}$ sieve	3/6 7/-	Dwf. St.	Light.
Transparent Gage (late)	Sept.	Red ...	$\frac{1}{2}$ sieve	3/6 7/-	Dwf. St.	Light.
Oullin's Golden Gage ...	Aug.	Yellow	$\frac{1}{2}$ sieve	3/6 7/-	Dwf. St.	Light.
Coe's Golden Drop ...	Oct.	Yellow	$\frac{1}{2}$ sieve	5/- 8/-	Dwarf.	Light.

PLUMS (COOKING).

Variety.	Season.	Colour.	How Sold.	Average Prices.	How Grown.	Soil.
Black Kentish Diamond	Sept.	Black	½ sieve	2/- 6/-	St. Dwf.	Ord.
Belle de Louvain ...	Sept.	Red ...	½ sieve	2/6 6/-	St. Dwf.	Ord.
Gisborne's ...	Sept.	Yellow	½ sieve	2/- 6/-	St. Dwf.	Ord.
Curlew ...	Sept.	Red ...	½ sieve	2/- 5/-	St. Dwf.	Ord.
Magnum Bonum (white)	Sept.	Yellow	½ sieve	2/- 5/-	St. Dwf.	Ord.
Pond's Seedling ...	Sept.	Pink ...	½ sieve	2/- 5/-	St. Dwf.	Ord.
Orleans (new) ...	Aug.	Red ...	½ sieve	2/- 5/-	St. Dwf.	Ord.
Monarch (Rivers')	Sept.	Black	½ sieve	2/- 5/-	St. Dwf.	Ord.
Smith's Purple Prolific	Aug.	Black	½ sieve	2/- 4/-	St. Dwf.	Ord.
Victoria ...	Aug.	Pink .	½ sieve	3/6 7/-	St. Dwf.	Ord.
Rivers' Early Prolific	July	Red ..	½ sieve	3/6 7/-	St. Dwf.	Ord.
The Czar ...	Aug.	Red ...	½ sieve	2/- 5/-	St. Dwf.	Ord.
Wyedale ...	Oct.	Black	½ sieve	3/6 8/-	St. Dwf.	Ord.

RASPBERRIES.

List of profitable sorts, with modes of marketing, average pre-war prices, etc.

Variety.	Colour.	How Marketed.	Average Prices.	Adaptability.
Carter's Prolific	Red	Tubs; punnets	3/- 5/-	Dessert; preserving.
Superlative ...	Red	Tubs; punnets	3/- 5/-	Dessert; preserving.
Norwich Wonder	Red	Tubs; punnets	3/- 5/-	Dessert; preserving.
Hailsham Berry	Red	Punnets ...	6d. to 1/-	Dessert.

STRAWBERRIES.

List of varieties grown for market, with modes of marketing, etc.

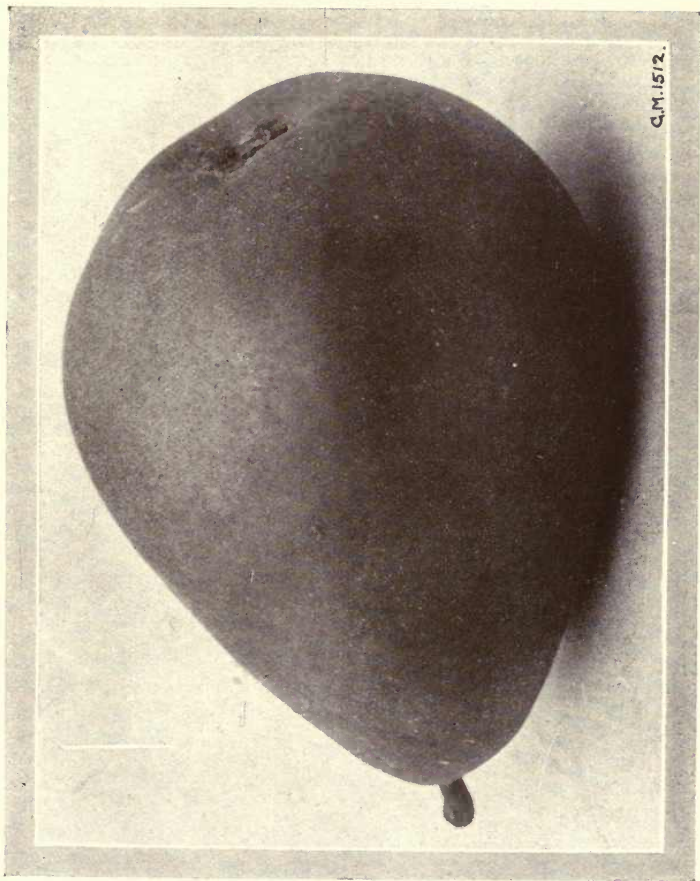
Name.	Season.	How Marketed.	Average Price.
Royal Sovereign ...	Early ...	(Chip Baskets (4 to 6 lbs.) Punnets (1 lb.)... Peck (12 lbs.) ... Barrels (56 lbs.)...	10d. to 4/6 2d. to 9d. 3/6 to 4/6 5/- to 6/-
Laxton's Noble ...	Early ...		
Sir Joseph Paxton ...	Mid-season		
Sir Charles Napier ...	Mid-season		
Givon's Late Prolific	Late ...		

MISCELLANEOUS TABLES.

MANURES FOR ORCHARDS.

Table showing the most suitable manures for each kind of fruit, the quantity of each to apply per acre, or otherwise, in grass, orchards and plantations, and the best time to apply them.

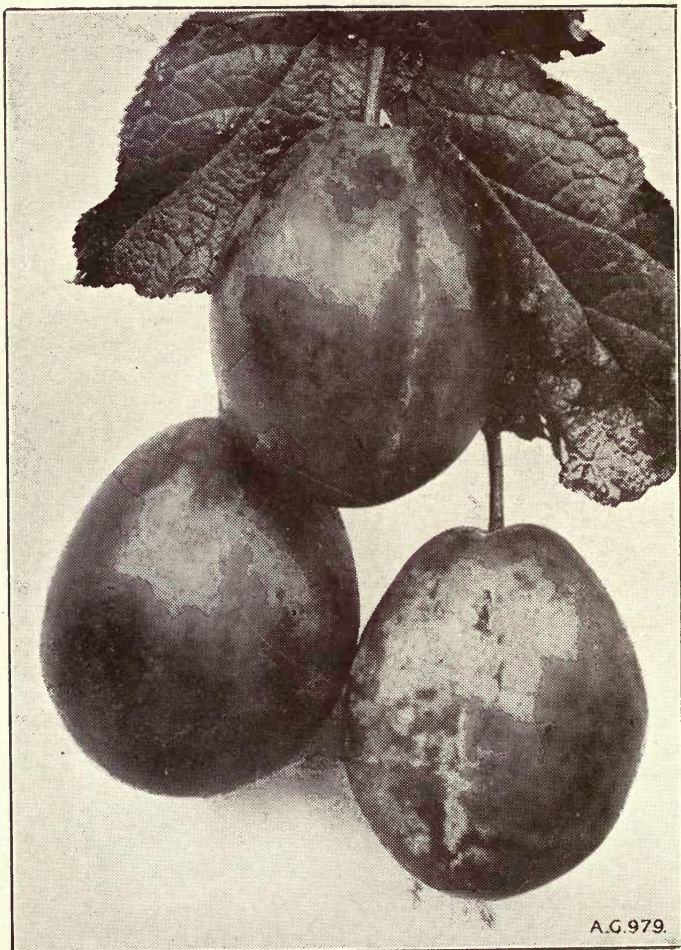
Fruit.	Manure.	Quantity.	When to apply.
Apple ...	Superphosphate ...	3 cwts. ...	After pruning.
" ...	Kainit ...	1½ cwts. ...	After pruning.
" ...	Nitrate of Soda ...	1 cwt. ...	When fruit is set.
" ...	Farmyard Dung ...	20 tons ...	Winter.
" ...	Liquid Manure.....	3 galls.sq.yd.	Winter ; June.
Cherry ...	Steamed Bone Meal	3 cwts. ...	February.
" ...	Sulphate of Potash	1½ cwts. ...	February.
" ...	Chloride of Soda...	¾ cwt. ...	February.
" ...	Sulphate Magnesia	½ cwt. ...	February.
" ...	Sulphate of Lime...	5 cwts. ...	February.
" ...	Liquid Manure ...	3 galls.sq.yd.	Winter ; June.
" ...	Nitrate of Soda ...	1½ cwts. ...	When fruit has set.
" ...	Farmyard Dung ...	20 tons ...	Winter.
Currants and Gooseberries	Farmyard Dung ...	20 tons ...	Winter.
" ...	Liquid Manure ...	3 galls.sq.yd.	Winter ; June.
" ...	Bone Meal... ...	3½ cwts. ...	Winter.
" ...	Kainit ...	1½ cwts. ...	Winter.
" ...	Nitrate of Soda ...	1½ cwts. ...	When fruit has set.
Nuts ...	Farmyard Dung ...	20 tons ...	Winter.
" ...	Woollen Rags ...	2 tons ...	Winter.
" ...	Liquid Manure ...	3 galls.sq.yd	Winter.
Pear ...	Farmyard Dung ...	20 tons ...	Winter.
" ...	Steamed Bone Meal	3 cwts. ...	After pruning.
" ...	Kainit ...	1 cwt. ...	After pruning.
" ...	Nitrate of Soda ...	1½ cwts. ...	Half in Mar. ; half in June.
" ...	Liquid Manure ...	3 galls.sq.yd.	Winter ; June.
Plums and Damsons	Farmyard Manure	20 tons ...	Winter.
" " ...	Liquid Manure ...	3 galls.sq.yd.	Winter ; June.
" " ...	Bone Meal... ...	3 cwts. ...	After pruning.
" " ...	Kainit ...	1½ cwts. ...	After pruning.
" " ...	Nitrate of Soda ...	2½ cwts. ...	Spring.
Raspberry ...	Farmyard Dung ...	20 tons ...	Winter.
" ...	Liquid Manure ...	3 galls.sq.yd.	Winter ; June.
" ...	Superphosphate ...	3 cwts. ...	Winter.
" ...	Kainit ...	1 cwt. ...	Winter.
" ...	Nitrate of Soda ...	2 cwts. ...	April.
Strawberry	Farmyard Dung ...	20 tons ...	Winter.
" ...	Bone Meal... ...	3 cwts. ...	Winter.
" ...	Kainit ...	1½ cwts. ...	Winter.
" ...	Soot ...	40 bushels ...	Spring.



G.M.1512.

DESERT PEAR, BEURRÉ HARDY

Season: October.



CULINARY PLUM, GRAND DUKE
Season: Mid-October.

APPROXIMATE COST OF PLANTING AN ACRE OF LAND WITH VARIOUS FRUIT TREES.
(Pre-war Prices.)

Name of Fruit.	Distance Apart.	No. of Trees per Acre.	Cost of Trees.	Cost of Preparing Land.	Cost of Manure.	Cost of Planting and Staking.	Total Cost.
Apples, Dwarf...	12 ft.	302	£8	£7	£5	7/6	£20 7 6
Apples, Stand...	20 ft.	108	£9	£7	£5	32/6	£22 12 6
Cherries, Bush...	12 ft.	302	£15	£7	£5	7/6	£27 7 6
Cherries, Stand.	30 ft.	48	£4 16	£7	£5	16/-	£16 17 6
Cobnuts ..	12 ft.	302	£8	£7	£5	7/6	£18 7 6
Currants ..	6 ft.	1,210	£12	£7	£5	14 -	£24 14 0
Damsons ..	15 ft.	193	£8	£7	£5	£3	£23 0 0
Filberts ..	12 ft.	302	£6	£7	£5	7/6	£18 7 6
Gooseberries ...	6 ft.	302	£6	£7	£5	14/-	£18 14 0
Pears, Dwarf ...	12 ft.	302	£7 10	£7	£5	7/6	£19 14 6
Pears, Standard	20 ft.	108	£9	£7	£5	32/6	£22 12 6
Plums, Standard	20 ft.	108	£7	£7	£5	32/6	£20 12 6
Plums, Dwarf...	12 ft.	302	£15	£7	£5	7/6	£27 7 6
Raspberries ...	4 ft. x 1 ft.	6,987	£10	£7	£5	15/-	£22 15 0
Strawberries ...	2 ft. 6 in. x 1½ ft.	11,000	£3	£7	£5	20/-	£16 0 0

APPROXIMATE COST OF CULTIVATION.

With yield and returns ; less rent, rates, and salesmen's commission from an acre of Orchard. (Pre-war values.)

Name of Fruit.	Cost of Digging and Hoeing.	Cost of Pruning.	Cost of Gathering Fruit.	Cost of Manure.	Average Yield, after 1 third Year.	Average Return (Gross).	Average Return (Nett).
Apple ...	32/-	20/-	£7	£5	6 tons	£60	£45 8
Cherry ...	32/-	20/-	£9	£5	4 tons.	£100	£83 8
Cobnut ...	32/-	20/-	£1	£5	10 cwt.	£14	£5 8
Currant...	32/-	22/-	£6	£5	2 tons.	£30	£16 6
Damson...	22/-	20/-	£12	£5	6 tons.	£96	£76 8
Filbert ...	32/-	20/-	£1	£5	10 cwt.	£14	£5 8
Gooseberry ..	32/-	22/-	£5	£5	3 tons.	£25	£12 6
Pear ...	32/-	20/-	£7	£5	5 tons.	£50	£35 8
Plum ...	32/-	20/-	£7	£5	7 tons.	£100	£85 6
Raspberry ...	32/-	12/-	£10	£5	2 tons.	£46	£28 18
Strawberry ...	60/-	15/-	£8	£5	2 tons.	£42	£22 5

WEIGHTS OF FRUIT.

Standard Weights in London Markets.

Apples	Half Sieves	20 to 24 lbs.
Apples	Bushels	40 to 48 lbs.
Blackberries	Pecks	12 lbs.
Blackberries	Strikes	12 lbs.
Cherries	Half Sieves	24 lbs.
Cherries	Pecks	12 lbs.
Cherries	Strikes	40 lbs.
Cobnuts	Half Sieves	20 lbs.
Currants	Half Sieves	12 lbs.
Currants	Pecks	12 lbs.
Currants	Strikes	12 lbs.
Currants	Chip Baskets	4 to 12 lbs.
Damsons	Half Sieves	28 lbs.
Damsons	Bushels	56 lbs.
Filberts	Half Sieves	20 lbs.
Gooseberries	Half Sieves	28 lbs.
Gooseberries	Chip Baskets	4 to 6 lbs.
Loganberries	Pecks	12 lbs.
Loganberries	Strikes	12 lbs.
Loganberries	Chip Baskets	4 to 6 lbs.
Mulberries	Pecks	12 lbs.
Mulberries	Strikes	12 lbs.
Mulberries	Chip Baskets	4 to 6 lbs.
Plums	Half Sieves	28 lbs.
Plums	Bushels	56 lbs.
Plums	Pecks	12 lbs.
Plums	Strikes	12 lbs.
Raspberries (pulled)... ..	Pecks	12 lbs.
„ (cut with stalks)	Pecks	8 lbs.
Raspberries	Strikes	12 lbs.
Raspberries	Chip Baskets	4 to 6 lbs.
Strawberries	Pecks	12 lbs.
Strawberries	Chip Baskets	4 to 6 lbs.
Walnuts	Bushels	40 lbs.

COST (PRE-WAR) OF DIGGING SOILS.

Soil.	How Cultivated.	Cost per rod.		Cost per acre.		Time required.
		s. d.	£ s. d.	£ s. d.	£ s. d.	
Light ...	Dug 1 spit deep	0 2	1 6 8			14 days per acre.
Ditto ...	Trenching 2 spits deep ..	0 10	6 13 4			28 „ „
Ditto ...	Bastard Trenching... ..	0 6	4 0 0			21 „ „
Ditto ...	Ploughing		0 12 0			1 day „ „
Heavy ...	Dug 1 spit deep	0 3	2 0 0			18 days „
Ditto ...	Trenching 2 spits deep ...	1 0	8 0 0			30 „ „
Ditto ...	Bastard Trenching... ..	0 8	5 6 8			24 „ „
Ditto ...	Ploughing		0 16 0			1½ „ „
Ordinary ...	Harrowing		0 1 0			10 acres per day.
Ditto ...	Cultivating		0 3 0			3 to 5 acres per day.
Ditto ...	Rolling		0 0 9			8 to 10 „ „

PROPAGATION OF FRUIT TREES.

Name of Fruit.	How Propagated.	Stock.	When.
Apple	Budding ...	Paradise; Crab ...	July.
Apple	Grafting ...	Paradise; Crab ...	March.
Apricot	Budding ...	St. Julien Plum ...	July.
Blackberry	Cuttings (Root) ...	... ..	March.
Cherry	Budding ...	Mahaleb	July.
Cranberry	Cuttings ...	... ..	March.
Currant	Cuttings ...	... ..	October.
Fig	Suckers ...	... ..	October.
Fig	Cuttings ...	... ..	October.
Gooseberry	Cuttings ...	... ..	October.
Grape	Cuttings ...	... ..	January.
Loganberry	Division ...	... ..	October.
Loganberry	Layering ...	... ..	Summer.
Mulberry	Budding ...	White Mulberry ...	August.
Mulberry	Cuttings ...	... ..	October.
Nectarine	Budding ...	Almond; Plum ...	July.
Peach	Budding ...	Almond; Plum ...	July.
Pear... ..	Budding ...	Seedling Pear; Quince	July.
Pear... ..	Grafting ...	Seedling Pear; Quince	March.
Plum	Budding ...	St. Julien	July.
Plum	Grafting ...	St. Julien	March.
Quince	Cuttings; layers	... ..	October.
Raspberries	Division ...	... ..	October.
Walnut	Seed ... ..	... ..	Nov.

DISTANCES FOR PLANTING FRUIT TREES.

Name.	In the Row.	Between Rows.	When Plant.
Apple (Standard) ...	20 ft.	20 ft.	Oct. to Feb.
Apple (Bush)	12 ft.	8 ft.	Oct. to Feb.
Apricot (Wall)	15 ft. ... ..	... ..	Oct. to Feb.
Blackberries	4 ft.	4 ft.	Oct. to Feb.
Cherry (Standard) ...	30 ft.	24 ft.	Oct. to Feb.
Cherry (Bush)	12 ft.	8 ft.	Oct. to Feb.
Currant	6 ft.	5 ft.	Oct.
Damson (Standard) ...	18 ft.	18 ft.	Oct. to Feb.
Fig	15 ft. ... ..	... ..	Oct.
Gooseberry... ..	6 ft.	5 ft.	Oct.
Loganberry	4 ft. ... ..	... ..	Oct. to Feb.
Nectarine	15 ft. ... ..	... ..	Oct.
Peach	15 ft. ... ..	... ..	Oct.
Pear (Standard)	20 ft.	20 ft.	Oct. to Feb.
Pear (Bush)	12 ft.	8 ft.	Oct. to Feb.
Plum (Standard)... ..	20 ft.	18 ft.	Oct. to Feb.
Plum (Bush)	12 ft.	8 ft.	Oct. to Feb.
Raspberry	2 ft.	4 ft.	Oct. to Feb.
Strawberry	1 ft.	30 ins.	Aug. to March.

FRUIT MEASURES.

(For weights see Table on p. 354.)

BUSHEL BASKET.—A measure equivalent to a sieve, which see.

BUSHEL SIEVE.—Same capacity as a sieve, which see.

HALF SIEVE.—Capacity, $3\frac{1}{2}$ imperial gallons. Diameter, $12\frac{1}{2}$ in.; depth, 6 in. Used for fruit.

HALVES.—The same as a half-sieve.

PECK.—One-fourth of a sieve or bushel.

POT.—A wicker basket used in Worcestershire and the Midlands for measuring fruit, Peas, etc. Shape, oblong; length, 21 in.; width, 14 in.; depth, 15 in. In the Birmingham market a "pot" of Apples weighs 63 lbs.; Cherries, 63 lbs.; Currants, 63 lbs.; Damsons, 72 lbs.; Plums, 72 lbs.; Gooseberries, 63 lbs. The same rule is observed in the Manchester market. At Liverpool a "pot" of Apples varies from 64 to 72 lbs.; Pears the same.

SIEVE.—A measure containing 4 pecks or 8 imperial gallons. Diameter, 15 in.; depth, 8 in. Used mainly as a fruit measure.

STONE.—A measure by weight of 14 lbs. Used chiefly in the northern markets.

STRIKE.—A basket used chiefly by the Middlesex growers for marketing fruit, etc. Capacity, one-fourth of a sieve or a quarter bushel, which see.



INDEX.

	PAGE		PAGE
AMERICAN GOOSEBERRY		Apples, Dessert for Market	347
MILDEW	298	„ Unthinned and	
„ Blight	268, 345	Thinned	29
Ammonia, Sulphate of	255	Apricot, Aspect for the ...	40
Apple Aphid	268	„ Bearing, Mode of ...	42
„ Bearing Mode of... ..	22	„ Brown Rot Disease,	
„ Blossom Weevil ...	268	the	297
„ Blotch Disease	296	„ Fruit, Thinning ...	44
„ Culture on Walls		„ History of the	39
and Fences	28	„ Modes of Training	
„ Diseases of the ...	29	the	41
„ Distances for Plant-		„ Moth, The	275
ing Trees	16	„ Pests of the ... 44,	275
„ Fruit, Gathering ...	28	„ Planting the	41
„ Storing	28	„ Propagation of the	40
„ Thinning	28	„ Protecting Blossoms	
„ History of the	9	of	44
„ Mildew, The	295	„ Sites for the	41
„ Modes of Training		„ Soil for the	40
the	14	„ Summer-pruning the	42
„ Pests	268	„ Varieties of the ...	45
„ Planting the	20	„ Winter-pruning the	43
„ Propagation of the	12	BARBERRY, Culture of the... ..	47
„ Pruning the	24	Basic Slag	256
„ Root-pruning the ...	26	Big Bud Mite, The	277
„ Rot, The	295	Bilberry, Culture of the ...	48
„ Scab, The	295	Birds	294
„ Site for Growing the	20	Blackberry, Culture of the	49
„ Soil for Growing the	16	„ History of the	49
„ Stocks for the	12	„ Propagation of the	50
„ Sucker, The	270	„ Pruning the	50
„ Varieties of the ...	30	Black Currant, Culture of	
for Cordon Culture	38	the	78
for the Midlands	37	„ Mite, The	277
for the North ...	37	Bladder Plum Disease	297
for the South ...	38	Blood	255
for Standards ...	38	„ Dried	255
Apples, Marketing	333	Bone-ash	256
„ Cooking for Market	346	„ Black	256

	PAGE		PAGE
Bone-ash, Meal	256	Crab, Varieties of the ...	76
Brown Currant Scale, The	281	Cranberry, Culture of the ...	77
Budding, Propagation by ...	205	Currant Aphis, The	279
Bullace, Culture of the ...	51	" Bud Mite, The	277
" Varieties of the	53	" Clearwing Moth,	
Bush Trees, Training	246	The	279
CANKER DISEASE	296	" Culture on Fences...	82
Cherries, Marketing	334	" in the Garden ...	81
" Varieties for Market	347	" on Walls	82
Cherry Aphis, The	276	" Diseases of the	298
" Aspect for Growing		" History of the	78
the	58	" Leaf Spot Disease ...	299
" Bearing, Mode of ...	59	" Modes of Training	
" History of the	56	the	80
" Leaf Scorch Disease,		" Pests	277
the	297	" Propagation of the	79
" Lifting and Root-		" Sawfly, The	280
pruning the	63	" Shoot Borer, The ...	279
" Mildew, The	297	" Soil and Situation...	80
" Modes of Training		" Summer-pruning the	
the	57	Red and White ...	82
" Pests of the	276	" Varieties of the	
" Planting the	58	Black	84
" Slugworm, The ...	277	of the Red	86
" Soil for the	57	of the White	87
" Stocks for the	57	" Winter-pruning of	
" Summer-pruning the	60	the	83
" Tree Borer, The ...	276	Currants, Marketing	334
" Varieties of the ...	64	" Varieties for Market	348
for Pyramids	66	Cuttings, Propagation by...	206
for Standards.....	66	DAMSON, Culture of the ...	53
for Walls	66	" History of the	51
" Winter-pruning the	61	" Propagation of the	51
Cobnut, Culture of the ...	67	" Varieties of the ...	54
" History of the	67	Damsons for Market	348
" Kentish System of		Drainage of Land	217
Growing the	71	EELWORMS	292
" Pests of the	73	Ermine Moth, The	272
" Propagation of the	68	Espalier Trees, Training ...	248
" Pruning and Train-		Explosives, Use of	218
ing the	69	FAN-SHAPED TREES, Training	250
" Storing Nuts of the	73	Fig, Bearing, Mode of	89
" Varieties of the ...	73	" Aspect for Growing	
Cobnuts for Market	349	the	90
Codling Moth, The	270	" History of the	88
Concrete Foundations	225	" Pests of the	92
Coral Spot Disease	296	" Planting the	91
Cordon Trees, Training ...	242	" Propagation of the	90
Crab, Culture of	75	" Protecting in Winter	92
" Propagation of the	76	" Root-pruning the ...	92

	PAGE		PAGE
Fig. Soil for the	90	Gooseberry, Summer-prun-	
" Summer-pruning the	91	" ing the	98
" Varieties of the	92	" Thinning Fruit of the	99
" Winter-pruning the	91	" Varieties of the	100
Filbert Bud Mite, The	284	Graft, Time to	216
" Culture of the	67	Grafting	208
" History of the	67	" Cleft	213
" Mode of Bearing	67	" Crown or Rind	212
" Pests of the	73	" Propagation by	208
" Propagation of one	68	" Saddle	213
" Pruning and Train-		" Side	215
" ing the	39	" Whip or Tongue	211
" Storing Nuts of the	73	Grape Vine, The	107
" Varieties of the	74	Guano, Fish	255
Filberts for Market	349	Gumming Disease	298
Fruit Diseases	295	HAILSHAM BERRY, The	186
" Enemies	268	KAINIT	256
" Gathering for Market	329	LABELLING TREES	223
" Grading for Market	331	Lackey Moth, The	271
" Measures	356	Laxtonberry, The	117
" Packages for Mar-		Layering, Propagation by...	207
" keting	332	Lime	256
" Packing for Market	329	" Nitrate of	255
" Plantations	323	" Superphosphate of	256
" Propagation of	355	Loganberry, History of the	114
" Storage of	260	" Propagation of the	115
" Store, The	260	" Pruning the	116
" Temperature of the	266	" Soil and Situation	
" Tree Beetle, The	273	" for the	115
" Trees, Protecting	305	" Walls, Culture on	116
" Weights of	354	Lowberry, The	117
" When to Gather	260	MAGPIE MOTH, The	283
GLASS COPINGS FOR WALL		Manures, Applying	257
FRUITS	305	" Artificial	254
Goat Moth, The	274	" for Apples	257, 352
Gooseberries for Market	349	" for Apricots	258
" Marketing	335	" for Blackberries	259
Gooseberry, Black-knot		" for Currants	258, 352
" Disease	299	" for Cherries	258, 352
" Diseases	298	" for Damsons	258, 352
" History of the	94	" for Figs	258
" Leaf Cluster Cups... ..	299	" for Gooseberries	258, 352
" Mildew	299	" for Loganberries	259
" Modes of Training the	97	" for Mulberries	259
" Pests of the	283	" for Nectarines	258
" Planting the	98	" for Nuts	259, 352
" Propagation of the	95	" for Orchards	352
" Red Spider, The	283	" for Peaches	258
" Soil and Situation		" for Pears	257, 352
" for the	96	" for Plums	258, 352

	PAGE		PAGE
Manures for Raspberries	259, 352	Nectarines, Thinning Fruit	
" for Strawberries	259, 352	of the	131
" Natural	253	" Varieties of the ...	135
" Nitrogenous	254	" Watering and	
" Phosphatic	255	Syringing the	133
" Potash	256	Nitrolim	255
Manuring, Mistakes in	252	Nut Pests	284
Market Culture	308	" Weevil, The	284
" Fruits	346	ORCHARDS	308
Marketing Apples	333	" Arrangements for	
" Cherries	334	Planting	311
" Currants	334	" Cost of Cultivating	353
" Gooseberries	335	" Cost of Planting ...	353
" Peaches and Nec-		" Distances for Plant-	
tarines	335	ing	311
" Pears	335	" Manures for	352
" Plums	335	" Planting Trees in ...	311
" Raspberries	336	" Protecting Trees in	312
" Strawberries	336	" Pruning Trees in ...	315
Marl	257	" Shelter for	309
Mealy Plum Aphis, The ...	288	" Site for	309
Medlar, History of the	117	" Soil for	309
" Pests of the	120	Oyster-shell Bark Louse,	
" Planting the	119	The	289
" Propagation of the	119	PEACH Aphis, The	284
" Pruning the	119	" History of the	125
" Storing the Fruit ...	120	" Disbudding the ...	129
" Varieties of the	120	" Leaf Curl Disease ...	297
Mulberry History of the ...	121	" Mode of Bearing ...	129
" Pests of the	124	" Mode of Training	
" Planting the	123	the	128
" Propagation of the	122	" Propagation of the	126
" Pruning the	123	" Pests of the	284
" Soil and Situation		" Planting the	128
for the	122	" Protecting Blossoms	
Mussel Scale, The	274	of the	132
NECTARINE, Disbudding the	129	" Pruning the	131
" History of the	125	" Scale, The	284
" Mode of Bearing ...	129	" Situation for Grow-	
" Mode of Training the	128	ing the	127
" Pests of the	133	" Soil for Growing the	126
" Planting the	128	" Thinning Fruits of	
" Propagation of the	126	the	131
" Protecting Blossoms		" Varieties of the	134
of the	132	" Watering and	
" Pruning the	131	Syringing the ...	133
" Situation for Grow-		Peaches, Marketing	335
ing the	127	Pear, Bearing, Mode of ...	144
" Soil for Growing the	126	" Diseases	298
		" Gathering the Fruit	148

INDEX.

361

	PAGE		PAGE
Pear, History of the	136	Plum Aphis, The	287
" Leaf Blister Mite...	287	" Bearing, Mode of ...	163
" Leaf Blister Moth ...	285	" Disbudding the ...	163
" Manuring the	146	" Fruit, Gathering,	
" Midge, The	285	etc.	167
" Modes of Training		" Fruit Sawfly, The...	289
the	141	" History of the	158
" Pests of the	285	" Modes of Training...	161
" Planting the	143	" Pests of the	287
" Propagation of the	138	" Planting the	162
" Root-pruning the ...	146	" Propagation of the	159
" Scab Disease	298	" Root-pruning the ...	166
" Situation for the ...	140	" Sawfly, The	288
" Soil for the	140	" Situation for the ...	160
" Stocks for Grafting	139	" Soil for the	160
" Storing the Fruit ...	148	" Stocks for the	160
" Summer-pruning the	146	" Summer-pruning the	165
" Thinning Fruits of		" Thinning the Fruit	167
the	148	" Varieties of the	168
" Varieties of the ...	149	" Winter-pruning the	166
" for Bushes, etc...	156	Plums, Marketing	335
" for Cordons	156	" Varieties for Market	350
" for Standards ...	157	Pollination of Fruit Blossoms	301
" for Walls	157	Potash, Nitrate of	255
" Winter-pruning the	146	" Sulphate of	256
Pears Marketing	335	Propagation of Fruit Trees	202
" Varieties for Market	350	Protecting Fruit Trees ...	305
Pests	268	Pruning, Philosophy of ...	226
Phenomenal Berry, The ...	117	" Newly-planted Trees	234
Pith Moth, The	275	" Principles of	226
Plantations, Aspect for ...	323	" Root	238
" Cost of, per acre ...	353	" Summer	232
" Distances for Planting	325	" Tools and Appliances	
" Examples of	326	for	237
" Shelter for	323	" Winter	233
" Sites, Preparing ...	324	Pyramid Trees, Training ...	243
" Soil for	324	QUINCE, Fruit, Gathering	
Planting	217	and Storing	176
" Choosing the Site ...	217	" History of the	175
" Cost of, per acre ...	353	" Propagation of the	176
" Depth for	219	" Soil and Situation	
" Distances for	355	for the	176
" Drainage before ...	218	" Varieties of the ...	177
" Mode of	219	RABBITS AND HARES	293
" Shelter	217	Raspberry, Autumn-bearing,	
" Sites for	218	The	184
" Time for	220	" Beetle, The	290
" Treatment of Trees		" Diseases	300
before	219	" Gall Fly, The	292

	PAGE		PAGE
Raspberry, History of the	178	Strawberry Pests	292
,, Modes of Growing		,, Planting the	190
the	180	,, Propagation of the	188
,, Moth, The	290	,, Protecting the	191
,, Pests of the	290	Soil and Position	
,, Planting the	180	for the	189
,, Propagation of the	179	Strawberry-raspberry, The	196
,, Pruning the	182	Suckers, Propagation by	208
,, Rust Disease	300	Superphosphate of Lime	256
,, Soil and Situation		TRAINING BUSH TREES	246
for the	180	,, Cordon Trees	242
,, Spot Disease	300	,, Espalier Trees	248
,, Varieties of		,, Fan-shaped Trees	250
Autumn-bearing	185	,, Nut Trees	251
,, Varieties of		,, Pyramid Trees	243
Summer-bearing	184	,, Standard Trees	251
,, Weevil, The	291	Trees, Age to Buy	18
Raspberries, Marketing	336	,, Treatment of Newly-	
,, Varieties for Market	351	bought	18
Red Currant, Culture of the	78	Unfruitful	27
Red Plum Maggot, The	288	UNFRUITFULNESS, Causes	
Root-pruning Apple Trees	26	of	301
SEEDS, Propagation by	202	VINE, Disbudding the	111
Silver-leaf Disease	298	,, History of the Grape	107
Slugs and Snails	293	,, Pests of the	112
Smudge Fires	307	,, Planting the Grape	09
Social Pear Sawfly, The	285	,, Propagation of the	108
Soda, Nitrate of	254	,, Pruning and Train-	
Soils, Cost of Digging	354	ing the	109
Soot	255	,, Soil and Situation for	108
Spraying Fruit Trees	337	,, Varieties of the Grape	113
,, Spring	342	,, Watering and Feed-	
,, Summer	343	ing the	111
,, Winter	340	WALNUT, History of the	197
Staking Trees	231	,, Mode of Bearing	198
Standard Trees, Training	251	,, Pests of the	199
Strawberries, Marketing	336	,, Planting the	198
,, Varieties of the	193	,, Propagation of the	198
,, for Market	351	,, Pruning the	199
Strawberry, Alpine, The	192	,, Storing Nuts of the	199
,, Diseases	300	,, Varieties of the	200
,, Duration of Beds of		Wasps	293
the	191	White Currant Scale, The	282
,, Hautbois, The	192	Winter Moth, The	270
,, Leaf Spot Disease	300	Wineberry, Culture of the	201
,, Management of the	190	,, History of the	201
,, Mildew	300	Wood-ashes	256
,, Perpetual-fruiting,		Wood Leopard Moth, The	275
The	192	,, History of the	187

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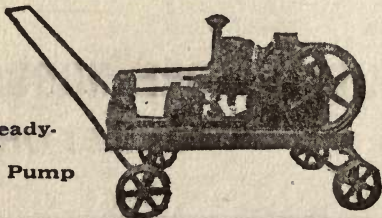
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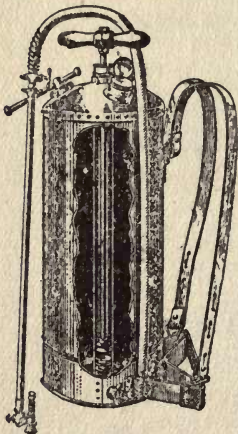
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