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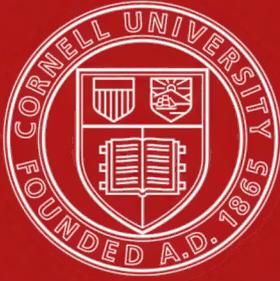
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THE FRUIT GARDEN



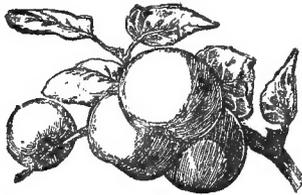
A CHERRY ORCHARD IN SPRING.

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THE
FRUIT GARDEN

BY
GEORGE BUNYARD, V.M.H.
AND
OWEN THOMAS, V.M.H.

SECOND EDITION



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PREFACE TO SECOND EDITION

It has been very gratifying to receive assurances that "The Fruit Garden" has not only proved of the greatest help to the amateur, but has also had considerable influence in extending fruit culture in this country, and in directing its practice on sound lines. The authors, therefore, are very glad to be able to announce a cheaper edition of this work, admittedly the finest book on the culture of fruit trees yet published, with the object of placing it within the reach of those to whom the higher price was prohibitive. Some slight revision of the contents has been made, but the book remains practically the same. "The Fruit Garden" appeals to the amateur gardener by reason of the concise and plainly written information and faithful diagrams it contains, and will be found equally valuable by the professional grower of wider experience in fruit culture out-of-doors, and under glass. In view of the efforts now directed towards the teaching of practical gardening in elementary and secondary schools and by County Councils, "The Fruit Garden" will be found invaluable, and should be in the hands of every student. The authors feel confident that this cheaper edition will be welcomed by all growers of fruit, whether for home or for the market, and that it will give still further impetus to fruit culture in Britain.

February 1906.

PREFACE TO FIRST EDITION

IN this country fruit culture has only of late years received the recognition its importance deserves. Its value has been brought home to us by the enormous importations of fruit from the Continent, our Colonies, and America, which fail altogether to meet the increasing demand. That we should have to depend so largely upon supplies from abroad, when our own country can produce fruit of such excellence, is a serious reflection upon the intelligence and enterprise of British fruit-growers. Landowners and cultivators in Britain are thereby deprived of their share of the wealth sent abroad for articles which can be grown quite as well at home, and for which the best markets are ready at our doors.

There are signs throughout the kingdom that we are slowly waking up, both to the importance of the subject and the possibilities of its development. This is manifest in several ways: for instance, fruit culture is now an optional subject in numerous schools; hundreds of acres of fruit trees are planted annually, either in establishing new or in renovating old orchards, and anxious inquiries are continually received by the horticultural Press for information on this important matter. Impressed by these considerations, it was thought by the authors and other experts that a comprehensive and up-to-date work, dealing with the question in a thoroughly practical manner, would, at the present time, render valuable aid in bringing this movement to a successful issue. It is in the hope that their life-long and practical experience in the various phases of fruit culture may prove useful, that the authors place their services at the disposal of the public. No efforts have been spared to make "The Fruit Garden" a trustworthy guide to the production of fruit, both to the professional gardener who devotes his life to the work, and to

the many amateurs who engage in gardening as a recreation. The help of experts in various special branches of fruit-growing has been secured, and their several names appear above the chapters they have contributed.

The methods practised in America, France, and the Channel Islands are also described by competent authorities in each of those countries, in order that cultivators may be able to take advantage of their advice if it should promise to lead to better results than those at present obtained. It is also hoped that the numerous sketches and photographic illustrations, which have been selected primarily for their teaching value, will be found helpful.

We are much indebted for the opportunity of illustrating various fruits, fruit trees, &c., to Messrs. James Veitch & Sons, Limited; Thomas Rivers & Son; Mackenzie & Moncur, Limited; Thos. Rochford & Sons; Joseph Rochford; Peter Kay, and James Walker; and for the outline drawings of fruits to members of Mr. George Bunyard's family.

Hearty thanks are also due to Mr. H. H. Thomas (sub-editor of *The Garden*), who has rendered valuable assistance.

GEORGE BUNYARD.
OWEN THOMAS.

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INTRODUCTION

DEFINITIONS AND EXPLANATIONS

THROUGHOUT this work it is possible that terms may be used which are not familiar to the general reader ; the authors therefore deem some explanation to be necessary. In descriptions and lists of fruits the name first given is the generally accepted one, and synonyms are enclosed in brackets. The letter T signifies that the fruit against which it is placed is suitable for table or dessert. The letter K indicates the variety to be suitable for cooking (kitchen) purposes only.

In determining varieties of hardy fruits the skin is an important factor ; this varies so considerably in colour, markings, and substance as often to enable a fruit to be identified by this means alone. The term *greasy* is used in reference to those fruits which, either on the tree or when stored, have a somewhat oily surface. This is more often developed upon the earlier apples, although some late ones are not free from it. The word *dry* indicates a skin that has not this greasy appearance. A *harsh* surface is one of such a texture as almost to set one's teeth on edge when handling the fruit ; the skin is said to be *rough* when roughness can be felt by the hand ; the terms *smooth* or *shining* are given to fruits whose surfaces are free from russet or harshness.

The variability of colour in hardy fruits often is the cause of difficulty in their identification, because the locality, soil, form, and position of the tree make a great difference, and affect the colour to a remarkable degree. For instance, an apple like Cockle's Pippin, when in characteristic form, should be entirely covered with a thin netted russet ; but in some seasons, like those of 1898 to 1900, it has been almost perfectly smooth and green. Another of our brightest apples, Gascoigne's Scarlet Seedling, frequently fails to colour in the Midlands and the North ; while the fruit exhibitions at the Crystal Palace have shown us apples from Hereford with cheeks quite scarlet, and which in Kent are usually pale. In connection with this subject of colour it should be stated that the ground colour of the fruit is first named. All the descriptions have been made from typical specimens, suitable for exhibition ; in other words, from fruits in the best possible condition, so that a considerable discount must be allowed in the case of those badly cultivated, not thinned, or from counties less happily situated than the more favoured districts. Again, some fruits entirely alter their appearance after they have been stored for a few months. The more or less pronounced green colour which most fruits have at the time of gathering gives way to paler tints ; a primrose colour, pale orange, &c., appear, then the colour on the sunny side, whether crimson, bronze, scarlet, as may be, develops.

The flesh of an apple is different when fully ripe or when it has been stored for any time; each of those hereafter described has been tasted at its best period. The term *firm* may be taken to apply to those fruits which, when cooked, become more or less jelly-like or semi-transparent, as, for instance, the well-known cooking apple, Wellington. The word *mealy* refers to those which cook into a creamy pulp. Such apples do not "fall" in cooking, and are excellent for dumplings, as *e.g.* Blenheim Orange and Waltham Abbey Seedling. The term *crystalline* refers to those which have flesh of a snow-like appearance; these, as a rule, are good cookers. The term *dry*, with reference to the flesh, indicates fruits which are neither juicy nor firm, but frequently make good baking apples, as Winter Queening.

To estimate flavour, which is entirely a matter of taste and opinion, is difficult, but the terms used will probably be useful as a guide. We may give the following examples:—Rich (Egremont Russet), sugary or sweet (King of the Pippins), spicy (D'Arcy Spice), aromatic (Ross Nonpareil), dry (Winter Queening).

It is premised that all good gardens have proper fruit rooms in which to conserve their fruit; one constructed after the manner of such an inexpensive and effectual one as that detailed elsewhere is possible to all. It must be evident that it is a great advantage to be able to keep fruit for ten months in perfect condition. A melting pear in March, a cooking apple for April and May use, and a choice dessert fruit for the same periods are well worth striving for, to say nothing of storage in large quantities, when excellent prices may be obtained for the same fruits that during a glut on the markets in the picking season would be sold for next to nothing. We state what is considered to be the best period for use of each fruit. In light, warm soils this period may be earlier, while fruit from cold land may be somewhat later. In this connection we may remark that perfectly ripe and matured fruit keeps better than when it is gathered before its development is complete, and no very late fruits can be perfect unless left on the trees well into November.

Wherever the term "garden tree" is used, it refers to trees on the Paradise stock. Where it is stated "not suitable for cordons," it is because the growth is too robust, causing wide gaps between the fruiting spurs; "not suitable for standards" indicates a "weeping" habit of growth, which is unsuitable for trees grown in orchards where cattle or sheep are allowed. Yet in the hands of a skilful gardener a robust tree may be made to form a cordon, or the weeping tree may be valuable in a plantation on cultivated land. By "orchard tree" is meant a standard on the Crab or Free stock, permanently planted on grass land; the word "Paradise" refers to trees for planting in gardens, or market trees on cultivated ground.

The form of the fruits can be seen from the sections given; where they vary, this will be mentioned in the descriptions.

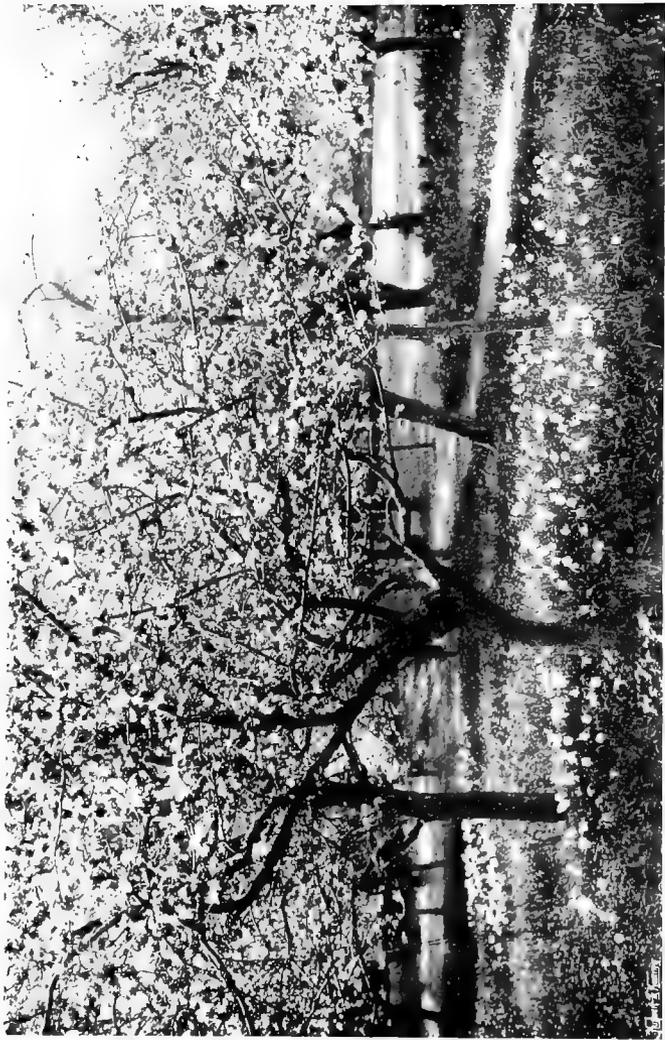
Where fruits have been accorded recognition by the Royal Horticultural Society they are classed F.C.C. (first-class certificate) or A.M. (award of merit). Either of these is a stamp of good quality. The year in which the award was granted is given.

INTRODUCTION

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Great difficulty has been experienced in limiting the number of apples to even one hundred varieties, and other fruits in proportion ; even then several really useful fruits had to be omitted. As it is intended that the information given in this work shall apply to all parts of Great Britain, the lists must of necessity be comprehensive. No really good old variety is omitted, or any new one which bids fair to become a standard variety. Several other apples worthy of culture, in addition to the list of one hundred, are given, but we have been anxious not to bewilder the amateur or small grower. Short lists for special purposes are given for his guidance.

Any peculiarity in growth, flower, or foliage is mentioned ; so where no remarks are made, the tree or fruits referred to may be taken as normal.



GRASS PATHS AND SPRING FLOWERS IN THE ORCHARD.

THE FRUIT GARDEN

CHAPTER I

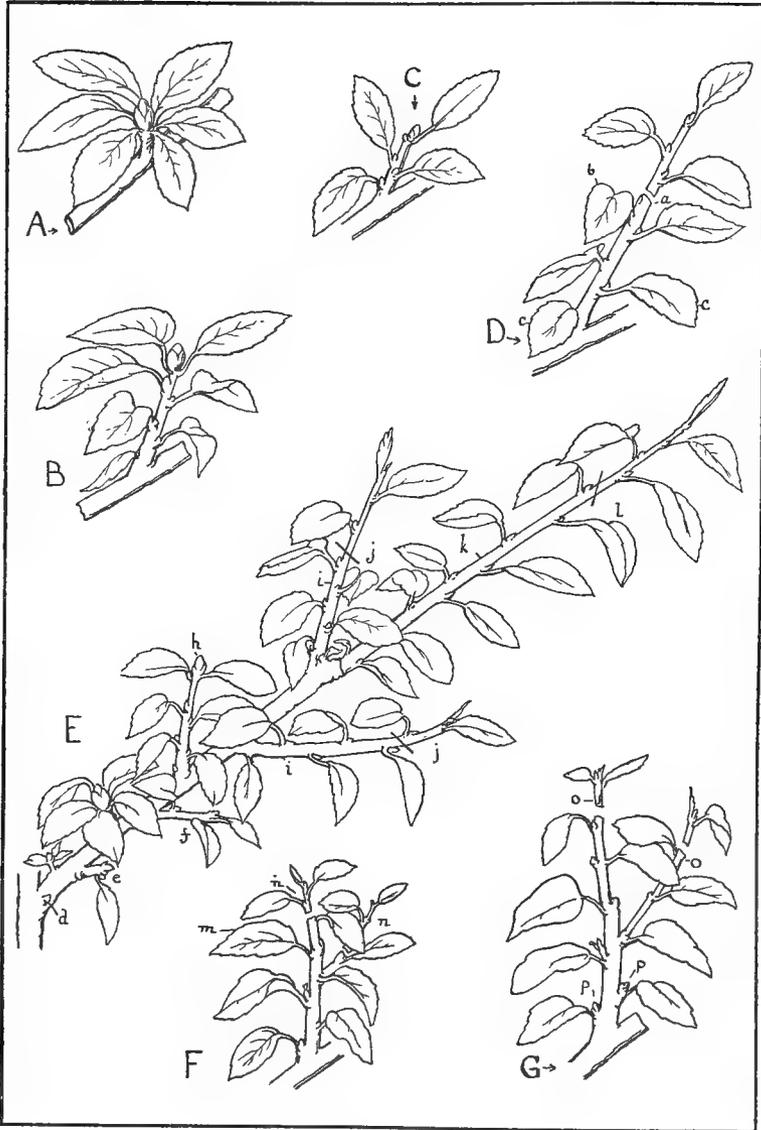
THE APPLE

BY GEORGE BUNYARD

THE planting of orchard standard apple trees, which are best upon the Crab or Free stock, is carried out as recommended in the chapter on Planting. Whenever practicable it is best to plant orchard trees in arable cultivated land, but corn crops must not be grown with them. The trees should not be pruned the first year of planting, and subsequent pruning should be carried out with the view of making the branches assume a bowl or cup shape. This is attained by always cutting the shoots on the outside of the tree to a bud pointing outwards, and keeping the inner shoots pruned back to four eyes; after about five years' growth little pruning will be needed, except just sufficient to regulate the branches, and to remove useless central shoots or boughs which cross each other. It is often necessary to plant orchard fruit trees in grass, and in that case care must be taken to leave a circle of 3 feet diameter around the base of each tree free from grass and weeds, and the space must be regularly hoed to prevent the soil cracking. In all cases the trees must be protected against the possibility of injury from cattle by the use of wire-netting (1-inch mesh), by boughs tied round the tree, or by cradles sufficiently high to keep off horses and cattle. These cradles are made either square or triangular, the upright stakes should be from $1\frac{1}{2}$ to 2 feet apart at the base, and from 3 to $3\frac{1}{2}$ feet apart at the top, with cross staves about 1 foot apart. If during the course of a few years the trees have made less than 1 foot of growth annually, they should be manured, but a hard, firm, well-ripened growth is preferable to strong sappy shoots which may not be well ripened before the winter, and which may suffer from the effects of frost; for the same reason the boughs should be well thinned out, and the centres of the trees kept open to let in sun and air. In this way the fruit will be of good size and colour, and of the best quality as well.

SUMMER PRUNING is better left until early August, as starting sooner only induces a secondary growth, which has to be removed; whereas, when per-

THE FRUIT GARDEN



PRUNING THE APPLE (SUMMER)

formed at the time named, the buds below swell and lay the foundation of fruit spurs. The winter pruning may be done in open weather from October to March. With garden trees the same method of planting should be observed, but as ordinary garden soil is quite rich enough for fruit trees, they need no fresh manure. Most garden trees of the apple are upon the Paradise stock; therefore, when planted, the junction of the stock and scion should be below the soil.

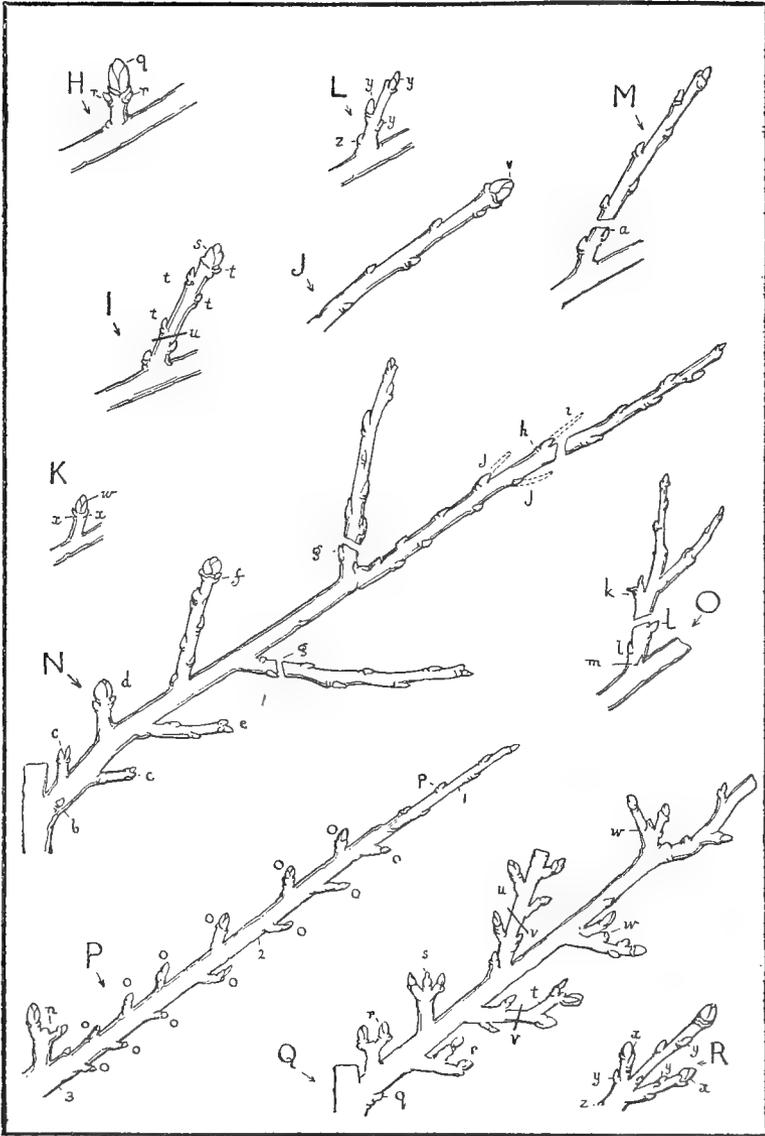
Trees on the Paradise stock may be pruned the first year after planting, and preferably in February. Either pyramid or bush trees may be formed. The leading shoots of cordon trees should not be shortened unless they fail to make spurs, and the lateral shoots of espalier trees should not be pruned back for a season, as such a proceeding might check the regular formation of the lateral tiers of branches; but after a year's growth the leaders may be regulated, taking care to cut the lower branches a foot longer than the upper ones, as the sap naturally rises. If the upper branches are allowed to extend beyond the lower ones the latter may die back. Any long or ill-placed shoots on the laterals may be shortened in August to within four buds or "eyes" of their bases. In no cases should trees of any form be allowed to carry much fruit the first year. As soon as garden trees produce an abundance of gross wood and very little fruit, they require to be root-pruned. Instructions for this are given elsewhere. When once the trees have formed fruit spurs and produce fruit regularly, this operation need not be repeated, and, as a precaution, only a portion of the trees should be root-pruned at once, for, if the following spring should be dry, the crop may be entirely lost. The largest trees must be operated upon with judgment, but after two root prunings they generally bear satisfactorily. Old fruitless trees that have been closely pruned become fruitful when the boughs are well thinned and the trees allowed to extend themselves with, of course, slight regulation.

PRUNING THE APPLE (SUMMER)

CHARACTERISTIC GROWTHS.—A. Short stubby growth, the leaves disposed almost in a circle, with a blossom bud in the centre; this is a fruitful spur, and must *not* be pruned. B. Growth intermediate between a spur and a wood shoot, not extending beyond a few inches; the leaves are closely set, with somewhat prominent buds in the axils, and terminated by a conspicuous bud, often a blossom bud; this is a short stubby shoot, and must be pruned neither in summer nor winter. C. Short stubby growth, but not with leaves disposed in a circle, and the terminal bud pointed, not bold; this is an imperfect spur, and must not be shortened, as it will (most likely) produce some blossom buds the following summer. D. A side shoot more than five points long, and requiring either pinching in summer or shortening in winter, or both; (*a*) point of stopping at third good leaf (*b*); not counting small basal leaves (*c*). E. Branch with these characteristic growths; (*d*) basal bud not started into growth, therefore termed *latent*, and available for cutting down to (in case of necessity) to originate a new branch; (*e*) short stubby growths—incipient spurs; (*f*) short shoot suitable for retaining to form spurs; (*g*) a spur with blossom bud at apex, on which fruit is borne the following summer; (*h*) a growth intermediate between a spur and a growing shoot, terminated by a fruit bud; common in some varieties of apple, and not to be shortened for obvious reasons; (*i*) side shoots that must be either pinched in summer or shortened in winter, or both, unless required for filling vacant space, or furnishing the tree with branches which must be at least one foot apart; (*j*) point of pinching; (*k*) continuation of branch growth, trained intact in case of wall or espalier tree, or pinched at (*l*) if a bush or pyramid tree.

PINCHING OF SIDE SHOOTS.—F. Shoot at second stopping; (*m*) point of first pinching (see shoot D.); (*n*) laterals stopped to one leaf. G. Shoot after second pinching; (*o*) sub-laterals to be stopped, if necessary to one leaf, as shown, but not after early part of September; (*p*) buds plump. The object of stopping is to make the buds develop without starting into growth.

THE FRUIT GARDEN



PRUNING THE APPLE (WINTER)

THE PARADISE STOCK.—Much misconception has arisen with regard to this particular stock for grafting, because in the earlier days of its adoption the French variety was in general use. This is a starving stock, and the apple trees grafted upon it are not long-lived. The Nonsuch, Broad-Leaved, Doucin or Dutch, and the true English varieties of the Paradise stock, however, are now generally used, and are found to be quite satisfactory. Apple trees upon these stocks have a vigour equal to those upon the Crab or Free stock, but at the same time they have the capacity of forming fruit-producing spurs while the trees are quite young; heavy crops are often taken from trees only two years old, and it is utter nonsense to talk of their giving up or dying out after a few years. There are throughout the country apple trees upon the Paradise stock fifty years old in perfect health and vigour, and it must have been ignorance of their many virtues that caused them to be condemned by the Herefordshire Association so recently as 1900. Bush apple trees upon the above stocks not only produce finer and cleaner fruit, but they bear fruit some five years before trees on the Crab stock, and moreover, often produce freely when the Crab trees are bare. They may be depended upon to keep in good bearing for at least fifty years, provided they are planted so that the junction of scion and stock is below the soil; eventually they give double the return that can be obtained from orchard trees. Especially is this the case in a good season; then the fruit from trees on the Paradise stock sells freely, because it is handsome, while orchard fruit is small and comparatively unsaleable.

PRUNING THE APPLE (WINTER)

CHARACTERISTIC LEAFLESS GROWTHS.—H. Fruitful spur; (*g*) blossom bud from which fruit is produced; (*r*) side buds forming future spurs for bearing. I. Short shoot terminated by a fruit bud; (*s*) blossom bud; (*t*) wood buds likely to form spurs in following summer; (*u*) point of pruning if desired to originate a growing shoot for furnishing the tree; this, of course, prevents bearing for some time. J. An extension growth terminated by a blossom bud; (*v*) fruit bud, a peculiar mode of bearing in some varieties. K. An incipient spur; (*w*) terminal bud, probably developing in following summer into a blossom bud; (*x*) side buds usually forming spurs. L. Short stubby shoot with wood buds; (*y*) buds usually developing spurs in following summer; (*z*) basal buds commonly remaining dormant, called *latent*. M. Side shoot from a branch not pinched in summer; (*a*) point of winter pruning, the object being to keep growths near branches, and induce spur formation. N. Branch with characteristic growths (page 2 E, Leafless); (*b*) basal bud; (*c*) incipient spurs; (*d*) perfected spur with blossom bud at apex; (*e*) short stubby shoot usually forming spurs in following summer; (*f*) short shoot intermediate between a spur and growth—terminated by a fruit bud; (*g*) side shoots shortened to two buds; (*h*) continuation of branch growth shortened to point desired for originating growths to furnish tree with branches for bearing or filling vacant spaces; (*i*) continuation shoot; (*j*) side shoots; if not so desired growth left intact. O. A pinched side shoot, winter pruned (page 2 G, Leafless); (*k*) bud started, and not desirable as a pruning bud; (*l*) buds plump, and likely to form spurs in following season; (*m*) basal bud, not usually starting into growth the next spring, but remaining *latent*. P. Branch in very desirable state (*N* *h*, not shortened); (*n*) a shortened side shoot having in previous year (*N* *g*) formed spurs; (*o*) spurs; (*p*) continuation shoot; 1=one year, 2=two year, and 3=three years' old wood. Q. Three years' old wood (*N* as far as *g*); (*q*) basal bud; (*r*) spurs having formed blossom buds; (*s*) spur that fruited previous summer and side buds developed into incipient spurs; (*t*) short shoot having formed two blossom buds and three incipient spurs; (*u*) shoot intermediate between a spur and a shoot which has fruited and developed two spurs with blossom bud and three incipient spurs; (*v*) points of shortening when desired to keep spurs near branch—this is best done after the fruit is gathered; (*w*) shortened side shoots having formed spurs. R. Extremity of branch with fruit buds at points; (*x*) blossom buds; (*y*) growth with wood buds usually developing into spurs the following season; (*z*) two years' old wood; this is a common mode of bearing with some varieties, and with most when the trees are fully grown.

THE APPLE AS A CORDON ON WALLS

It is very rarely that apple trees are promoted to the dignity of a position on a wall, but there are occasions which justify this method of culture, and when such favour is shown, the apples prove to be larger, of better quality and flavour, and much improved in colour and appearance. In many Scottish, North, and North Midland counties, conditions are so unfavourable to the culture of our best dessert apples that if these are to be had in anything like good condition, either for dessert or for exhibition, a wall must be had recourse to; even those more favoured by climatic conditions who wish to grow the apple to the highest excellence out of doors, should plant a few cordon trees on their walls. There are many vacant spaces between existing trees that would hold a cordon or two without inconvenience, but where it can be given, a west aspect, no doubt, would be best. The finest apples I have ever seen were grown on the slated roof of a shed in a garden in North Wales, Bodnant, near Conway. These were tall standards planted against the wall of the shed, and the trees were trained over the roof. This is a plan worth following, plenty of such roofs exist in gardens, and at present give no return whatever.

The following dessert varieties would well repay the grower for any space on a wall devoted to them :—

Beauty of Bath, Irish Peach, Kerry Pippin, Lady Sudeley, Worcester Pearmain, James Grieve, Cox's Orange Pippin, Ribston Pippin, Cox's Pomona, Mother, Washington, Allington Pippin, Gascoigne's Scarlet, Scarlet Nonpareil, King of Tompkin's County, Rosemary Russet, Fearn's Pippin, Court Pendu Plat (all the above are also suitable for exhibition); King of the Pippins, Brownlee's Russet, Adam's Pearmain, Allen's Everlasting, Mabbott's Pearmain, Blenheim Orange, Sturmer Pippin.

The following varieties, although not strictly dessert, are indispensable for exhibition :—

Red Astrachan, Emperor Alexander, Peasgood's Nonsuch, White Transparent, Duchess of Oldenburg, The Queen, Golden Noble, Bismarck, Beauty of Kent, William's Favourite, Newton Wonder, Calville Blanche.

The last-named beautiful and delicious apple succeeds best when grown in pots under glass, but may be planted against a warm wall with fair prospect of success.

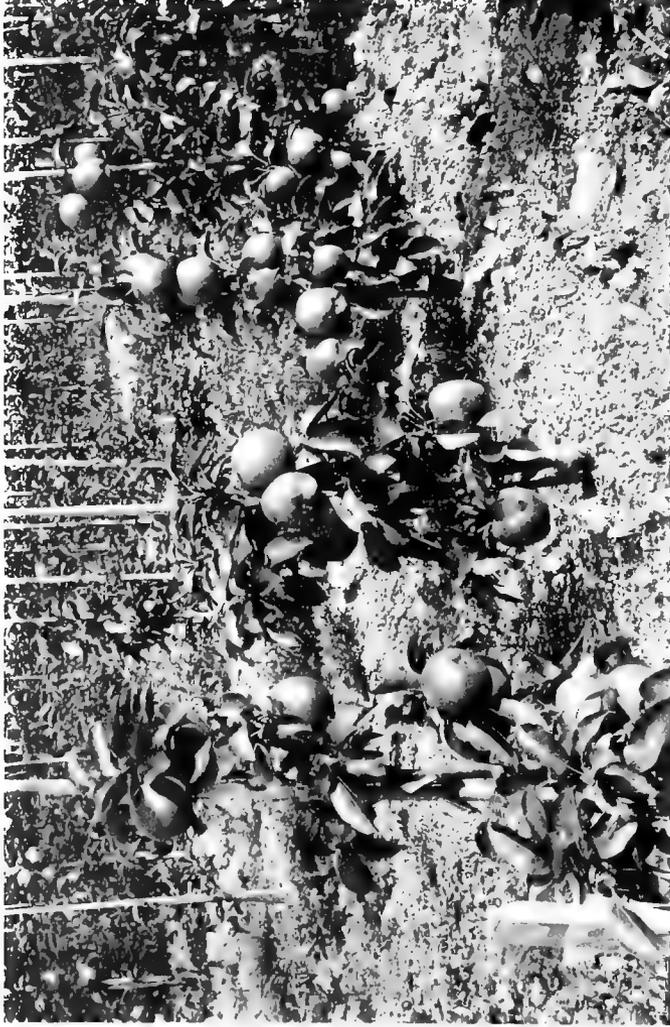
THE HUNDRED BEST APPLES

ADAM'S PEARMAIN, T.—*Skin*, slightly rough and dry; *ground colour*, bright yellow with coppery red, striped deeper red, spotted and patched with russet; *flesh*, tender, greenish white; *stalk*, set in starry russet basin; *flavour*, sweet and rich, first-class; *season*, November to January; *growth*, compact, moderate. A pretty, high-coloured dessert variety, worthy of a place in a select collection. It is often more pointed than the figure. Of average fertility.

ALFRISTON, K.—*Skin*, smooth; *colour*, pale greenish yellow netted with thin russet, flecks of green under the skin; *flesh*, tender, juicy; *flavour*, sweet and pleasant;



*RIBSTON PIPPIN APPLE TREE AT RIBSTON PARK, YORKSHIRE.
(A sucker from the original tree.)*



DWARF APPLE TREES. (*Beauty of Kent.*)

season, January to March ; *growth*, sturdy and compact, large drooping foliage. Forms a fine orchard tree and a fertile pyramid on the Paradise stock ; keeps sound for a long time ; does well on gravelly soil. Fruits must be left on the tree well into November or they shrivel. Of average fertility.

ALLEN'S EVERLASTING, T., F.C.C. 1901.—*Skin*, rough ; *ground colour*, greenish yellow covered with thin brown russet, coppery red on sunny side ; *flesh*, tender, yellowish tinged with green ; *flavour*, brisk, aromatic, first-class ; *season*, April to May ; *growth*, stout, upright, very full of spurs. Forms neat trees on the Paradise stock, and is a useful garden variety in any form. Fruit should be left on the trees as late as November to be perfect. A regular bearer.

ALLINGTON PIPPIN (South Lincolnshire Pippin), T., F.C.C. 1894.—*Skin*, slightly rough ; *ground colour*, yellow to primrose with scarlet flush, striped with deeper scarlet with slight russet and russet spots ; *flesh*, firm, very pale primrose ; *flavour*, rich, excellent, resembling Golden Reinette ; *season*, November to February ; *growth*, free, twiggy, and full of fruit-spurs. Makes a neat orchard standard, and is most desirable on the Paradise stock in any form. It bears so freely that it will require thinning, but not too much or the fruits become too large for dessert. It is one of the most beautiful fruits grown, and although only introduced in 1896 has already become popular. It is in season longer than Cox's Orange Pippin, and may be considered as one of the finest sorts sent out. Trees bear when one year old. The fruit is sometimes swollen near the stalk, and often conical.

ANNIE ELIZABETH, T. or K., F.C.C. 1866.—*Skin*, smooth, shining ; *ground colour*, bright yellow suffused with salmon red and striped with deeper red, faint russet round the eye ; *flesh*, very firm, crisp, and juicy, yellowish white ; *stalk*, very short, frequently knobby ; *flavour*, sweet and aromatic ; *season*, March-April ; *growth*, sturdy, upright, bold ; large foliage. Succeeds near the sea, and the fruit does not fall in windy weather. Late in the season it is fit for dessert. *Fertility* moderate.

BAUMANN'S RED WINTER REINETTE, T., F.C.C. 1878.—*Skin*, rough ; *ground colour*, bright orange almost entirely covered with rich bronzy red ; *flesh*, white, half tender ; *stalk*, set in thin russet basin ; *flavour*, sweet ; *season*, December to January ; *growth*, sturdy, irregular, full of spurs. Forms a neat orchard tree, and bears regularly and profusely, so much so as to pay for liberal thinning of the fruits. Suitable for all forms of garden trees on the Paradise stock. The fruits are a beautiful colour, and keep late. One of the very best for market culture on bush trees ; being so firm, it reaches market in good condition. The R.H.S. certificate was granted to it as a market fruit.

BEAUTY OF BATH, T., F.C.C. 1887.—*Skin*, rough, sometimes russety in places ; *ground colour*, pale yellow with bright crimson cheek and white spots, very pretty ; *flesh*, melting, greenish white ; *flavour*, pleasantly acid ; *season*, middle to end of July, August ; *growth*, compact, full of spurs. Forms a neat orchard tree, and succeeds on Paradise stock, and is amenable to any form of training. Ripens with Gladstone, and is one of the earliest July fruits, and thus valuable for dessert purposes. It pays for liberal treatment, and its colour is so bright that it fetches the best prices in the market.

BEAUTY OF KENT (Countess of Warwick, Seward of Worcester), K. or T., A.M. 1901 ; introduced about 1800.—*Skin*, smooth and dry ; *ground colour*, greenish yellow covered with brownish red, striped with bright red ; *flesh*, tender, and nearly white ; *stalk*, set in silvery russet basin ; *flavour*, sweet and slightly aromatic ; *season*, November to January ; *growth*, vigorous and spreading, apt to droop ; *foliage*, large and curled. A variety which is superb on warm soils under garden culture on the Paradise stock, but loses quality in cold or uncongenial soils. *Fertility* moderate.

BELLE PONTOISE, T. or K., F.C.C. 1902.—*Skin*, smooth and greasy ; *ground colour*, greenish yellow shaded with bronzy crimson, striped and flecked with darker crimson ; *flesh*, tender, very white, juicy ; *stalk*, set in russet basin $1\frac{1}{2}$ inches wide ; *flavour*, pleasantly sub-acid ; *season*, December to April ; *growth*, vigorous ; *foliage* very large. A grand variety for all purposes, sometimes very large, and always handsome and regular in outline. *Fertility* excellent.

BISMARCK (Prince Bismarck), K., F.C.C. 1887.—*Skin*, smooth, slightly greasy; *ground colour*, pale yellow, carmine red striped with deeper red, sometimes brilliant crimson; *flesh*, crisp, pale primrose, juicy; *stalk*, set in starry russet basin; *flavour*, pleasantly sub-acid; *season*, October to January; *growth*, rather spreading, leaves very downy. A valuable fruit, suitable for all methods of culture, and at the end of the season the smaller examples are fit for dessert; it can be sold for market from the trees. *Fertility* remarkable; never fails to crop freely; requires thinning to get perfect fruit.

BLENHEIM ORANGE (Woodstock Pippin), K., T.—*Skin*, rough and uneven; *ground colour*, golden yellow with russet in patches and dots, frequently striped and flushed with brownish red; *flesh*, tender, yellowish white, mealy; *stalk*, set in starry russet basin; *flavour*, rich and full; *season*, November to February; *growth*, vigorous, spreading; *foliage* broad and deep green. The best fruit for general use. The large examples, which take a more conical form, are splendid for dumplings and tarts, while the smaller are esteemed for dessert. Best as a standard, but amenable to garden culture when duly root-pruned, though the branches should not be too closely cut. *Fertility* abundant, though not before the tree has gained size and age.

BRADDICK'S NONPAREIL, T.—*Skin*, slightly rough; *ground colour*, deep yellow with ring of russet round the eye, patches of russet set over the fruit and round the stalk; *flesh*, white with green specks; *flavour*, sweet and aromatic; *season*, October to December; *growth*, compact, full of spurs. One of the very best for garden culture. Can always be recognised by the russet ring round the eye. Sometimes the fruit is flatter than shown in the figure. Forms pretty fruitful cordons. *Fertility* good.

BRAMLEY'S SEEDLING, K., F.C.C. 1883.—*Skin*, smooth, slightly greasy; *ground colour*, dull yellow with faint red streaks shading to brownish red; *flesh*, firm, juicy, white with greenish spots and streaks; *stalk*, frequently terminated by a knob; *flavour*, sub-acid; *season*, December to April; *growth*, sturdy, robust, spreading. A very valuable fruit for orchard and market culture. Its growth is very free, and consequently orchard trees do not bear fruit until they are about ten years old. The branches require carefully regulating and pruning, but when once fruit-spurs are formed the tree bears constantly. The fruit is of good size and keeps soundly, generally irregular, but often flatter than shown in the figure. The foliage is very large, flat, and rounded. It forms fertile bushes on the Paradise stock, but its vigorous growth does not lend itself to severe pruning or set training.

BROWNLEE'S RUSSET, T.—*Skin*, rough; *ground colour*, pale green suffused with russet all over, faintly brown on russet side; *flesh*, crisp, cream-coloured; *flavour*, very rich; *season*, November to January; *growth*, upright, compact and very full of foliage. This fruit is in its season one of the best dessert sorts for garden culture. *Fertility* moderate but regular. The fruit should not be gathered before it is ripe, or it shrivels, loses its fine flavour, and becomes tough. This variety is worth culture for its beautiful blossom alone. In the spring it is most striking, the flowers being highly coloured.

CALVILLE BLANCHE (White Calville), K.—*Skin*, dry; *colour*, greenish yellow with a few black spots and specks; *flesh*, tender and melting, primrose colour; *flavour*, sweet and slightly aromatic; *season*, December to April; *growth*, moderate, full of spurs. This French fruit is greatly esteemed by the cooks, and is, when grown on a wall or warm situation, suitable for dessert; it is, however, a very tender apple, and cannot be recommended for general culture.

CALVILLE MALINGRE, K., A.M. 1902.—*Skin*, slightly rough and dry; *ground colour*, pale orange frequently coppery crimson, striped with deep crimson; *flesh*, firm, greenish white with yellowish green markings; *flavour*, sub-acid; *season*, April, May; *growth*, upright, very compact, and full of fruit-spurs. A valuable apple for garden culture, making finely formed cordons and pyramids and a pretty espalier. Fruit must be left on the tree till November. *Fertility* first-class.

CALVILLE ROUGE PRECOCE (Summer Calville), T.—*Skin*, rough; *ground colour*, bright crimson marked with silvery and white russet dots; *flesh*, tender, white

with rosy markings; *flavour*, spicy and unusually aromatic; *season*, October to December; *growth*, neat and compact, rather upright. A beautiful fruit for decoration, and should be grown in every garden on the Paradise stock.

CALVILLE ROUGE D'HIVER (Red Calville), K., A.M.—*Skin*, smooth; *ground colour*, olive green flushed with deep blood red and crimson; *flesh*, very firm and pale green; *season*, April to May; *growth*, twiggy, spreading. A grand sort for very late use, worthy of planting against a west wall. When fully developed fit for dessert at its late season. A good cooker also. The fruits must be left on the tree well into November. *Fertility* remarkable, fruit requires thinning.

CARDINAL (Peter the Great), T., K., A.M. 1896.—*Skin*, dry and velvety; *ground colour*, pale primrose with exquisite marblings of red and rose like a peach; *flesh*, crisp, very white and crystalline; *flavour*, very sweet and pleasant; *season*, August to September; *growth*, upright, compact and full of spurs, never makes a large tree; worthy of culture in gardens for its beauty, bears abundantly; one of the most beautiful apples, carrying a bloom like a plum.

CELLINI PIPPIN (Selina), K.—*Skin*, smooth and greasy; *ground colour*, pale green, covered with silvery russet with red and crimson flecks and stripes; *flesh*, very tender and white; *stalk*, set in a green starry basin; *flavour*, pleasantly acid; *season*, August to October; *growth*, free and rather upright. One of the best for a cottage or villa garden; seldom fails to bear. Apt to canker in cold soils on the Crab, but trees worked on the Paradise stock are more healthy. *Fertility* abundant and constant.

CHELMSFORD WONDER, K., F.C.C. 1891.—*Skin*, smooth, slightly greasy; *ground colour*, pale lemon, pale bronze, with flecks of red; *flesh*, very firm, juicy, pale primrose colour; *flavour*, pleasantly sub-acid; *season*, December to February; *growth*, upright, compact. Valuable for orchard culture, for instance, where Wellington cankers. Keeps firm to the last, a valuable sort for garden trees on the Paradise stock. *Fertility* excellent.

CHRISTMAS PEARMAN, T.—*Skin*, rough and dry; *ground colour*, bright orange, marked with silvery specks and russet patches, dull crimson on sunny side, pale fruits are faintly striped only; *flesh*, crisp, pale primrose, green markings; *stalk*, set in a green slightly russet basin; *flavour*, rich and pleasantly sub-acid; *season*, November to December; *growth*, compact, full of spurs. A great bearer, forms a neat orchard tree. Introduced for market sale, but it has proved suitable for dessert when grown as a garden tree on the Paradise stock. Some of the fruits are knobby at the stalk and egg-shaped. It bears in clusters, and requires thinning freely.

CLAYGATE PEARMAN, T., A.M. 1901.—*Skin*, rough; *ground colour*, greenish yellow, covered with patches of silvery cinnamon, russet, and russet dots, often with a bronzy cheek; *flesh*, half-tender, creamy, with green markings; *stalk*, set in thin russet basin; *flavour*, very rich, first-class; *season*, January to March; *growth*, compact, spreading, twiggy. Leaves downy underneath. Resembles Ribston Pippin, and is one of the very best. Most suitable for garden culture in any form. *Fertility* excellent and regular. The fruits are often much higher on one side, and always uneven and irregular.

COCKLE'S PIPPIN (Nutmeg), T.—*Skin*, usually smooth; *ground colour*, orange yellow, netted and spotted with thin cinnamon russet; *flesh*, crisp, pale primrose; *flavour*, rich, sweet, and piquant; *season*, November to February; *growth*, compact and twiggy. In ordinary seasons the fruit is of a russet colour, but in some years it is often entirely green. One of the best for garden culture in any form on the Paradise stock, forms a small orchard standard. Fruit requires thinning as it bears in clusters of three and more. The fruit is often more pointed and smaller than in the figure.

CORNISH GILLIFLOWER (Gilliflower), T.—*Skin*, rough and dry; *ground colour*, pale orange, and bronzy red, striped with darker red; *flesh*, tough, cream-coloured; *flavour*, sweet, rich, and aromatic; *season*, October to January; *growth*, pendulous and slender, fruit produced at ends of branches. Its high flavour entitles it to a place in good gardens, where it is best as a standard or half-standard, and if somewhat hard pruned

it becomes very fertile, but left alone it is a shy bearer. The fruit is so sweet that it requires to be protected from birds as it approaches ripeness. *Foliage* small. The fruit is often swollen at the stalk, and almost egg-shaped.

COX'S ORANGE PIPPIN, T. ; introduced 1854.—*Skin*, slightly rough ; *ground colour*, rich orange, bronzy red, sometimes scarlet on the sunny side ; *flesh*, tender, cream-coloured ; *stalk*, set in russet basin ; *flavour*, rich, sweet and pleasant ; *season*, November to April ; *growth*, twiggy, but free, forms spurs readily. Undoubtedly the very best dessert apple. How long it will keep depends largely upon the fruit room ; its season may be lengthened by gathering at several pickings, and by placing trees in various aspects ; in Scotland it requires a wall. Bearing freely, there is no better sort than this for market culture as a bush on Paradise stock ; in congenial (not cold) soils it forms a neat orchard tree. The figure is made from a perfect specimen, but smaller fruits are more globular. One characteristic of this fruit is that even in badly grown examples, the white spots show under the skin.

COX'S POMONA (Pomona), K., T.—*Skin*, smooth and greasy ; *ground colour*, bright yellow covered with carmine red, streaked with deeper red ; *flesh*, very tender, white and crystalline ; *stalk*, set in yellow basin ; *flavour*, sweet and pleasant ; *season*, October and November ; *growth*, compact. When fully ripened, excellent for dessert. The branches require to be well thinned, as also does the fruit. Succeeds well in cool soils. *Fertility* first-class and constant. The blossom is snow white, very distinct.

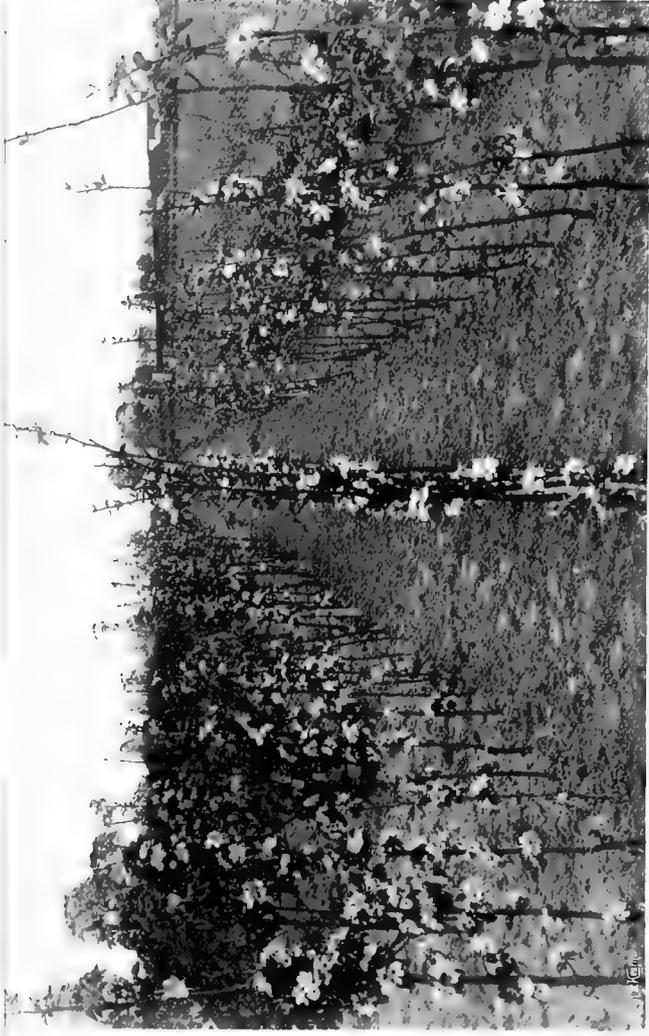
D'ARCY SPICE (Spring Ribston, Essex Spice, Baddow Pippin), T., A.M.—*Skin*, slightly rough ; *ground colour*, pea green, netted, and spotted with thin russet ; *flesh*, melting, white with green markings ; *flavour*, highly aromatic and pleasant ; *season*, February to May ; *growth*, very slow. In its native County of Essex there are large orchards of this tree, but it would be best to graft on established trees to get an early return. It forms sturdy bushes or pyramids on the Paradise stock, and should be grown in all gardens for a late supply ; its appearance condemns it as a market sort.

DEVONSHIRE QUARRENDEN (Seek no Farther, Striped Quarrenden, Waterloo Pippin, Sack Apple, Quarantine [of market]), T.—*Skin*, smooth and dry, but greasy when stored ; *ground colour*, pale yellow, but almost entirely covered with rich blood red ; *flesh*, crisp, very white, sometimes rosy under the skin ; *flavour*, brisk and piquant when fresh, juicy ; *season*, August to September ; *growth*, moderate. Forms a neat orchard standard, and garden trees on the Paradise stock produce splendid fruit. Valuable for the table, and has a high value in the market, where it is known as "Quarantine." Succeeds in all forms.

DUCHESS OF OLDENBURG (Borovitsky, Russian, Summer Peach), K., T.—*Skin*, smooth and dry ; *ground colour*, pale primrose, streaked and striped with bright crimson, very handsome ; *flesh*, crisp, brisk, and crystalline ; *flavour*, briskly acid, but not too much so for most palates ; *season*, August to September ; *growth*, upright, vigorous, but not so twiggy as many. A very fine apple for home use. Carries a fine bloom like a peach, is very hardy, succeeds in cold soils, and never fails to bear. It sells fairly well in the market because of its beauty, but it is apt to bruise on long journeys. The shoots of this variety are very deep brown.

DUKE OF DEVONSHIRE, T.—*Skin*, smooth ; *ground colour*, greenish yellow, with black dots and patches of russet, especially round the eye and stalk ; *flesh*, tender, white with green markings ; *flavour*, sweet and aromatic ; *season*, March to May ; *growth*, rather spreading and free. Ranks with the best. Makes a good standard, is suitable for garden culture. The fruit retains its flavour to the last, must not be gathered early. *Fertility* satisfactory and regular on established trees.

ECKLINVILLE SEEDLING, K.—*Skin*, smooth, shining, greasy after storing ; *ground colour*, greenish primrose with black dots, rarely with a crimson flush ; *flesh*, melting, white, and crystalline ; *flavour*, pleasantly acid ; *season*, September to October ; *growth*, vigorous, sturdy, and stout, forming a flat-headed orchard standard. This is one of the best early kitchen apples, and seldom fails to bear a heavy crop. The tree is full of fruit spurs, and grand in all forms. It is a first-class variety to graft the weaker dessert apples upon.



CORDON APPLE TREES IN NURSERY ROWS.



CORDON APPLE TREES IN A HEREFORDSHIRE NURSERY.

EGREMONT RUSSET, T.—*Skin*, rough ; *ground colour*, brownish orange entirely covered with cinnamon russet ; *flesh*, soft and leathery ; *flavour*, very rich and full ; *season*, October to November ; *growth*, upright, compact, and full of spurs. One of the richest late autumnal fruits, of a pretty colour, for dessert. Best on the Paradise stock. *Fertility* excellent.

EMPEROR ALEXANDER (Alexander, Grand Duc de Constantine), K., T.—*Skin*, smooth, slightly greasy ; *ground colour*, primrose or pale rose, marked with crimson stripes ; *flesh*, very tender, white ; *stalk*, set in greenish yellow basin ; *flavour*, sweet and vinous ; *season*, October and November ; *growth*, vigorous and spreading. When fresh the fruit is very good for table use, and cooks well also. One of the most beautiful fruits grown, often very large. *Fertility* excellent.

FEARN'S PIPPIN (Clifton Nonesuch), T.—*Skin*, rough and dry ; *ground colour*, primrose flushed with coppery red, and marked with white specks ; *flesh*, fairly tender, white, with yellowish green marks ; *stalk*, set in russet basin ; *flavour*, sweet and pleasant ; *season*, February to April ; *growth*, upright and compact, forms a neat standard. A first-class garden variety on the Paradise stock. *Fertility* excellent.

GASCOIGNE'S SCARLET SEEDLING (Glory of England), K., T., F.C.C. 1887.—*Skin*, smooth ; *ground colour*, primrose, flushed and spotted with rich carmine red on sunny side ; *flesh*, firm, very white ; *stalk*, set in a brown basin, frequently swollen ; *flavour*, sweet and pleasant ; *season*, November to January ; *growth*, spreading, inclined to weep. Perhaps the most beautiful apple grown, raised in Kent ; under orchard-house culture of remarkable beauty. Very valuable as a market variety, requires root-pruning and grafting on the Paradise stock. *Fertility* first-class, a regular bearer after it is established.

GOLDEN NOBLE (Beauty of Wilts, Gold Cup of Tasmania, Lord Clyde, John Peel), K., T.—*Skin*, slightly rough and dry ; *colour*, rich yellow all over ; *flesh*, crisp and juicy, yellowish white ; *stalk*, always surrounded by russet ; *flavour*, sweet and slightly aromatic ; *season*, November to January ; *growth*, spreading and weeping. Forms a fine orchard tree. It requires careful management as a garden tree on the Paradise stock, as it bears on the points of the shoots. Succeeds well in light gravelly soil. This variety may be always distinguished by its long bare shoots, often 18 inches without a spur. *Fertility* excellent and regular.

GOLDEN REINETTE (Reinette dorée), T.—*Skin*, smooth ; *ground colour*, deep yellow suffused with red on the sunny side ; *flesh*, pale yellow ; *stalk*, set in a shallow russet cavity ; *flavour*, sweet, rich and pleasant ; *season*, December and January ; *growth*, compact, very full of spurs. A grand old dessert sort for garden culture. Not unlike King of the Pippins. Fruit of even size. *Fertility* excellent.

GOLDEN SPIRE, K.—*Skin*, smooth, slightly greasy ; *colour*, bright canary yellow, unshaded ; *flesh*, crisp, juicy and tender, pale primrose ; *flavour*, sweet and pleasant ; *season*, October to December ; *growth*, upright, moderate, very full of spurs, an enormous bearer, and from its growth suitable for orchards. On the Paradise stock it makes a perfect tree, and never fails to bear so heavily that thinning becomes a necessity. Many who like an acid apple use it for dessert. The colour of the fruit renders it easily saleable in the market, and the tree succeeds all over the country, being hardy and free from canker. The fruits are often more pointed than the figure, and smaller. The flowers of this variety are very beautiful, small, pink on the inside, and shaded with carmine on the outside.

GRAVENSTEIN, K.T.—*Skin*, slightly rough and greasy when stored ; *ground colour*, bright yellow streaked with dull crimson, sometimes flushed with crimson ; *flesh*, very crisp and juicy, almost transparent ; *stalk*, sometimes swollen ; *flavour*, pleasantly sub-acid ; *season*, September from the trees, keeps to December when stored ; *growth*, spreading. There are many old trees of this in the country ; the fruits are suitable for dessert as picked from the tree, and are also excellent for jelly. The fruit is generally higher on one side, and often not so regular as shown in the figure. The tree should not be pruned heavily for garden use. It makes large thin branches, and is well suited for a standard. *Fertility* regular, but moderate.

GRENADIER CODLIN, K., F.C.C. 1883.—*Skin*, smooth, seldom greasy; *colour*, pale greenish yellow shading to pale yellow; *flesh*, soft, cooks well; *flavour*, briskly acid; *season*, end of September and October; *growth*, free, compact; forms fine orchard trees and most valuable bushes for garden or market purposes on the Paradise stock. A splendid bearer, never fails to crop, considered the best of the Codlins. A good, handsome fruit.

HAMBLING'S SEEDLING, K., F.C.C. 1893.—*Skin*, smooth and dry; *colour*, creamy yellow with faint tinge of brown, and russet round the eye; *flesh*, tender, crisp and juicy, pale primrose colour; *stalk*, set in green basin; *flavour*, pleasantly sub-acid; *season*, December to March; *growth*, very sturdy and free. One of the best late apples, very heavy and firm; it cooks well. The tree is not fertile till it gains size and age, and should not be hard pruned as a garden tree. It forms a grand orchard tree. *Fertility* excellent when established.

HEREFORD CRIMSON QUEENING (Crimson Quoining, Red Stubbard, Quoining), T.—*Skin*, smooth; *ground colour*, orange yellow, deep crimson on sunny side with splashes of red; *flesh*, tender and very white; *stalk*, enlarged at entry, set in red basin; *flavour*, aromatic and pleasant, loses flavour when stored; *season*, October and November; *growth*, irregular, full of spurs. Its bright colour renders it a useful market apple, and its peculiar flavour is much liked by some; it must not be stored for long. It forms a compact orchard tree and a pretty garden tree on the Paradise stock. *Fertility* excellent.

HORMEAD PEARMAIN (Arundel Pearmain), K., T., A.M. 1900; introduced 1885.—*Skin*, smooth; *colour*, bright yellow, faintly spotted russet; *flesh*, firm, white with green stripes; *stalk*, set in russet basin; *flavour*, slightly acid; *season*, December to May; *growth*, compact and sturdy. A variety that seldom fails to bear. Tree is useful in any form. The fruits keep quite firm very late. They are often more conical than the figure, and of regular outline. *Fertility* constant and abundant.

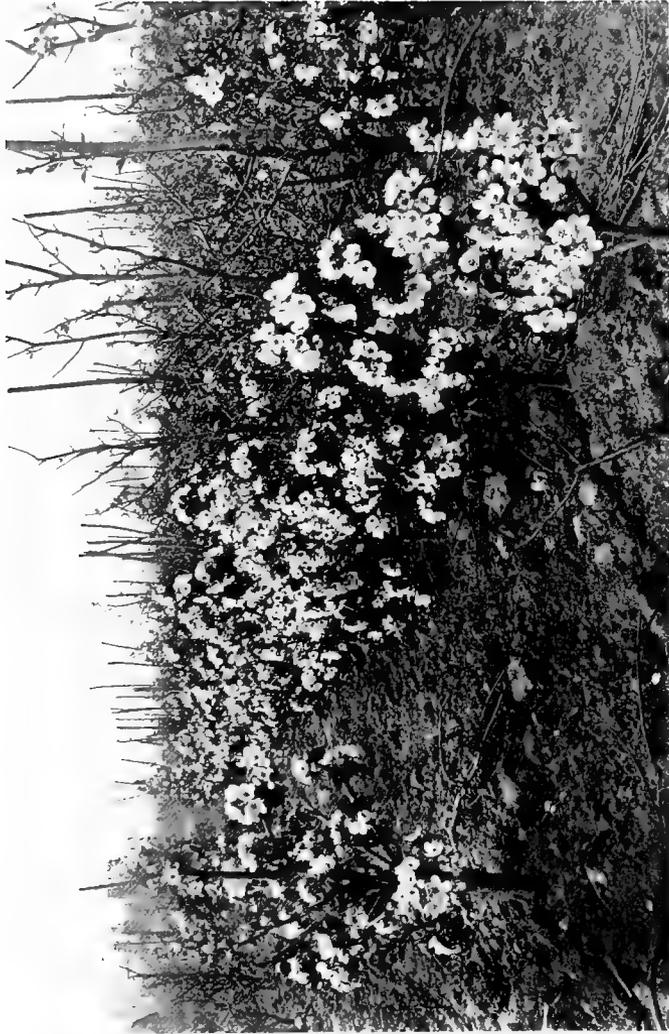
HUBBARD'S PEARMAIN (Russet Pearmain), T.—*Skin*, smooth; *ground colour*, greenish yellow suffused with faint crimson, marked with irregular russet patches and dots; *flesh*, tender, greenish white; *stalk*, set in a green basin; *flavour*, very rich and full; *season*, December to January; *growth*, compact. A valuable sort for culture on the Paradise stock in any form.

IRISH PEACH (Early Crofton), T.—*Skin*, rough, greasy if stored; *ground colour* greenish yellow striped and flushed with bronzy red, and dotted white; *flesh*, soft, melting, greenish; *flavour*, spicy and rich; *season*, early August; *growth*, pendent; bearing at the end of slender branches, therefore should be little pruned. It is best to let this and all early apples fall by themselves upon a straw mulching. The fruits are often flatter and more irregular than the figure.

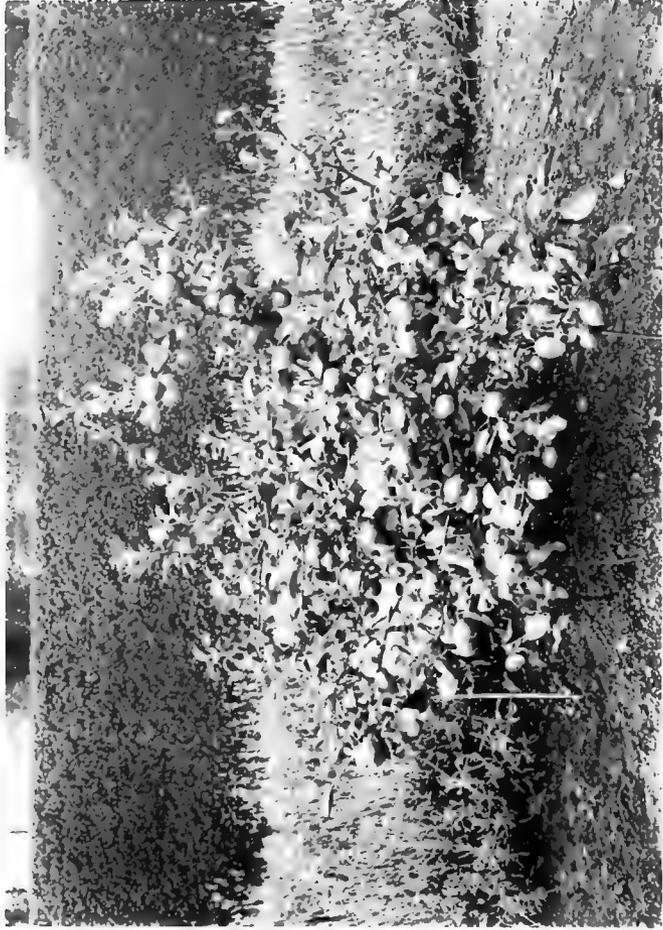
JAMES GRIEVE, A.M. 1897.—*Skin*, smooth, greasy; *ground colour*, bright primrose striped deeper red, with white spots and patches of russet; *flesh*, very tender and melting, and nearly white; *stalk*, set in faintly russet basin; *flavour*, sweet and pleasant; *season*, September and October; *growth*, moderate and rather upright. An introduction from Scotland of great value, it may be described as an early Cox's Orange Pippin. The tree is very healthy and succeeds in the north, forming a valuable addition to our early autumn varieties. Best as a garden tree on the Paradise stock. *Fertility* excellent.

KERRY PIPPIN, T.—*Skin*, smooth; *ground colour*, dull yellow marked with brownish red, striped and spotted with deeper red; *flesh*, firm, dull and cream-coloured; *stalk*, very frequently swollen; *flavour*, first-rate; *season*, September; *growth*, compact and twiggy. Forms a neat garden tree on the Paradise stock, and is a favourite with those who like a crisp and sweet fruit. Not suitable for a standard, and too small for a cordon. Fruit sometimes very nearly round, often knobby at the stalk.

KESWICK CODLIN, K.—*Skin*, rough and greasy when stored; *colour*, pale greenish yellow; *flesh*, melting, white; *flavour*, briskly acid; *season*, August and September; *growth*, compact and much branched. A well-known old fruit, which is valuable for cold soils where better fruits do not succeed; requires thinning to perfect its heavy crops.



DWARF APPLE TREES IN FLOWER.



APPLE LANE'S PRINCE ALBERT AS A BUSH TREE.

KING'S ACRE PIPPIN, T., A.M. 1897.—*Skin*, rough; *ground colour*, brownish orange splashed with silvery russet over brownish red cheek; *flesh*, tender, greenish yellow and juicy; *flavour*, brisk, aromatic with a tinge of acidity; *season*, March to April; *growth*, moderate and compact. A fine addition to late fruits. Suitable for garden culture on the Paradise stock. *Fertility* good.

KING OF THE PIPPINS (Brayton Hall, Golden Winter Pearmain, Pike's Pearmain, Prince's Pippin, Winter Pearmain), T.—*Skin*, smooth; *ground colour*, bright orange marked with brownish red and crimson on sunny side; *flesh*, mealy and tender, pale primrose; *stalk*, set in greenish basin; *flavour*, pleasantly sweet; *season*, October to January; *growth*, upright, compact, very full of spurs. A favourite market apple and a great and constant bearer. Apt to canker on cold soils, though reliable on the Paradise stock. Suitable for all sorts of training. There are a great many seedlings of this variety in the country, and only the best forms should be cultivated. It is the custom in Kent orchards to prune this sort heavily and feed liberally, which treatment it well repays when the fruits are put on the October market.

KING OF TOMPKINS COUNTY (Tompkins), T., K., A.M. 1900.—*Skin*, smooth and shining; *ground colour*, deep yellow covered with carmine red on sunny side, striped with deeper carmine; *flesh*, firm, creamy white; *stalk*, set in an orange basin; *flavour*, very rich; *season*, November to April; *growth*, spreading; *foliage*, dark green. One of the best American sorts for culture in Britain. Fruit from trees on Paradise stock is brilliantly coloured and first-class in flavour. May succeed as a standard in the best soils and positions; is worthy of a wall with a western aspect.

LADY HENNIKER, T., K., F.C.C. 1873.—*Skin*, rough and harsh; *ground colour*, pale orange, coppery red, striped with deeper shade; *flesh*, firm and mealy; *stalk*, thin, set in russet basin; *flavour*, sweet, rich and vinous; *season*, December; *growth*, upright, compact; *foliage*, large, downy. A first-class fruit for home use. Makes a fine orchard tree, and is one of the best sorts for Christmas dessert. *Fertility* moderate.

LADY SUDELEY, T., F.C.C. 1884.—*Skin*, rough; *ground colour*, pale orange striped with deep red on coppery red ground, frequently bright crimson; *flesh*, very tender, creamy-red under the skin; *flavour*, unusually vinous and aromatic, highly perfumed; *season*, August and September, must be eaten from the tree; *growth*, compact, inclined to weep. The finest autumnal apple for dessert. Succeeds in all forms, and on Paradise stock is remarkable for its lovely fruits. These lose flavour when stored, as all early apples do. The tree should be closely pruned for a few years, and then only partially cut back, as it bears on the points of the shoots. *Fertility* first-class.

LANE'S PRINCE ALBERT (Prince Albert), K., F.C.C. 1881, introduced 1870.—*Skin* smooth; *ground colour*, primrose and green, rosy red on sunny side splashed with deeper red; *flesh*, crisp, greenish white; *stalk*, set in a greenish basin; *flavour*, briskly sub-acid; *season*, November to April; *growth*, moderate, covered with fruit-spurs. One of the most valuable apples, retaining its freshness to the last. Bears very freely, and being of pendent growth is valuable for grafting on old trees. It does not make a stout standard, but as a plantation tree on the Paradise stock it bears enormously. The branches should be thinned and kept open. It is grand as a cordon, or in fact in any garden form.

LORD BURGHLEY, T., F.C.C. 1865.—*Skin*, rough; *ground colour*, golden, flushed, and slightly striped with deep bronzy red, covered with thin russet and whitish spots; *flesh*, firm and greenish; *stalk*, set in russet basin; *flavour*, sweet, rich, and aromatic; *season*, February and March; *growth*, compact. The fruit is of grand flavour, and one of the best late sorts for garden use. On the Paradise stock it makes a pretty cordon. *Fertility* excellent.

LORD DERBY (London Major), K.—*Skin*, smooth; *colour*, entirely bright yellow; *flesh*, tender, crystalline; *stalk*, set in a greenish basin; *flavour*, sweet and pleasant; *season*, November and December; *growth*, upright, sturdy; *foliage*, large and downy. One of the most valuable market and garden fruits; of excellent cooking quality, and when fully ripe fair for dessert. Succeeds in all forms and makes a grand espalier and close, upright standard. *Fertility* remarkable, it never fails to bear a fine crop.

LORD GROSVENOR, K.; introduced 1875.—*Skin*, harsh, greasy; *colour*, bright

canary yellow; *flesh*, melting and snow-white; *flavour*, briskly acid; *season*, August and September; *growth*, sturdy and compact, upright, a wonderful bearer in any form. Thin freely as it fruits in clusters; even if the crops are reduced by two or three pickings the remaining fruits will be very large. A market apple of first quality, and valuable for all garden purposes.

LORD SUFFIELD, K.—*Skin*, smooth, greasy; *colour*, very pale primrose; *flesh*, melting, snowy white; *flavour*, pleasantly sub-acid; *season*, August and early September; *growth*, moderate. Apt to canker as an orchard tree; requires a warm, stony soil; one of the finest kitchen apples on the Paradise stock. The flowers are immense and of a beautiful pale pink colour.

MANNINGTON'S PEARMAN, A.M. 1901.—*Skin*, rough; *ground colour*, pale green marked with patches of russet, or brownish red marked with spots and striped deep red; *flesh*, tender and melting, pale cream marked with green; *stalk*, set in greenish russet basin; *flavour*, rich and sugary; *season*, November to February; *growth*, compact and twiggy. Forms a neat orchard standard, and as a garden tree on the Paradise stock it adapts itself to all forms of training. *Fertility* good.

MARGIL, T.—*Skin*, slightly rough; *ground colour*, orange yellow, covered with patches of russet, flushed crimson and striped deep crimson; *flesh*, fairly tender, greenish white; *stalk*, frequently knobby; *flavour*, rich and spicy; *season*, October and November; *growth*, compact, twiggy. A grand old fruit of small size, evidently one of the parents of Cox's Orange Pippin. Grand on Paradise stock for garden use in all forms, and makes a very compact standard. *Fertility* abundant and regular.

MÈRE DE MÉNAGE, K., T.—*Skin*, smooth; *ground colour*, brownish orange almost covered with deep bronzy red, striped with dark crimson; *flesh*, tender, white with faint green markings; *stalk*, set in brown smooth basin, often swollen; *flavour*, sweet and aromatic; *season*, December and January; *growth*, free and spreading. Forms a noble orchard tree, and bears freely when ten years old. Fruits from trees on the Paradise stock are very large and handsome. Not suitable for a cordon or espalier, but best as a free bush. Cooks and bakes well and has a fine flavour; slightly red-fleshed when cooked. The fruit is often angular, and deeper than the figure. *Fertility* regular.

MOTHER APPLE, T.—*Skin*, slightly rough; *ground colour*, bright yellow suffused with red, marked with crimson on the sunny side; *flesh*, tender, milk-white with green markings; *stalk*, often ending in a knob and set in a russet basin; *flavour*, very rich; *season*, October; *growth*, compact; *foliage*, shining green. One of the richest flavoured apples in its season; even in the north, where it does not colour so brightly, it is yet of excellent flavour. Makes a close standard, and adapts itself to all forms of garden trees on the Paradise stock. *Fertility* excellent. The fruit is often more oval than in the figure.

MR. GLADSTONE (Jackson's Seedling), T., F.C.C. 1883.—*Skin*, slightly rough, greasy when ripe; *ground colour*, greenish yellow, with dull red patches and marked with broad streaks of deeper red; *flesh*, tender, melting, greenish white; *stalk*, often knobby; *flavour*, very brisk, spicy, and pleasant; *season*, middle of July to end of August; *growth*, compact and twiggy. Forms a neat orchard tree, and adapts itself to all forms of garden trees on the Paradise stock. The fruit figured is rather small; it often has a knobbed stalk, and is pointed. *Fertility* excellent.

MRS. PHILLIMORE, T., A.M. 1899.—*Skin*, dry and harsh; *colour*, primrose and russet, and almost covered with dull red; *flesh*, greenish white, tender; *stalk*, short; *flavour*, very sweet and pleasant, perhaps the sweetest apple grown; *season*, November to February; *growth*, compact, upright, short-jointed, forming fine cordons and garden trees on the Paradise stock. Very fertile, and quite an addition to winter dessert sorts.

NEWTON WONDER (Pearson's Newton Wonder, Taylor's Newton Wonder), K., F.C.C. 1887.—*Skin*, smooth and dry; *ground colour*, brownish yellow with patches of russet, frequently crimson with black dots; *flesh*, firm, greenish white with green veins; *stalk*, frequently swollen, set in a green basin; *flavour*, pleasantly sub-acid; *season*, November to May; *growth*, vigorous, spreading, with bold foliage. A most desirable late sort; forms grand orchard trees, spreading bushes or pyramids on the Paradise

stock; makes a good espalier, but is not suitable as a cordon. Worthy of extensive culture. Quite pleasant to eat late in the season; all the fruits are well formed and of good size. They are often flatter than shown in the figure and without the knob. This is a variety far more reliable than Wellington, and equally good when cooked. *Fertility* first-class.

NORMAN'S PIPPIN (Pomme Grise), T., A.M. 1900.—*Skin*, rough and dry; *ground colour*, pale greenish yellow, flecked and spotted with russet, especially round the eye; *flesh*, crisp and white; *stalk*, frequently knobby; *flavour*, sweet, rich, and pleasantly aromatic; *season*, December to February; *growth*, free, rather upright. The origin of this apple is obscure, but it was received as named, and is one of the best for garden use on the Paradise stock. Makes pretty cordons. *Fertility* excellent.

NORTHERN GREENING (Cowarne Queening, Walmer Court, Winter Greening), K.—*Skin*, smooth; *ground colour*, greenish yellow, in a warm season marked with stripes and flushes of red; *flesh*, crisp, white, and juicy; *stalk*, very short, frequently knobby; *flavour*, briskly acid; *season*, February to April; *growth*, upright, full of spurs. A valuable old late sort for cold soils and orchards; pays well for storing; a valuable sauce apple; bears well every other year. The fruit is sometimes more oval than shown in the figure. The New Northern Greening does not succeed well in the south.

OLD WINTER NONPAREIL, T.—*Skin*, dry and harsh, shiny in places; *ground colour*, russet green, almost entirely covered with thin silvery russet, pale copper cheek; *flesh* very brisk, richly flavoured, spicy; *season*, January to May; *growth*, wiry. Forms a close standard and a neat pyramid or bush on the Paradise stock. One of the best late sorts; fairly prolific; good for cordons.

PEASGOOD'S NONESUCH, K.T., F.C.C. 1872.—*Skin*, smooth; *ground colour*, pale orange striped with crimson on a russety red ground; *flesh*, tender, greenish white; *stalk*, set in a green cavity; *flavour*, sweet and pleasant; *season*, October to December; *growth*, spreading, foliage and flowers very large. The largest and most handsome apple grown. It is apt to cast its fruits, for many are often maggoty. It cannot be called a market apple, although good prices are made with selected examples tastefully packed; but as a garden tree in any form, and especially upon a west wall, it is worthy of culture for decorative purposes alone. A fruit will weigh sometimes 26 oz. *Fertility* very moderate.

POTT'S SEEDLING, K.—*Skin*, smooth and very greasy; *colour*, bright yellow all over; *flesh*, crisp, snowy, cooks well; *flavour*, slightly acid; *season*, August and September; *growth*, very upright and compact, forming good trees on the Paradise stock, but is liable to canker in damp soils or if thickly planted. A fine apple for small gardens. Its large flowers are very distinct in colour before they open, being of a deep cerise.

REINETTE DU CANADA (Canadian Reinette), K.T., A.M. 1901.—*Skin*, rough; *ground colour*, greenish yellow with patches and spots of russet all over; *flesh*, mealy, tender, greenish primrose; *stalk*, set in a russet basin; *flavour*, very rich; *season*, December to March; *growth*, very upright and spreading. A very good garden fruit; on cordons it attains a large size, and although apt to shrivel it retains its flavour. *Fertility* fair.

RED JUNEATING (Early Red Margaret, Margaret), T.—*Skin*, slightly rough, greasy when stored; *ground colour*, ochre yellow suffused with dull red, sometimes crimson; *flesh*, tender, melting, pale greenish white; *flavour*, sweet and aromatic, but brisk; *season*, end of August and September; *growth*, compact, very twiggy. Crops well every other year, and trees on the Paradise stock produce pretty fruits. The fruit is often more conical than shown in the figure.

RIBSTON PIPPIN, T.—*Skin*, rough; *ground colour*, orange yellow, more or less covered with patches of russet and dotted white, brownish red on sunny side in a warm season, but frequently entirely covered with rough russet; *flesh*, leathery, cream colour; *stalk*, set in a greenish basin; *flavour*, very highly developed, spicy; *season*, November to February; *growth*, spreading, leaves very downy underneath. This old favourite is still in demand for garden culture, and trees worked on the Paradise stock are less

affected by canker than those on the Crab stock. Suitable for all forms of garden trees, but it does not pay as an orchard fruit. *Fertility* moderate. This is a very valuable fruit; in the warm seasons of 1899-1900 many examples were entirely free from the russet usually characteristic. The fruit is not always so irregular round the eye as shown in the figure.

ROSEMARY RUSSET, T.—*Skin*, slightly rough; *ground colour*, yellow flushed with rosy copper and entirely covered with netted russet; *flesh*, leathery; *flavour*, rich and aromatic; *season*, December to March; *growth*, moderate, forms a neat orchard standard and bears regularly. Garden trees succeed in all forms on the Paradise stock. The flowers are very large, of a faint blush colour.

ROSS NONPAREIL (Carey Pippin), T.—*Skin*, rough; *colour*, yellow, almost entirely hidden by a coat of thin russet and bronzy red, striped crimson; *flesh*, tender, nearly white and mealy; *flavour*, distinct, spicy, and rich; *season*, October to December; *growth*, twiggy, weeping as a standard. One of the best garden sorts on the Paradise stock; succeeds in all forms. *Fertility* first-class; requires some thinning, as the fruit comes in clusters.

ROUNDWAY MAGNUM BONUM, T., K., F.C.C. 1864.—*Skin*, slightly rough; *ground colour*, pale canary yellow, striped with red and bronzy red; *flesh*, firm and white; *flavour*, rich and aromatic; *season*, December to January; *growth*, free and spreading, with large downy foliage. One of the richest and best of all dessert apples. It forms large orchard standards and fine bushes on the Paradise stock, but, because of its free growth, is not so useful for cordons or espaliers. The fruits are apt to fall as they develop. When ripe they are often immense and too large for dessert, but are of splendid quality baked or in tarts, and the smaller fruits can be used for dessert. Its good quality in a great measure compensates the grower for a small crop. Large fruits are angular.

ROYAL JUBILEE, GRAHAM'S (Bunyard's Jubilee); introduced at Queen Victoria's first jubilee, K.—*Skin*, dry and harsh, greasy after storing; *colour*, bright golden; *flesh*, tender, cream-coloured; *flavour*, second-rate; *season*, October to February; *growth*, sturdy and vigorous, *wood* nut-brown. Forms a compact orchard tree, but grows slowly. Does well in the Midlands, but introduced as a market fruit, and, because of its colour, sells well. Very free from canker, and blossoms so late that it bears every year; requires thinning, as the fruits are produced in clusters.

ROYAL LATE COOKING, K., T., A.M. 1896.—*Skin*, smooth and shining; *colour*, orange yellow marked with faint russet; *flesh*, firm and juicy, cream-coloured; *stalk*, set in greenish basin; *flavour*, rich and pleasant; *season*, February and March; *growth*, free, rather spreading. Although described as a kitchen fruit, it is suitable for dessert late in the season. It resembles very much both Bedfordshire Foundling and Diamond Jubilee as certificated in March 1901. Suitable for bush or espalier culture, but not for cordons. *Fertility* average.

SANDRINGHAM, K., T., F.C.C. 1883.—*Skin*, smooth and dry; *ground colour*, dull yellow, brownish red flecked with crimson; *flesh*, firm and juicy, greenish white; *stalk*, set in starry greenish russet basin; *flavour*, pleasantly aromatic; *season*, January to March; *growth*, upright and compact. A valuable late cooking sort, and useful also for dessert at the end of its season. Forms a neat upright garden tree on the Paradise stock, and a compact orchard standard. *Fertility* excellent. Smaller fruits are much more conical than shown in the figure, and sometimes of uneven shape. The flowers are a beautiful soft pink, shaded darker outside.

ST. EDMUND'S PIPPIN, T., F.C.C. 1875.—*Skin*, rough; *ground colour*, cinnamon yellow almost entirely covered with russet, suffused with silvery russet; *flesh*, rather leathery, faint buff-coloured; *flavour*, very rich; *season*, October and November; *growth*, compact and full of spurs. A very fine russet apple for autumn use; does best as a garden tree. The fruit is sometimes larger and flatter than shown in the figure.

SANSPAREIL, T., K., F.C.C. 1900.—*Skin*, smooth and dry; *ground colour*, lemon yellow shaded rosy red, with carmine stripes and flecks; *flesh*, firm, juicy, pale cream-

coloured; *flavour*, sweet, brisk, and spicy; *season*, February to April; *growth*, free, compact, with many spurs. Forms a pretty garden tree on the Paradise stock in all forms, and a neat orchard standard; free from canker. A valuable late fruit, keeps firm, and is good enough for dessert. *Fertility* very good; fruits must be thinned, or they will be small. Some fruits are more conical than shown in the figure.

SCARLET NONPAREIL (Introduced 1700), T., A.M. 1900.—*Skin*, slightly rough; *ground colour*, dull yellow flushed with reddish brown, with white dots and patches of thin russet; *flesh*, pale primrose with faint green markings; *stalk*, frequently swollen; *flavour*, very rich, sweet, and piquant; *season*, January to April; *growth*, compact, upright and twiggy. *Foliage* long, narrow, green beneath; *wood*, chocolate-coloured, and with bright silver dots. One of the best garden apples for all forms of trees. Some fruits are deeper than others.

SEATON HOUSE (Niton House), K., T.—*Skin*, smooth and greasy; *ground colour*, bright yellow striped with faint red; *flesh*, tender, white; *stalk*, set in starry russet basin; *flavour*, pleasant; *season*, October and November; *growth*, compact, covered with spurs; fruit buds often form in the axils of the current year's growth. Most suitable as a garden tree on Paradise stock in all forms. Bears most freely and regularly, and requires thinning. A good sort for small gardens. *Foliage* bright green, narrow, sharply pointed.

STIRLING CASTLE, K.—*Skin*, smooth and greasy; *colour*, creamy white; *flesh*, tender, snowy white, crystalline; *flavour*, sub-acid; *season*, September and October; *growth*, compact. Weeps with the weight of fruit, and therefore not suitable as an orchard standard. One of the best apples for small gardens as a bush or free pyramid. It is a valuable market fruit, and pays for severe thinning. *Fertility* remarkable; never fails. The flowers of this variety are very handsome, and last a long time in beauty. When the bronzy young foliage begins to appear, a lovely contrast results.

STONE'S APPLE (Loddington Seedling), K., F.C.C. 1877.—*Skin*, rough and greasy, *ground colour*, greenish primrose with faint red stripes and markings; *flesh*, firm, white; *flavour*, rich, sweet and spicy; *season*, September to December; *growth*, sturdy and spreading; very full of spurs. This variety is very often grafted on old trees, and does remarkably well. The fruit is very large, and can be sold from the tree or stored. On the Paradise stock this apple forms most fruitful bushes; it is one of the best dumpling apples, and very good as a dessert fruit. Sometimes more pointed than shown in the figure.

STRIPED BEAUFIN (Beefing), K., T.—*Skin*, slightly rough; *colour*, greenish yellow with flecks of russet round the eye, faint red on the sunny side, splashed deep crimson; *flesh*, firm, greenish white; *stalk*, set in a russet basin; *flavour*, rich and pleasant; *season*, November to February; *growth*, very vigorous and spreading. Forms a large orchard tree and a fruitful bush on the Paradise stock, but is not suitable as an espalier or cordon, as the spurs are so far apart. Late in the season it is an excellent sort for baking. *Fertility* moderate.

STURMER PIPPIN, T.—*Skin*, smooth; *ground colour*, pea-green, frequently covered with bronze on sunny side; *flesh*, firm, greenish white; *stalk*, set in a green and deep depression; *flavour*, brisk and piquantly spicy; *season*, March to June; *growth*, compact and twiggy. One of the best late garden apples, and worthy of a wall in cool climates. The fruits must be left on the trees well into November, or they shrivel when stored and lose that crisp flavour which should be their characteristic. Fruits are so freely produced as to require thinning.

SUMMER GOLDEN PIPPIN (Yellow Ingestrie), T.—*Skin*, smooth; *colour*, entirely orange yellow, faintly spotted; *flesh*, tender, yellowish; *flavour*, sweet and pleasant; *season*, September; *growth*, slender and pendulous, very wiry. *Foliage* small, oval, sharply pointed. *Flowers* very small and numerous, of a purer white than any other variety. A valuable apple for the north, and a profitable market fruit. *Fertility* first-class and constant.

THE QUEEN (Saltmarsh's Queen), K., F.C.C. 1880.—*Skin*, smooth and slightly greasy; *ground colour*, greenish lemon with broad stripes of red and rosy-red; *flesh*, very tender, white; *stalk*, set in a greenish basin; *flavour*, sweet and pleasant; *season*, October to December; *growth*, spreading and free. *Foliage* pale green, flat,

shining, regularly oval, hoary beneath. Often of dessert quality, and one of the hand-somest fruits grown. Forms a large spreading orchard tree and a wide bush on the Paradise stock. Not suitable for cordons. *Fertility* moderate.

TOWER OF GLAMIS (Bess Pool [of Kent], Carse o' Gowrie), K.—*Skin*, very smooth and slightly greasy; *colour*, bright canary yellow, with few brown dots; *flesh*, firm, juicy, and yellowish white; *stalk*, set in a green basin; *flavour*, sweet and brisk, *season*, from October to December; *growth*, stout, free, and spreading. *Foliage* round, dark green, very broad and bold. A valuable sort for all methods of culture. One of the heaviest bearers known. The fruits do not readily fall in windy weather. Cooks well. *Fertility* excellent. This fruit varies considerably, and is often one-sided and more conical than shown in the figure.

WAGENER, K.—*Skin*, smooth; *ground colour*, bright yellow, and salmon red, striped carmine and red; *flesh*, crisp and juicy, whitish; *stalk*, very deeply set; *flavour*, spicy and quince-like; *season*, April to June; *growth*, compact, sturdy, and full of spurs. *Foliage*, bright green, shining; *wood*, nut-brown. From America. One of our best late garden sorts; fruits can be left on the tree till November, and keep firm to the last. Although little known, such a valuable bearer is worthy of note, even in a hundred. *Fertility* remarkable.

WALTHAM ABBEY SEEDLING (Dr. Harvey), K., T.—*Skin*, smooth; *colour*, rich yellow; *flesh*, very tender, white and mealy; *flavour*, sweet, rich, and pleasant; *season*, November and December; *growth*, compact and twiggy. A valuable orchard fruit tree, which is a regular bearer when once the tree is of good size and age, but not suitable for garden culture, as severe pruning removes the fruit-spurs. A favourite dessert fruit with many. A splendid baking sort, which does not "fall" in cooking.

WARNER'S KING (D. T. Fish, Irish Giant, King), K.—*Skin*, smooth and dry; *colour*, greenish yellow, rarely with scarlet flush; *flesh*, soft and white; *stalk*, set in a russet basin; *flavour*, sub-acid; *season*, October and November; *growth*, vigorous, spreading; *foliage*, very large, reflexed. This is the largest apple grown, and has scaled 32 ounces in Kent. A very valuable garden fruit for culture on the Paradise stock and as a free bush, but its vigour makes it unfit for an espalier or cordon. As a market fruit it sells freely; it also cooks well. The tree is liable to canker in cold soils, and should not be too severely pruned. Forms a spreading orchard tree.

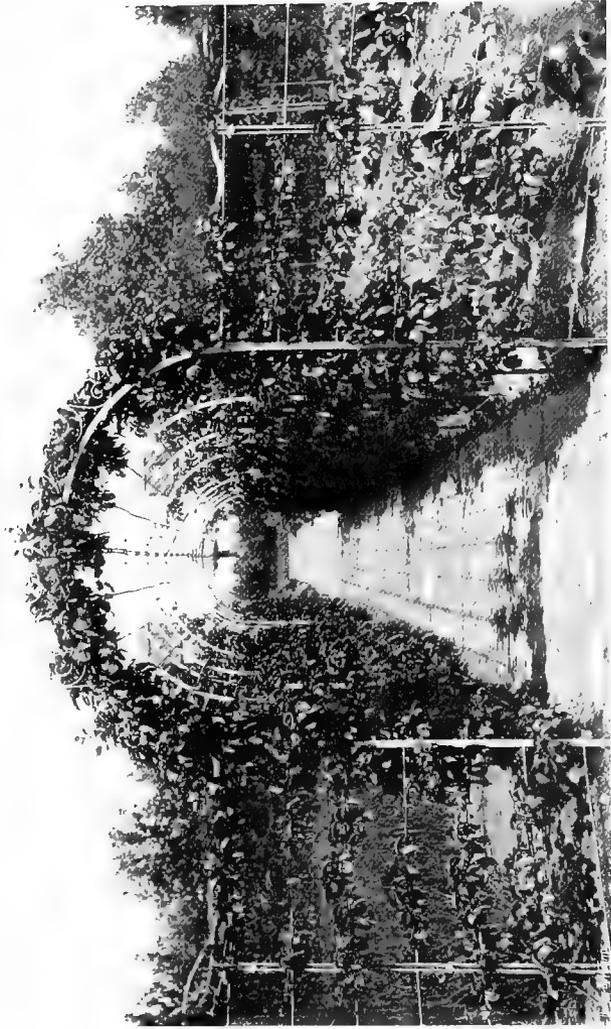
WEALTHY, T., F.C.C. 1893.—*Skin*, smooth, slightly greasy; *ground colour*, pale orange striped round the eye with crimson, deepening in colour towards the base, where it is striped with very dark crimson; *flesh*, tender, creamy white; *flavour*, rich and sweet; *season*, October and November; *growth*, upright, spreading as it gets size. Valuable for decoration alone, but esteemed by many for its tender flesh, and one of the few American sorts that succeed well in Britain. Not suitable for orchard culture, but most useful on the Paradise stock in all forms. *Fertility* excellent. The fruit nearly always hangs downwards, and is therefore most highly coloured round the stalk.

WELLINGTON (Dumelow's Seedling, Normanton Wonder), K.—*Skin*, smooth: *ground colour*, creamy white and bronzy red, sometimes scarlet with crimson dots and stripes and black specks; *flesh*, firm and juicy, greenish white; *stalk*, slightly russet, frequently swollen; *flavour*, slightly acid; *season*, December to March; *growth*, compact, rather weeping, twiggy. *Foliage*, moderate in size, shining bright green; shoots much marked with silver dots and spots. The best apple for cooking; the tree is not quite hardy, and suffers during very severe frosts. From a garden tree on the Paradise stock the fruit is much improved, but Newton Wonder and Bramley's Seedling are preferable for orchard culture. Its market repute, however, is high. Bears well every other year. A great favourite in the kitchen, as the flesh becomes nearly transparent and has a refreshing acid flavour when cooked.

WHITE NONPAREIL, T.—*Skin*, rough; *colour*, greenish yellow, almost covered with dull cinnamon russet; *flesh*, leathery, greenish white; *flavour*, sweet and aromatic; *season*, December and January; *growth*, neat and compact. A valuable garden fruit for culture on the Paradise stock; bears freely in any form.



CORDON ESPALIER APPLE TREES BY GARDEN PATH.



AN APPLE WALK IN THE GARDENS AT OVERSTRAND

WHITE TRANSPARENT (Early Transparent), K., T., A.M. 1895.—*Skin*, dry and harsh; *colour*, palest primrose; *flesh*, crisp, very white, almost transparent near the core; *flavour*, briskly sub-acid and suitable for dessert; *season*, early August, sometimes middle of July; *growth*, upright and free. Forms most prolific trees on the Paradise stock; bears fruit in clusters. Good as a cordon. Quite first-class for cooking. Forms an upright orchard standard, and bears when quite young so freely as to require thinning. Many prefer it as a dessert fruit. Very handsome. Sometimes more one-sided and conical than shown in the figure.

WINTER QUEENING (Sussex Duck's Bill).—*Skin*, rough and harsh; *ground colour*, dull yellow with bronzy red cheek striped with bright red, and often crimson all over, with patches of thin russet and many dots; *flesh*, mealy, dull greenish yellow; *flavour*, sweet, rather rich and pleasant; *stalk*, set in a greenish basin; *season*, February to April; *growth*, forms a large spreading orchard tree and a prolific bush on the Paradise stock. *Foliage*, shining, downy beneath.

WORCESTER PEARMAIN, T., F.C.C. 1875.—*Skin*, smooth; *ground colour*, orange yellow, almost entirely covered with deep crimson; *flesh*, tender, whitish; *stalk*, set in russet basin; *flavour*, sweet and pleasant; *season*, September; *growth*, upright and compact. A very profitable market apple, brilliant colour. Useful for orchards and plantations, as its upright growth allows of dwarf bush trees being grown beneath. Finest fruits are had from trees on the Paradise stock. It is a favourite with many for the table and for decoration. *Fertility* first-rate. Fruits require to be thinned, as they are produced in clusters. Sometimes more pointed than shown in the figure. The flowers of this variety are very distinct, being quite white inside, salmon pink and yellow outside.

SELECTIONS OF APPLES FOR SPECIAL PURPOSES

EIGHT BEST APPLES FOR SMALL GARDENS

DESSERT.

Mr. Gladstone July, August	Cox's Orange Pippin . . . Oct., Nov.
Lady Sudeley September	Cockle's Pippin Christmas

COOKING.

Pott's Seedling Aug., Sept.	Bismarck Nov., Dec.
Stirling Castle. October	Lane's Prince Albert January

The above are regular bearers, succeed in any form, and require very little pruning.

BEST APPLES FOR LARGER GARDENS

DESSERT.

Mr. Gladstone July, August	Allington Pippin Dec., Jan.
Devonshire Quarrenden August	Ribston Pippin Oct., Nov.
Lady Sudeley September	Cockle's Pippin Christmas
Margil October	Old Nonpareil. Dec., Jan.
King of the Pippins. November	Claygate Pearmain January
Cox's Orange Pippin Oct., Nov.	Lord Burghley February
Mother " "	Sturmer Pippin March, April
Egremond Russet December	Allen's Everlasting " "

THE FRUIT GARDEN

BEST APPLES FOR LARGER GARDENS (*continued*)

COOKING.

Early White Transparent	August	Tower of Glamis	December
Pott's Seedling	Aug., Sept.	Golden Noble	"
Ecklinville Seedling	October	Lane's Prince Albert	January
Stirling Castle	October	Wellington	"
Warner's King	November	Bramley's Seedling	"
Lord Derby	Nov., Dec.	Alfriston	February
Blenheim Orange	" "	Newton Wonder	"
Bismarck	" "	Northern Greening	March

APPLES FOR CORDONS

DESSERT.

Mr. Gladstone	August	Adams' Pearmain	December
Devonshire Quarrenden	"	Hubbard's Pearmain	Nov., Feb.
James Grieve	September	Allington Pippin	Jan., Feb.
Wealthy	October	Scarlet Nonpareil	January
Margil	"	Norman's Pippin	February
King of the Pippins	"	Lord Burghley	"
Mother	October	Duke of Devonshire	"
Calville Rouge Precoce	"	Rosemary Russet	"
Cox's Orange Pippin	Oct., Feb.	Sturmer Pippin	Very late
St. Edmund's Pippin	November	Allen's Everlasting	"
Ross Nonpareil	"	Fearn's Pippin	"

COOKING.

Duchess of Oldenburg	August	Lord Derby	November
Pott's Seedling	September	Bismarck	December
Lord Grosvenor	"	Lane's Prince Albert	Jan., March
Lord Suffield	"	Sandringham	February
Grenadier	Sept., Oct.	Alfriston	Feb., March
Golden Spire	" "	Calville Malingre	Feb. to March
Seaton House	" "	Calville Rouge	" "

PROFITABLE APPLES FOR MARKET

(Grown on Paradise Stock as Bushes)

DESSERT.

Beauty of Bath	July, August	Cox's Orange Pippin	Nov., Feb.
Red Quarrenden	" "	Beauty of Barnack	November
Lady Sudeley	September	Allington Pippin	Dec., Feb.
Worcester Pearmain	Sept., Oct.	Gascoigne's Scarlet	December
Yellow Ingestrie	September	Christmas Pearmain	"
Duchess' Favourite	Sept. to Oct.	Winter Quarrenden	"
King of the Pippins	October	Baumann's Reinette	January

PROFITABLE APPLES FOR MARKET (*continued*)

COOKING.

Early White Transparent	July	Lord Derby	Oct., Nov.
Lord Suffield	Aug., Sept.	Stone's Apple	" "
Pott's Seedling	" "	Tower of Glamis	" "
Lord Grosvenor	" "	Warner's King	" "
Early Julien	" "	Bismarck	Nov., Dec.
Ecklinville Seedling	Sept., Oct.	Lane's Prince Albert	Dec., March
Grenadier	" "	Bramley's Seedling	" "
Stirling Castle	" "	Newton Wonder	" "
Golden Spire	" "		

(Grown as Orchard Standards)

DESSERT.

Beauty of Bath	August	Cox's Orange Pippin	Nov., Feb.
Devonshire Quarrenden	September	Allington Pippin	" "
Duchess' Favourite	End of Sept.	Blenheim Orange	" "
Worcester Pearmain	September	Gascoigne's Scarlet Seed-	
King of the Pippins	October	ling.	Dec., Jan.
Col. Vaughan	Sept., Oct.		

COOKING.

Lord Grosvenor	Aug., Sept.	Bismarck	December
Lord Suffield	" "	Blenheim Orange	Nov., Feb.
Grenadier	" "	Wellington	Jan., March
Golden Spire	October	Newton Wonder	" "
Warner's King	November	Bramley's Seedling	" "
Tower of Glamis	" "	Northern Greening	" "
Lord Derby	" "	Winter Queening	Feb., April
Waltham Abbey Seedling	Nov., Feb.		

APPLES OF RECENT INTRODUCTION

These may after trial prove to be useful additions.

BARNACK BEAUTY.—A conical, highly coloured fruit, valuable for market sale. November. A.M. 1899.

BEN'S RED.—A scarlet fruit, like a late Quarrenden; for market sale. October. A.M. 1899.

BIELO BORADAWKA.—A large fruit, after Duchess of Oldenburg, but of sweeter flavour, and larger. A great bearer.

BOW HILL PIPPIN.—A large fruit of Blenheim Orange type; very pleasant flavour.

BYFORD WONDER.—A large late, green fruit, after Warner's King. F.C.C. 1898.

CHAS. ROSS.—A very handsome fruit. Cox's Orange Pippin × Peasgood's Nonesuch. F.C.C. 1899.

THE FRUIT GARDEN

EARLY VICTORIA.—A very free-bearing Codlin from Wisbech, resembling Lord Grosvenor.

GOLD MEDAL.—A very large, flat Codlin. A better sort is found in Grenadier (which see).

LANGLEY BEAUTY.—A pretty, early fruit, with flavour of Mr. Gladstone. August. A.M. 1898.

LORD HINDLIP.—A richly flavoured dessert fruit, after Cornish Gilliflower (which see), and of like weeping habit.

NORFOLK BEAUTY.—A fine large yellow fruit. A free-bearing Waltham Abbey cross that is most promising. A.M. 1901.

ONTARIO.—A long-keeping kitchen apple, quite sound in May and June.

PAROQUET.—A scarlet market fruit, like Barnack Beauty. A.M. 1899.

PRINCE EDWARD.—A russety March fruit with scarlet blotches. A.M.

VENUS' PIPPIN.—A very free-bearing early fruit, local in Torquay. A.M.

WILLIAMS' FAVOURITE.—A little known, dull red, September fruit. Good bearer. A.M.

WINTER QUARRENDEN.—A deep red-coloured November-December fruit. A valuable late market variety. A.M. 1898.

APPLE, THE CUSTARD (see p. 207).

CHAPTER II

THE APRICOT

By OWEN THOMAS

WHEN one realises that this valuable fruit has been with us for a matter of nearly four hundred years, having been introduced into Britain from Italy by Wolf (gardener to King Henry the Eighth), in the year 1524, it does seem incredible that its merits, especially as an article of commerce, have not been more fully recognised, and its great possibilities in this direction more developed. We cannot here shelter ourselves under the plea that the climate of France (from where ten times as many apricots as we grow are exported to Britain) is so much better suited to the growth of this fruit tree than that of England. The contrary is the case, and if further proof is needed it is to be found in the fact that English-grown apricots, if delivered in good condition, realise in the market at least 20 per cent. more than do the French, yet as an article of commercial value this fruit has received scarcely any attention, nor have its possibilities in this way been turned to practical use by our horticulturists. As one item that goes to make up the importance of the minor industries associated with the land in this country, the apricot, I am well convinced, is deserving of more serious consideration.

A wall with a warm aspect is necessary to grow it to perfection. Where walls are non-existent, I should certainly not recommend expensive brick ones to be built for this purpose; but what I would recommend to those who wish to make money out of their gardens is to plant an apricot tree against every available inch of warm wall they may have about their premises, whether it is a wall of the house in which they live, or the buildings by which this is surrounded. I may say that it has been proved beyond doubt, and the fact is now generally admitted, that in the south of England there are miles of garden walls planted with varieties of pears, that would succeed much better planted out in open quarters than against warm walls. They might well make room for the more remunerative apricot. The hardy variety "Breda" will succeed well as a bush or standard in warm and sheltered positions in the open garden in the south of England, and deserves to be more extensively cultivated in this way. Before the trees are planted the borders should be deeply trenched and well manured, in order to be able to maintain not only the vigour and fertility of the fruit trees, but also the surface crops, such as early vegetables and salads.

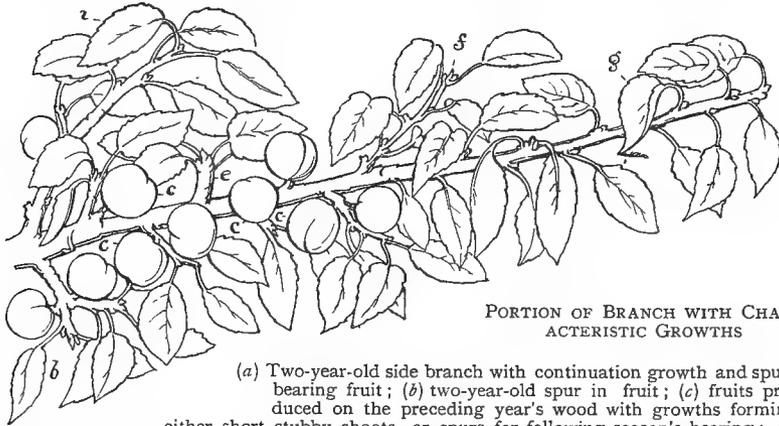
PLANTING.—The apricot is supposed to be a native of Armenia, and, like the peach, loves all the natural heat and light we can give to it; therefore,

where possible, it should have a position on a wall facing south, south-east, or south-west, or even on a wall with a west aspect it will prove satisfactory. It will not thrive against a wall facing east; in this position I have found that it suffers more damage from frost when in bloom than in any other. The apricot also loves warm soil, and it goes without saying that the border in which it is planted must be well drained, and the nature of the soil not too heavy and close. Where the latter is the case, old brick and mortar rubble, road scrapings, leaf-mould, or, in the absence of any of these, clean river sand will be useful for adding to the soil. This refers particularly to clayey soil or that which has not been well cultivated; generally, it may be said that the apricot will succeed in any well-cultivated garden soil, giving preference to that which is of a holding rather than of a light texture. Such is the nature of the soil in the Royal Gardens at Frogmore, where the trees bear heavy crops regularly.

As all those know who have had anything to do with the apricot, the greatest trouble one has to contend with is the unfortunate constitutional weakness it is subject to of losing many of its main branches, often in a most unaccountable way. This, unfortunately, is a trouble for which no remedy has yet been found. Neither, so far as I know, has any satisfactory and conclusive reason been given as to the cause of the mischief; many attribute it to injury to the bark by bruising with the hammer at nailing time, or to an accidental cut with a knife, or to severe autumn frosts. I do not think it is possible effectually to stamp out this tendency of the apricot to disease, but I do believe it is possible to mitigate its ravages considerably by timely attention to root-pruning during the first few years of its existence. In nine cases out of ten it is the strongest branches that die first, and this fact to my mind clearly points to the remedy. Gross shoots are produced by gross roots, therefore careful root-pruning must be resorted to for the first few years, indeed, until the tree is able to produce regular and heavy crops of fruit, thereby preventing these gross shoots by finding a more profitable channel for the tree's energies in maturing its crops of fruit. This is my experience, that if one can prevent the strong growths from appearing during the first four or five years, until the tree has attained a fruitful size, much will have been done to secure immunity from this trouble, certainly for many years.

TRAINING AND PRUNING.—The usual, and I think the best method of training the apricot, is in the form of a fan (fan-shaped), whether the tree is a dwarf or a standard. The distance apart I recommend apricot trees to be planted is 14 feet between the dwarf ones with a standard tree between. This will perhaps be considered by many to be too short a distance between the trees, but bear in mind that a young tree only costs a few shillings, and that the sooner you can cover a wall with fruitful trees the better. When the trees meet, every other may be taken out and planted somewhere else, or disposed of in some other way, as well-trained healthy trees of this age soon find a good market. As regards planting and root-pruning for the first season, the instructions given for the treatment of the young peach tree should be followed. The subsequent treatment as regards pruning is somewhat different

from that advised for the peach, because a larger number of main branches must be introduced; indeed, the tree will be wholly composed of main branches, and instead of laying in small shoots which issue from the latter, as advised in the case of the peach, they must be shortened back to three buds to form fruit-bearing spurs along the whole of the main branches. The spurs should be formed on the upper side of the branch, and should be from 4 to 6 inches apart. These will be permanent, and as time goes on the number of shoots on a spur will be added to by each year's growth, and to prevent their becoming too numerous, disbudding will have to be resorted to in spring. As a rule, only two or three growths on a spur should be allowed. In time the spurs will become large and ungainly, extending far from the branch, and it will be necessary to cut them off altogether. Younger growths will



PORTION OF BRANCH WITH CHARACTERISTIC GROWTHS

(a) Two-year-old side branch with continuation growth and spurs bearing fruit; (b) two-year-old spur in fruit; (c) fruits produced on the preceding year's wood with growths forming either short stubby shoots, or spurs for following season's bearing; (d) spur forming a cluster of blossom buds with a wood bud at apex; (e) shoot that may be either pinched or trained in to fill vacant space; (f) side branch; (g) continuation of branch.

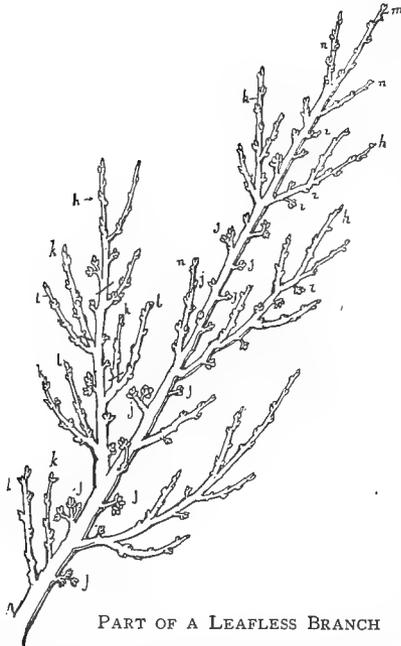
replace them, and the appearance of the tree will in time by this process be much improved. This work must be carried out with caution, and only a few of the old spurs should be cut away at a time, otherwise much of the crop will be sacrificed for a year or two. Any vacant spaces between the branches can be filled by nailing or tying in the previous year's shoots in their entirety.

THINNING THE FRUITS.—If fine well-developed fruits for dessert are desired, thinning must be done freely, for the apricot, as a rule, sets its fruits abundantly; one fruit to each spur will be sufficient, but if the intention is to grow apricots for preserving, then three may be left for a full crop. A healthy apricot tree is as capable of bearing a heavy crop of fruit without injury as any fruit tree. The thinning should be carried out not all at once, but on two if not three occasions: the first, soon after the fruits are set, when they are the size of small peas, and then only the smallest should be picked; the second, when the fruits have reached the size of hazel nuts (they are then useful

for tarts); and in about a fortnight's time they should be finally looked over to see that not more are left on the trees than these can mature without injury.

SUMMER TREATMENT.—As regards this, the apricot does not give much trouble, especially if disbudding has been carefully attended to, for when heavily cropped the growth of foliage is not excessive. Stop the lateral growths at the sixth or seventh leaf, and tie in or nail the terminal shoots; these, so long as there is any portion of wall to furnish, should be laid in and secured without any shortening whatever. When a good crop is assured, a mulching of well-decayed manure should be applied to the roots for 2 feet from the wall.

This not only prevents the border from becoming dry, but it will help the trees very materially to develop and mature a heavy crop of fruit by means of the manurial ingredients washed down to the roots by rain. Frequent waterings should be given during hot dry weather while the fruits are swelling. As soon as the crop is gathered, the soil about the roots should be thoroughly watered, so as to recoup the wasted energies of the tree after the ordeal of maturing a heavy crop, and diluted stableyard manure should be given. Two or three light dressings of nitrate of soda in the course of the season will be found of great advantage to the developing fruit; during the summer look over and regulate the growth of the trees. As a rule if a good crop has been produced there is very little superfluous growth to be removed. Should there be any, August is the time to remove it, so that the remaining shoots may have the advantage of full exposure for the rest of the season. When, after fruiting, the trees have been once well watered it is best as



PART OF A LEAFLESS BRANCH

(*h*) Side branches; (*i*) spurs on two-year-old (preceding season's) wood; (*j*) spurs on more than two-year-old wood; (*k*) two-year-old wood cut out, after bearing, at the cross lines to a successional shoot, as the finest apricots are produced on wood of the preceding year's formation; one side branch is shortened back, often necessary to prevent crossing and encroaching on neighbouring branch; (*l*) shoots of one year's growth for the succeeding year's bearing; (*m*) terminal or continuation growth; (*n*) growth trained in for filling vacant space, or furnishing tree, as well as for fruiting the following season; the lower side of branch and the side branches there are shown properly pruned and trained.

a rule (unless the season is exceptionally hot and dry) not to give them more; the rainfall will supply all that is necessary afterwards.

INSECT ENEMIES.—The apricot tree suffers as little or even less perhaps from insect pests than any other hardy fruit tree, *scale* being its greatest enemy. *Red spider* will sometimes make its appearance in very hot seasons and will attack the trees, especially if these are carrying a heavy crop, or suffering from

insufficiency of water overhead and at the roots. The cause here suggests the remedy, namely, water, which should be liberally and promptly applied, and then no harm will result.

PROTECTING THE BLOSSOM.—The apricot being the earliest to bloom of any of our hardy fruit trees, expanding its flowers in February and March, a season of the year when they are often exposed to most winterly and inclement weather, some protection to them is imperative in order to secure a full crop. Where the usual coping of board or glass with tiffany blinds (on rollers) exists, which can be lowered to cover the wall in front of the trees, no better protection can be had. Where this provision does not exist, I should not recommend the grower to go to the expense which the erection of these structures entails, as I believe the end in view can be accomplished quite as successfully by substituting herring nets for the tiffany. In the case of the coping and tiffany there is not only the primary cost, but the subsequent cost in unfolding and fastening these blinds every night, as well as the work entailed every morning in rolling them up again. Herring nets, if suspended (double or treble thickness) against the wall will answer equally well, and these may remain from the time they are fixed until they can safely be removed, therefore giving little or no trouble, and costing very little in the first place. The blossoms of the apricot withstand from five to seven degrees of frost without injury, without protection of any kind excepting that of the wall, and it is astonishing how effectively protected the bloom is even by the most simple and flimsy material. I ought to say that, in suspending the nets, care must be taken not to allow them to rest upon the trees or the flowers; they must be distant at least a few inches from the latter, and this is best secured by placing rough stakes or poles against the wall for the nets to rest upon.

THE APRICOT UNDER GLASS

It is only on a limited scale that the apricot has hitherto been grown under glass in this country for dessert, the reason being, I suppose, that for this purpose it has not been sought after so much as the peach and the nectarine, and also for the reason that the tree is not so amenable to treatment under glass as most of our other hardy fruit trees, particularly when grown as an orchard-house tree in a pot. Fair success may be obtained by this method of cultivating the apricot, but it is necessary to take great care, especially when the trees are in bloom; a free circulation of air is then absolutely necessary to secure "a good set of fruit"; a high temperature in the house is very injurious. A glass-covered wall or a house is usually made use of when the apricot is grown under cover, and when treated in this manner the quality, size, and flavour of the fruits are greatly improved. One peculiarity of the apricot must be noted before it can be successfully grown under glass, viz. that the trees must not be forced in the early stages of growth. The late Mr. Ewing, of Bodorgan, Anglesea, used to devote one of his then famous glass walls to apricot culture, and succeeded very well; but not at first, when the attempt was made without fire heat, because of the condensed moisture that gathered in the house, and which, at the time of year when the trees were in bloom in

the moist climate of Anglesea could not be removed, and consequently the blossoms used not to set well. However, this difficulty was removed by having a flow and return hot-water pipe, which was never used excepting when the trees were in bloom, and then always with as much dry air as could be admitted.



CHARACTERISTIC GROWTH WITH SIDE SHOOTS
PINCHED

- (o) A side shoot pinched at fifth leaf from base, the object being to keep bearing wood near branch and limit growth to space at command; laterals are pinched to one or two leaves; (p) terminal growth of a leafless branch; (q) a side shoot, leafless, pinched similarly to o; (r) spurs, the rounded buds are blossom buds, the pointed (terminal) ones are wood buds; (s) wood buds; (t) blossom buds.

of course, before closing. In this way ripe fruit can be had three weeks or a month before it is ripe out of doors. Quality and flavour are so much improved when the apricot is grown under glass that a house or two devoted to its culture should be included in every good garden.

VARIETIES.—The following are recommended for culture under glass:—*Frogmore Early*, *New Large Early*, *Grosse Pêche*, *Oullin's Early*, *Shipley's*, *Moor Park*, *Hemskerck*, *Large Early*, *Powell's Late*, *Large Red*.

VARIETIES

By GEORGE BUNYARD

Varieties of apricots in many cases closely resemble each other, although the trees differ in growth and foliage.

BREDA.—Rather large, richly flavoured. Tree hardy and a good bearer. This apricot succeeds in many spots as a standard tree.

Good crops were afterwards secured, although from my experience of the apricot it does not bear so freely under glass as it does out of doors. The best example of this system of culture was once to be seen at Welbeck Abbey, the seat of his Grace the Duke of Portland, where a great extent of glass-covered walls was devoted to apricot culture. The important points to remember for the successful cultivation of this fruit under glass are: keep the house fairly cool at all times; do not use fire heat except when the trees are in bloom, and then only in conjunction with as much air as can be safely given, remembering that the atmosphere of the house—at least for a few hours in the day—should be dry, when the flowers should be fertilised by being gently brushed over with a camel-hair brush or a rabbit's tail. When a crop is secured, and the final thinning is over, the fruits may be forced by closing the house in the afternoon, but not too early, syringing,

EARLY MOORPARK.—An early variety of this esteemed apricot. Fruit rather smaller than Moorpark; flavour rich and sweet.

FROGMORE EARLY.—A good pale golden variety, of large size and excellent flavour. Flavour sweet and luscious. F.C.C.

GROSSE PÊCHE (Large Peach).—A large and handsome fruit, deep orange, marbled with a darker colour, and sometimes with chocolate spots. Very juicy, rich, and sweet. Perhaps the best grown.

HEMSKERK.—A robust variety of Moorpark, and one of the most reliable.

KAISHA OR SYRIAN.—Fruit rather small, but very freely produced. The flavour is very sugary and delicious; growth sturdy.

LARGE EARLY OR NEW LARGE EARLY.—Fruit large, rather pale in colour. A very hardy free bearer of vigorous growth. It is the first to ripen.

MOORPARK.—Fruit large, deep golden orange, with darker mottlings. Flesh melting, very juicy and rich, and of delicious flavour. One of the best.

OULLIN'S EARLY PEACH.—Fruit small but freely produced. When fully ripened the sweetest.

PRÉCOCE DE BOULBON.—A new large, early variety, quite an acquisition. Growth free and sturdy.

SHIPLEY'S OR BLENHEIM.—An excellent variety, large and handsome. It may best be described as an early Moorpark, as it ripens twelve days before this. Fruit of first-class flavour, and the branches of the tree are less liable to premature decay than others.

BANANA, THE (see p. 211).

CHAPTER III

THE BARBERRY

By GEORGE BUNYARD

THE only useful Barberry for garden purposes is the red-fruited. The fruit has an intensely acid flavour, but mixed with apples or other fruits in a tart is most delicious. For decorative use in the autumn the pretty scarlet fruits are most useful. The Barberry (*Berberis vulgaris*) will grow in any soil, and forms a strong bush about 8 feet high. There is a white-fruited variety and a seedless form, but these are not of garden interest. In nurseries the Barberry is propagated by seed, the best seedlings only being selected for sale. The purple-leaved Barberry is valuable only for its striking foliage.

BLACKBERRIES AND ALLIED FRUITS

These useful fruits give variety to the year's supply, and are valuable in the making of jam, jelly, and tarts. They require but little care in cultivation, and grow freely in any ordinary soil.

The best results are obtained from plants in rows 6 feet apart, the shoots being trained right and left, espalier style. The fruiting shoots can then be removed every season, and fresh sturdy growths laid in as they are produced for the following year's crop; some peg them down, and cut off the ends after August to strengthen the lower buds, which next year produce strong-flowering branches.

All the pruning necessary is to cut away the old fruiting wood, yearly, as with raspberries. When established all grow strongly, and the plants can be placed from 6 feet to 10 feet apart. The American sorts, as a rule, flower freely, but only fruit satisfactorily in a few positions, or in very favourable seasons.

PARSLEY-LEAVED BLACKBERRY.—This is the best of the blackberries for general culture. The fruit is very large, freely produced, and the foliage is handsome, the stems being of a rich colour also. It is *Rubus laciniatus*; in point of flavour it is not equal to the Wild Blackberry, which can be obtained from any British hedgerow, and well repays the care of good cultivation.

CUMBERLAND BLACKCAP, or the Whitewash Bramble (*Rubus leucodermis*).—This is a handsome plant, the stems being white. The fruit is small and black, and ripens before the wild blackberries.

EARLY KING is a large-fruited American variety which ripens early.

THE LAWTON is a large American variety.

LUCRETIA is suitable for culture in damp, boggy land. The black fruits are large and acid and resemble the Dewberry.



THE CULTIVATED BRIMBLE AT SLINFIELD MANOR, NEAR BISINGSTOKE.



THE LOGANBERRY.

WILSON JUNIOR is one of the best large American black sorts, and grows very freely.

THE WINEBERRY (*Rubus phoenicolasius*) is a strong climber and beautiful, even in winter the shoots are thickly covered with red, short spines; in summer the velvety foliage is conspicuous. The reddish fruits are produced freely in the autumn; birds are very fond of them. The berries are small, and when cooked have a pleasant, distinct flavour.

THE LOGAN BERRY is a vigorous grower, the shoots reaching 10 to 12 feet high in a season. Its handsome foliage is striking, and it gives an abundant supply of large red berries, which resemble raspberries before they are ripe. The Logan berry is an American hybrid between the blackberry and the raspberry. The flavour is rich when cooked. When used for dessert the fruits need to be fully ripe.

THE MAHDI.—This novelty is the result of a cross between Raspberry Belle de Fontenay and the Common Blackberry, and a valuable addition to hardy fruits. In habit of growth and foliage it somewhat resembles the blackberry, and the fruit ripens during the latter part of July and early August. The flavour is excellent, superior to that of the Logan berry. A.M. 1901.

CHECKER TREE

This *Pyrus* (*P. Torminalis*) is a tree not unlike the sycamore in growth, but the leaves are smaller, some $1\frac{1}{2}$ inch across and about 3 inches long, with small pointed lobes. It produces bunches of dull green-coloured berries.

In October these are gathered, and as they ripen they turn a russet brown, and possess a pleasant sub-acid flavour. They may be used for dessert, or they make a good jelly for serving with meats.

Although a British species it is not much known beyond the Weald of Kent, where the fruit is sold in fruiterers' shops.

There is a Continental variety differing from the one described. The true checker tree is raised from suckers, but is not an easy subject to bud or graft.

CHAPTER IV

THE CHERRY

BY GEORGE BUNYARD

THE county of Kent has long been celebrated for the quality of cherries which it produces, and in all probability they were first planted in this part of England, of which Cæsar speaks more favourably than of any other district which he visited. Some authors assure us that the cherry, which was brought into this country by the Romans, was lost in the Saxon period, and only restored by Richard Harris, fruiterer to Henry VIII., who brought it from Flanders, and planted it at Sittingbourne in Kent. This appears to be an error, as Gerarde says "the Flanders cherry tree differeth not from our English cherry tree in stature or in form." There is an account of a cherry orchard of 32 acres in Kent, which in the year 1540 produced fruit that sold in those early days for £1000, which seems an enormous sum, as at that period good land is stated to have let at one shilling per acre !

Few of our hardy fruit trees are more accommodating than the cherry. The cottager in his little garden may have it in the form of a bush, pyramid, standard, or as a single cordon against a fence or wall, and the amateur may have it in these forms also, as well as on espaliers, as recommended for pears. He may grow it successfully under glass, either planted out or in pots, and thus extend the season of this delicious fruit from early May to the middle of September by growing early, mid-season, and late varieties. As an orchard crop, where the soil and situation are favourable, few hardy fruits are capable of giving, on an average, a better cash return. As regards soil and situation, the sweet or dessert cherry succeeds in the southern and South Midland counties the best. It thrives well in rather an elevated position, where it has the advantage of light, good natural drainage, freedom from damp, immunity from frost when in flower, and the advantage of driving showers of rain in the early summer ; these not only refresh the trees, but keep the foliage healthy and clean. The above remarks refer more particularly to plantations or orchards. The soil in which the cherry succeeds best is strong, somewhat marly loam, of a fair depth, resting on a substratum of gravel or chalk ; where no chalk or lime is present in the soil, some must be added before success can be attained in the culture of the cherry, or, we may say, of any stone fruit.

The stock used for grafting all orchard cherry trees upon should be the common or wild black cherry. The Continental seedlings do not seem to be so hardy, but the British stock is suitable for all. We do not find any great advantage generally in using the Mahaleb stock for cherries, although it suits

the Duke and Morello cherries admirably. On the other hand, for pot culture or restricted pyramidal trees, we find that trees on the cherry stock regularly re-potted or transplanted are equally as good as those on the Mahaleb.

Cordons and small trees when young must be root-pruned in any case, for when free growth ensues, and shoots are pruned hard, this is apt to cause gumming, which may injure or destroy the trees. And we find that where cherries for orchards are budded low, the stems are more easily injured and liable to gum than when budded high on the wild cherry stock named. On the other hand, where cherries sometimes do not succeed on the cherry stock, they may be grown on the Mahaleb. Cherries are very liable to be called after local places, and in this way names have been needlessly multiplied. Fruit well cultivated in orchards differs considerably from the same varieties in starved, poorly treated land.

CHERRIES FOR ORCHARDS

For this purpose we have to choose comparatively few sorts, and such as will be profitable during a long series of years, for the life of a standard cherry tree may be a hundred years, except in the case of the Flemish and Kentish Reds, May Dukes, and like sorts. In planting a profitable cherry orchard place trees of the larger growing varieties at 36 feet apart, and plant between each either a Flemish, Morello, or May Duke variety; or, if the soil is suitable, a plum, or one of the smaller growing sorts of apples.

PRUNING.—The trees being planted according to the general directions given in a separate chapter, they must be duly staked. If the orchard is in grass land, and it is intended to run sheep or cattle among them, they should be cradled to protect them from injury, and then be allowed to grow one year without cutting back. We hold this to be very important. While admitting it to be true that with very careful attention they may be cut back when planted, we believe as a general rule it is far better to allow the trees one year's free growth. They then become established before any cutting back is done. Afterwards a yearly pruning to shape the trees is essential; but when well-disposed and regulated head and branches are formed, they may be left alone, merely removing any useless shoots and such as cross each other. The Flemish and Morello class require very little pruning. The Bigarreau and black cherries will need attention for three years after planting; but the Rivers' Early, Elton, and any sorts that have long, pendent shoots, almost a weeping habit of growth, will require attention for five or six seasons in order that the boughs may not be so low as to be in reach of sheep or cattle. And to aid them, they should be cut to a bud pointing *inwards* instead of to the usual outside bud, to form at first the desired basin-shaped tree.

VARIOUS POSITIONS.—In Kent it is usual to plant orchard cherry trees in hop fields, removing a hill of hops and planting a cherry. The hop requires liberal culture, and we cannot at all recommend this system, because the cherry trees grow too freely, and they are not only liable to injury from severe frost acting upon the unripe wood, but they make such slender growth that, when

the hop poles are removed, and the protection afforded by the growing hop crop is suddenly withdrawn, they are apt to be damaged by the autumn gales. The long boughs are so bent by the wind that they are strained at the base, and then gum and decay. We prefer cherry orchards to be formed on arable land which is not heavily manured, or in meadow land where the stems have 3 feet of ground around them clear of grass. In these positions a sturdy, hard growth is made, which can be well ripened before the winter, and when pruned produces such shoots as will form a sound tree. Again, when the trees are



FRUITING BRANCH WITH CHARACTERISTIC GROWTHS

- (*u*) Continuation of branch; (*v*) side shoots showing natural forking of extension branches annually; these, and the leading shoot, must not be shortened if required for forming branches, otherwise they should be pinched to form spurs; if left entire they will form fruit buds the first year with some wood buds interspersed (see leafless shoot on side); (*w*) fruit produced from blossom buds on preceding year's wood; (*x*) spurs on last year's wood on which fruit is produced the following summer; (*y*) two-year-old spurs fruiting. Shoot (one-year-old) on side; (*z*) wood buds; (*a*) blossom buds.

upon grass land, sheep should be kept in the orchards until the grass is quite short; then, if the sheep are fed on oil-cake or other rich food, the trees will benefit. Nothing is more injurious to orchard trees than to allow rank long grass to grow close to them, as it robs them of moisture and does much harm to the surface roots. Even old neglected cherry orchards, when the grass is cleared from around the stems, will respond astonishingly, and a grand return will be had from trees that appeared to be worn out.

VARIETIES.—It is always advisable to have as few varieties as possible. The cultivator will be able to determine whether early, mid-season, or late fruits are most suitable, and act accordingly. Generally, the White Heart or

Bigarreau cherries are most profitable. Some variety, however, is advisable; each row or set of rows should be of one sort, so arranged in their order of ripening that the picking can begin at one end of the orchard and finish at the other, to save unnecessary removal of tent, ladders, and other accessories. The Flemish, May Duke, and Morello are useful for short rows in corners; also as shelter from the wind in exposed positions, where they can be planted twice as thickly as the larger growing sorts.

EARLY CHERRIES.—Black: *Early Rivers*, *Old Black Heart*, *Knight's Early Black*. White: *Frogmore Bigarreau*, *Ludwig's Bigarreau*, *Elton Heart*. Red: *May Duke*.

MID-SEASON.—White: *Kent Bigarreau*. Black: *Black Eagle*. Red: *Royal Duke*.

LATE.—White: *Napoleon Bigarreau*, *Cleveland Bigarreau*, *Bigarreau de Mezel*, *Emperor Francis*, *Florence*, *Windsor*. Black: *Waterloo*, *Black Tartarian*, *The Noble*, *Turkey Heart*. Red: *Late Duke*, *Flemish*, *Kentish*, *Morello*.

N.B.—“White” is but a general term, as the colour of these cherries varies from pink to a dull crimson. They are, however, known as white cherries in contradistinction to the black and red varieties.

GARDEN CHERRIES

There are two ways in which these can be successfully grown: first, under a permanent protection of wire-netting as bushes or pyramids, to be kept low and pruned, for instance, as dwarf apple trees. They should be planted 12 feet apart. Trees two or three years old are the most suitable, with the branches disposed in a cup-shaped form. When such a plantation is covered with permanent wire-netting, until the space is filled by the cherry trees, bushes of gooseberries, currants, or strawberries may be grown between them for some six or eight years, thus utilising both the land and the structure before the cherries come into full bearing.

It is advisable to prune garden cherries early in the winter, as they are then much less likely to gum. Some training is needful to bring them to the requisite shape. When once this is obtained, a shortening of the side shoots and the terminal leaders is all the pruning necessary. Very fine, well-ripened fruit can thus be grown, fit for the most select dessert, and no trouble need be apprehended from birds if the netting is properly fixed and secured.

In making a selection for this purpose, a Duke variety should be planted between each tree of the stronger or Heart varieties; both the very earliest and latest sorts should be included. As these pruned bushes are liable to gum and die from insect attacks as well as other causes, it is well to have a small stock of young trees, so that a vacancy can be filled at once by a developed tree. Such reserve trees being transplanted every two years will be prepared for permanent planting in the protected area without any risk or loss of crop the first year, but the removal should be made in November.

CHERRIES FOR BUSH TREES, PLACED IN THEIR ORDER OF RIPENING

VERY EARLY.—**Guigne de Louvain*, **Guigne d'Annonay*, **Belle d'Orléans*; *Bigarreau Jaboulay*; **Early Rivers*, **Ludwig's Bigarreau*, *Baumann's May*.

EARLY.—**Knight's Early Black*, *Frogmore Bigarreau*, *Bigarreau de Schreken*, **Governor Wood*, **May Duke (Old)*, **Reine Hortense*, *Werder's Black*, **Belle de Choisy*, *Elton Heart*.

MID-SEASON.—*Waterloo Heart*, **Royal Duke*; **Kentish Bigarreau*; **Black Eagle*, *Flemish and Kentish Red*, **Emperor Francis*, **Archduke*, *Ramon Oliva*.

LATE.—**Cleveland Bigarreau*; **Bigarreau Napoléon*; **Nouvelle Royale*, *Bohemian Black*, **De Mezel*, **The Noble*, *Noir de Schmidt*, **Géant de Hedelfingen*, *Noir de Guben*, **Late Duke Ronalds*.

LATEST.—*Florence*, **Black Tartarian*, *St. Margaret's*, **Windsor*, *Morello*, **Guigne de Winkler*. Those marked with an asterisk are most desirable for pot culture.

CHERRY TREES ON WALLS

BY OWEN THOMAS

There is no doubt that the best cherries, as regards size, appearance, and superior flavour, are obtained from trees grown on a wall with a south, south-west, or west aspect. Provided the trees have had intelligent cultivation, the dessert cherry will succeed on walls with any aspect. At the Royal Gardens,

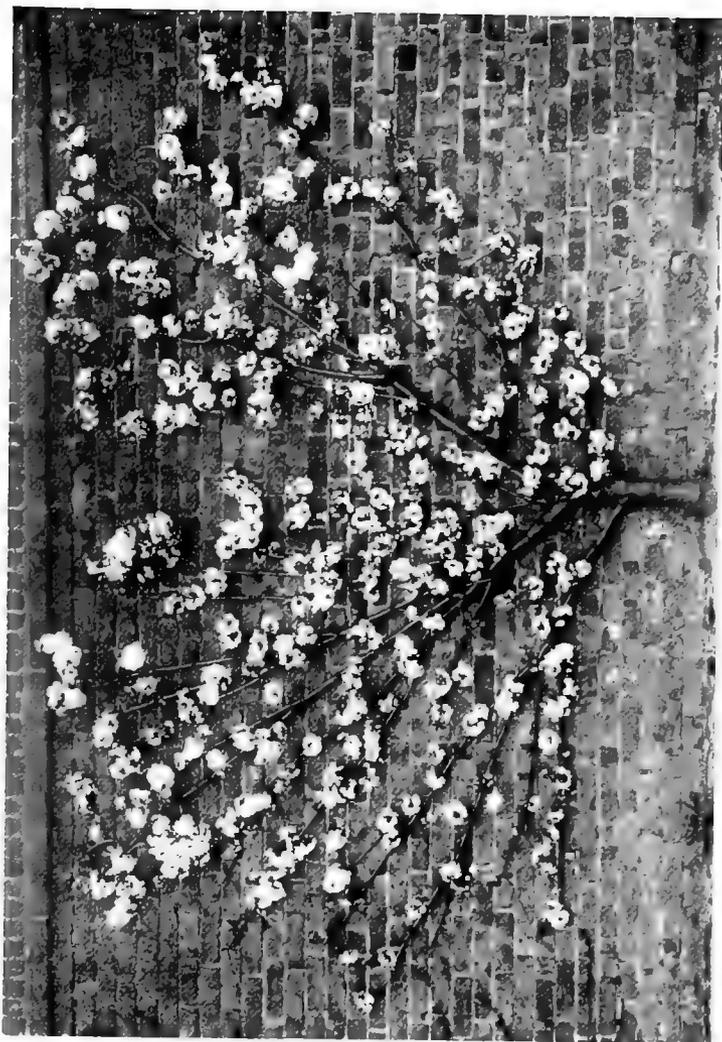


SIDE SHOOT PINCHED

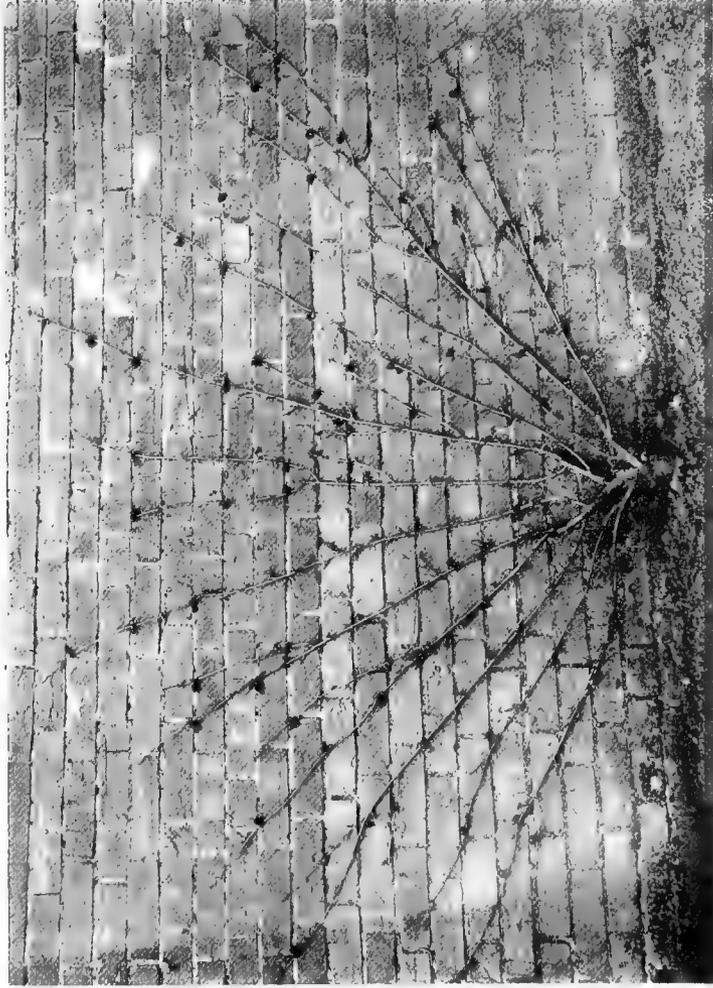
(b) First at fifth leaf; (c) lateral to one leaf;
(d) sub-lateral at first leaf; (e) point of
winter pruning.

Windsor, we had them even on north walls, where they seldom had the advantage of a gleam of sunshine, yet they never failed to produce satisfactory crops, and, what will seem perhaps more surprising, is the fact that the quality of the fruit was excellent. As the cherry will prove a success on walls with such various aspects, where it is desired to prolong the cherry season, plant a number of trees against a north wall, not only late varieties, but the best-flavoured early and mid-season varieties as well.

As regards the preparation of the ground for planting, little need be said here, as the instructions given for preparing the border for the peach or the pear will answer equally well for the cherry. As I have already stated, a somewhat marly soil suits the cherry best. In this soil, with good drainage and proper watering and mulching in hot weather, it will grow to perfection. If the land the cultivator has to deal with is of a very heavy and clayey nature, then the best system to adopt to bring this into proper condition for planting is to burn the clay, afterwards adding to each cartload two barrow-loads of road scrapings, burnt refuse or wood ashes, the same quantity of brick rubble broken small, and old mortar rubble. When the whole is turned over and mixed add a good sprinkling of fresh lime. On the other hand, should the land be light, marl should be applied; as such land is generally poor, a couple of barrow-loads of well-decayed manure may be added with each cartload of soil, as well as a liberal dusting of lime when mixing. I have been careful not to recommend the addition of manure to fertile soil for the cherry, for the greatest trouble one has to guard against in cultivating a young and healthy cherry tree is gross growth; if gross branches are produced, gumming and canker generally follow.



THE DESERT CHERRY AS A WALL TREE.



YOUNG FAN-TRAINED MORELLO CHERRY TREE ON WALL.

FORM OF TREE.—The best form of training for wall cherry trees is the fan shape, and three-year-old trained trees are the best. At this age the framework of the tree will have been properly formed at the nursery, and its symmetry afterwards will be easily maintained by the grower. Some growers prefer and recommend the horizontal form of training for wall cherry trees. No doubt they succeed very well in this way, but in my opinion better results are obtained from fan-trained trees. I have always found it a good plan occasionally to buy a few maiden cherry trees, planting them wherever there is a small space available on the walls, afterwards training them as one may wish.

PLANTING.—Presuming that fan-shaped trees have been obtained, and that planting time (end of October or November) has arrived, the trees should be placed from 12 to 15 feet apart, with a tall standard (fan-trained) planted between. In the following season they will make satisfactory progress, and it must not be forgotten that a mulch of short manure should be applied over the roots and occasional waterings be given in hot, dry weather, and the oftener the syringe or the garden water-engine can be used in washing the trees so much better will their progress be. As a rule, the growth a young cherry tree makes the first year after planting is small, and scarcely any pruning will be necessary the following winter; but should it happen, as occasionally is the case, that a strong shoot is formed, this must be corrected in the same way as directed for the peach, &c., namely, by lifting the tree and cutting back the strong root which will invariably be found to have formed. The second year after planting is an important one in the life of the tree, for during that year it will have made good growth, and this the cultivator must dispose so as to build up a symmetrical tree. When first planted, a three-year-old tree should have from four to six branches. After the second year's growth it should have six more branches. Every year will add its quota until the centre of the tree is complete. Future development will be confined to the extreme ends of the branches, and these, as time goes on, will extend a long way; for the cherry tree lives to be old, and, as a rule, the older it is the more freely it bears. The question of pruning is usually a very simple matter, for the reason that the tree is such a persistent and regular cropper that wood growth is limited. Spur-pruning is the system recommended, and this consists in cutting back the current year's shoots which form on the branches to within a couple of buds of their bases, to shortening the fruit-spurs when they become too large and are too far away from the wall, and also occasionally to thinning out fruit-spurs on the



PRECEDING YEAR'S GROWTH STOPPED AND SHORTENED

(f) Fruit produced from blossom buds formed at side of wood buds in previous year; (g) spurs; (h) shoot pushed from lowest bud of preceding year's wood, stopped at fifth leaf; (i) point of shortening at winter pruning.

branches when they become, as they often do, too numerous and crowded. The same end may be attained in an easier and better way by disbudding or thinning out the shoots in spring, which is not so commonly practised as it ought to be.

PROTECTING THE BLOSSOM.—It is a race between the cherry and strawberry as to which shall gladden the heart of man with the first hardy fruits of the year, and from my long experience and results of observation I scarcely know to which to award the palm. I am led to make these remarks by the fact of the cherry being an early fruiter, and therefore early in bloom, and exposed to the frosty and inclement weather of early spring that is so disastrous to many of our hardy fruits; therefore, the question of protection for the preservation of the blossom becomes an important one. In the case of the cherry it so happens that the tree produces bloom in such abundance, certainly in much greater quantity than any other hardy fruit tree, that its profusion serves in a measure as a protection against frost. As a matter of fact, unless the frost happens to be unusually severe, enough bloom escapes (certainly in four seasons out of five) to provide an ample crop of fruit, so that no provision in the way of canvas blinds or other covering is necessary. I am now speaking of wall trees. In the open the same immunity is not enjoyed, and consequently full crops are not so common. As regards thinning the fruit, I advise this to be carried out sparingly, and only resorted to when the trees are bearing an extraordinary crop, and then only for the sake of the tree rather than from any inability to mature the crop satisfactorily. With generous and intelligent treatment in the way of mulch-

ing, watering, and keeping clean, the cherry is capable of bearing and ripening immense crops every year.

PROTECTION FROM BIRDS.—In the case of the cherry protection from birds is imperative, and when the trees are grown on walls this is easily provided. Herring nets are the best for the purpose, and these are now offered at so cheap a rate, and last so long if carefully stored in a dry state during the winter, that they are even within reach of the cottager. The best way of fixing a net against a wall is to make a skeleton framework of stout poles and laths, the poles to be 6 feet long and driven into the ground deeply enough to be



A SPUR BECOME ELONGATED AND CROWDED BY ANNUAL GROWTH

(j) Point of shortening at winter pruning.

secure, at a distance from the wall of 6 feet, and about 6 feet apart. On the tops of the poles laths must be fixed, and resting on these, at intervals of 6 feet, others must be placed with one end resting on the top of the wall, acting as rafters to carry the net. By this simple means absolute protection is afforded,



STANDARD CHERRY TREE FIVE YEARS OLD (UNPRUNED).



POT CHERRY TREES IN BLOOM UNDER GLASS.

without the labour of removing the net each time the fruit is gathered and the discomfort of stooping; the net may be left over the trees until all the fruit has been gathered.

THE MORELLO CHERRY.—This hardy, prolific, and useful cherry thrives well on a north wall, as a bush in the open, or even planted as a hedge. It is not particular as to climate, as it succeeded well on a north wall at Chatsworth (Derbyshire), where the conditions for the culture of hardy fruit are as unfavourable as any part of England. The Morello cherry is an excellent poor man's fruit; it is a sure and heavy cropper, causing little trouble and comparatively no expense, and will thrive well in any ordinary garden soil. It is a fruit that always finds a ready sale at remunerative prices; it makes the best cherry brandy, and preserved for puddings and confectionery it is invaluable to the cook or housewife during winter. The system of pruning in the case of the Morello is different to that of the ordinary cherry, in that the spur system is discarded for that by which peaches are usually pruned, viz. leave the previous year's shoots their full length, and tie or nail them to the wall 3 inches apart all over the tree. The trees must be trained fan-shaped.

THE CHERRY UNDER GLASS

The general cultural remarks concerning cherry culture against walls out-of-doors apply equally to trees grown in a glass-house; the culture of cherries in pots under glass is explained in a separate chapter. The cherry as a crop under glass is an important and valuable one, as the fruits are ripe when other choice fruits are scarce, namely, late in April, and throughout the month of May. The best results are obtained by training the trees (fan-shaped) to a trellis fixed to the roof of the house and 18 inches away from the glass. Where this is not convenient, they succeed very well planted against the back wall provided the light is not too much obscured by other plants growing in front. The point of greatest importance to observe in forcing cherry trees is not to excite them into growth and flower too quickly. It is not safe to commence before the middle of January, and fire heat must not be applied for three weeks after this, the grower being satisfied with the heat obtained by closing the house early. In forcing the cherry one should bear in mind that the trees must not be made to grow too quickly at any time from the day the house is started until the fruit is formed. Afterwards more heat may be allowed, especially by closing early, that the house may be warmed by the sun; the cherry does not like artificial heat at any time. Still, when the fruits are formed, it is quite safe to make use of it in dull and cold weather to keep up the necessary temperature. It is also necessary to have sufficient heat in the pipes to maintain a dry and buoyant atmosphere while the trees are in bloom; but avoid at that time a high temperature, and be sure you have a good circulation of air, and an absence of dampness round the flowers night and day. If you must err at all, err on the side of a low temperature during the time of flowering rather than a high one, bearing in mind to have the conditions as similar as possible to those prevailing out-of-doors when the trees are in bloom, and we know it is then

bitterly cold sometimes. I only mention this to emphasise the fact that in order to secure a heavy crop of fruit a moderately low temperature, with plenty of air, must be maintained until the fruit is formed. Should the flowers have but little pollen, artificial fertilisation must be resorted to when the air of the house is dry, by drawing a rabbit's tail over the blossoms. While the trees are in bloom the temperature should be kept from 48 to 52 degs. Fahrenheit ; after the fruits are formed it may gradually be raised to 55 degs. until the stoning period is over (*i.e.* when the stones in the fruits have formed), when it may again be raised to 62 or 63 degs. ; at this it must afterwards be kept, allowing it to rise 6 or 7 degs. with sun-heat after closing the house. The cherry requires careful watering, dislikes anything approaching a sodden condition at the roots ; at the same time the soil must never be allowed to approach a dust-dry condition, not even in winter. It is always safe to give a good watering with clear water at a temperature of 60 degs. when the house is first closed, and afterwards just as the trees are coming into bloom, and periodically as often as the grower thinks it necessary, say once a fortnight. Weak manure water from the cowyard or stableyard is the best, with an occasional watering with weak guano water ; when the stoning period is over, a slight application of nitrate of soda is invariably attended with good results.

DISEASES.—The only ailments which seriously affect the cherry tree are gumming and canker. The chief cause of the former, in my opinion, is grossness of growth, especially in the young stages of the tree's life, and more often than not gumming is the precursor of canker, although the latter, no doubt, is occasionally caused by other means, such as bruising, careless knife-cuts, and by very severe frosts. When the trees are affected with one or the other of these ailments there is no *cure* so far as I know. The most effectual proceeding is to cut back the branch to a point near the stem not affected, when a new shoot will usually appear, and so furnish the tree with a substitute in the shape of a healthier and a better branch. The disease of canker is sometimes distributed over a great part of the tree, and the latter may be a large and valuable one, in which case the remedy previously recommended is not applicable. The only thing to do in this case is to cut out the affected parts, and to wash the wounds scrupulously clean, using for this purpose a strong solution of soft soap and soda. With careful and timely attention in this way a tree affected will continue to bear heavy crops of fruit for many years. In the case of a young tree where canker may follow gumming, and where gumming is usually caused by luxuriance of growth, the best preventive is to lift and prune the roots on the first appearance of gross shoots ; in all probability the one root-pruning will prove effectual, as it will not only check the luxuriance of growth, but will make the tree more fertile, which of itself is a safe antidote to coarse growth.

INSECT ENEMIES.—The black fly is the most serious and stubborn enemy we have to contend against in the cultivation of the cherry on walls. Where this has a strong hold on the trees, the first thing to do will be partially to prune the affected shoots by cutting them back 6 or 7 inches ; the insects shelter themselves snugly beneath the leaves at the extremities of the shoots,



CHERRY TREES GROWING IN POTS OF SIX INCHES DIAMETER.



CHERRY GOVERNOR WOOD GROWING IN A POT.

where it is next to impossible to dislodge them. I need scarcely say that the points of the shoots when cut off should be carefully collected and burnt without delay. The trees should then be washed late in the evening by means of a syringe or the garden-engine, using a solution of paraffin, soft soap, and tobacco juice in the proportion of half-a-pint of paraffin to three gallons of water; half-a-pound also of soft soap and half-a-pint of tobacco juice added, the whole to be mixed together as hot as the hand can bear the water. One application of this mixture, if thoroughly applied, will rid the trees of the enemy; the solution should be washed off early next morning. It is far better to prevent the fly securing a hold by watching for its first appearance in spring, and then to nip it in the bud by a timely application of the above remedy.

VARIETIES FOR WALLS AND CULTURE UNDER GLASS

Frogmore Early Bigarreau, Bigarreau Heart or White Heart, Bigarreau Monstrueux de Mezel, Bigarreau Napoléon, Elton Heart, Emperor Francis, Florence, Governor Wood, May Duke, Late Duke, Guigne d'Annonay, Guigne de Louvain, Belle d'Orléans, Archduke, Waterloo Heart, The Noble, St. Margarets, Knight's Early Black, Early Rivers, Black Tartarian, Bigarreau Jaboulay, Bigarreau de Schreken, Géant de Hedelingen, Mammoth, Bigarreau Heart.

Of Morello Cherries. *Flemish Red, Kentish Red.*

THE BEST CHERRIES

By GEORGE BUNYARD

In preparing a list of cherries, it has been thought best to make a selection of the most useful and distinct only, having regard to the duration of the ripening period, their fertility, and to their use as choice dessert garden fruits and profitable cherry orchard fruits.

It was considered desirable also to give descriptions of their foliage, which being taken from young free trees of two and three years old, may differ slightly from the leafage of established trees, whether in gardens, on walls, or in orchards. The fruits have been figured from standard orchard trees, and therefore are not so large as fruits grown in an orchard house or upon walls. The form, however, is the same.?

ARCHDUKE.—*Fruit*, large, shining, deep blood red, rich, juicy, and refreshing; *foliage*, resembles May Duke; *growth*, upright, compact and leafy, fruits borne freely in clusters, good for pot culture; *season*, mid-season. The fruit is similar to Royal Duke. *Fertility* excellent.

BELLE DE CHOISY.—*Fruit*, almost transparent, pinkish red, tender, juicy, and sweet; *stalk*, thin; *foliage*, deep green, flat and shining, very broad, roundish, heavily notched; *growth*, vigorous, drooping leaves far apart. *Fertility* moderate.

BELLE D'ORLÉANS.—*Fruit*, medium size, pink, almost transparent; *flesh*, very tender, sweet, rich, and juicy; *foliage*, pale yellowish green, flimsy, oval shape with lance-like points; *glands*, very large; *stipules*, clasping the growth; *growth*, moderate, leaves drooping, few. A very fine cherry, suitable for walls and pot culture; *season*, very early. *Fertility* good.

BIGARREAU DE MEZEL.—*Fruit*, deep red, marbled blood red with patches of orange, flat on one side; *flesh*, primrose colour, very firm, rich flavour; *stone*, long, flat, and pointed, adhering to flesh; *foliage*, deep green, bluntly notched, oval shape; *glands*, one to three; *stipules*, green, very prominent; *growth*, sturdy and upright; *fertility*, excellent; *season*, late. This is one of the large late sorts that sell at such high prices at the end of the season.

BLACK EAGLE.—*Fruit*, deep shining black, rather flat on one side; *flesh*, pinkish red; *stone*, round and smooth; *flavour*, very rich when fully ripe; *foliage*, deep olive green, very large, broad, and stout at the base of the shoots, but more tapering and pointed in the younger growths, deeply notched; *stalk*, of medium length; *glands*, large, red; *growth*, vigorous and spreading, forming a large orchard tree, a fine variety for walls; *fertility*, first-rate; *season*, rather later than the main crop.

BLACK HEART.—*Fruit*, rather large, bluntly heart-shaped, often irregular, colour deep black-red, mottled, skin shining; *flesh*, rich and firm; *stone*, spoon-shaped; *stalk*, long and thin; *foliage*, dark green, spoon-shaped; *growth*, robust, but rather spreading. A very fine variety. *Season*, late mid-season. *Fertility* first-class.

BLACK TARTARIAN.—*Fruit*, extra large, shining coal-black, very handsome, and hangs late on the tree; *foliage*, deep green, very broad, mid-rib depressed; *stalk*, olive green; *stipules*, green; *wood*, cane-like—this variety has the largest leaves of any cherry; *growth*, very vigorous, stout, rather upright, forms a large, tall orchard tree; *season*, late; *fertility*, good. It is one of the finest for garden culture in all forms.

CLEVELAND BIGARREAU.—*Fruit*, brownish red with flushes of deep crimson, marbled gold and yellow, flat on both sides; *flesh*, dull primrose; *stone*, flattened and pointed, very fine flavour; *foliage*, pale green, deeply notched; *stalk*, long, dark chocolate colour; *glands* red and *stipules* brown, the leaves are wide apart and the shoots prominent; *growth*, moderate, spreading; *fertility*, excellent; *season*, late.

EARLY RIVERS.—*Fruit*, bluntly heart-shaped, deep shining black, flat on one side; *flesh*, mulberry black, very juicy and rich, one of the very best cherries for bearing and quality; *foliage*, pale olive, rather thin, broadly oval and tapering to a sharp point; *glands*, two or three, reddish brown; the leaves have long stalks, and are thinly disposed on the shoots; *growth*, weeping, orchard standard trees require to be severely pruned for five years to keep the lower branches from cattle. It grows very freely and never fails to bear, and from its early season makes very high prices in the market. It is suitable for pot culture, growing on walls or in any other form for gardens; *season*, very early; *fertility*, excellent. In use a long time.

ELTON HEART.—*Fruit*, pale yellow with pale rosy blotches and deep red—sometimes crimson—flushes; *stone*, small, somewhat flat and pointed; *flesh*, firm, flavour very rich, sweet, and juicy, fruit is often very large; *foliage*, pale green, long; *stipules*, greenish white, *wood* and leaf-stalks nut-brown, midrib pink; *growth*, very free, inclined to weep as an orchard tree, valuable for all garden purposes; *season*, early; *fertility*, excellent.

EARLY LYONS OR BIGARREAU JABOULAY.—*Fruit*, medium size, a very early variety, of a purplish red colour when fully ripe; *foliage*, deep olive, very large, spoon-shaped on old trees and pointed on younger; *stalk*, very long, wood brown and shining; *growth*, very sparse, weeping. As the buds do not break freely it is often of awkward growth; best suited for wall culture.

EMPEROR FRANCIS.—*Fruit*, bright red marbled with white often immense; *flesh*, crisp, very juicy and highly flavoured; *stone*, very small, bluntly pointed; *foliage*, deep olive green, flat, very large, deeply notched, leaf-stalk stout, of medium length; *stipules*, fringed, green; *glands*, large, oval; *growth*, robust and upright; not yet proved as an orchard tree, but likely to be useful, invaluable as a garden tree, succeeding in all forms. *Fertility* good. *Season* late.

FLEMISH RED.—*Fruit*, bright shining scarlet, with pale yellow and deep carmine on the sunny side, slightly flattened on one side, produced in bunches; *flesh*, primrose, almost transparent, crisp, very juicy, with rich acid flavour; *stone*, small, often pulling out with stalk, the best cherry for cooking and preserving; *foliage*, small, bright green, dis-



A BRANCH OF WHITE HEART CHERRIES.



CHERRY BLACK TARTARIAN ON A WALL UNDER GLASS.

posed thinly over the shoots; *growth*, slender. This variety forms a close compact tree and bears freely; trees may be planted in orchards 15 feet apart, and are often used for outside rows to shelter the larger fruited sorts; most beautiful objects when the fruit is fully ripe. *Season* late.

FLORENCE HEART.—*Fruit*, bright shining red and pale yellow, slightly flat on one side; *flesh*, primrose colour, crisp and juicy; *stone*, small; *foliage*, bright green, long and lance-shaped, acutely pointed, short jointed and leafy; *stipules*, prominent, greenish brown; *growth*, strong and upright. As an orchard tree it forms long branches, with few side shoots. On account of this variety ripening late it often realises very high prices in the market, but the tree is apt to gum and lose its branches; on a north wall the fruit attains great size and keeps late. *Season* latest. *Fertility* very good.

FROGMORE EARLY BIGARREAU.—*Fruit*, orange colour, with reddish net-markings and a flush of deeper red; *flesh*, firm, primrose colour, sweet and rich; *stone*, spoon-shaped, indented and lined on one side; *foliage*, dark green, leathery, broadly oval; *stipules*, prominent; *glands*, two or three; *growth*, free and branching, one of the finest for orchard and garden culture, bears freely in clusters. *Season* early. *Fertility* remarkable.

GÉANT DE HEDELINGEN.—*Fruit*, crimson black; *flesh*, very firm and crisp, of a blood red colour, very rich flavour; *stone*, large, oval, often adhering to flesh; *foliage*, pale green, oval-shaped, bluntly serrate; *stalk*, very long, wood greenish brown, leaves drooping; *growth*, robust and free; *fertility*, moderate; *season*, rather late. This grand black cherry is one of the largest and best. It is worthy of culture in even a limited collection.

GOVERNOR WOOD.—*Fruit*, pale yellow and soft red, very handsome and large; *flesh*, tender, juicy, sweet, and very pleasant; *foliage*, pale green, deeply notched, wide apart, the terminal leaves are reddish; *stipules*, brown, leaf-stalk short; *growth*, moderate, a good cherry for garden culture in any form, fruits very freely in clusters. Orchard trees in some soils are apt to gum; does well in the Midlands. *Season* early.

GUIGNE D'ANNONAY.—*Fruit*, shining black, round, produced in clusters, medium size; *flesh*, charcoal black, flavour very rich, and altogether first-rate; *foliage*, rather longer and more robust than the white-fleshed Guignes, pale olive green, regularly pointed and bluntly serrate; *growth*, moderate, forms a well-shaped tree, excellent for garden culture in all forms. This variety bears enormously in clusters, and from its precocity is most valuable; it is proving very hardy, and will be a great gain as an early orchard fruit also. *Season* earliest.

KENTISH BIGARREAU.—*Fruit*, dull carmine, shaded and blotched red, orange and primrose, flat on both sides, when fully ripe it is bronzy red; *flesh*, deep primrose, crisp, juicy, and very rich flavour; *stone*, heart-shaped, adhering slightly to flesh; *foliage*, olive green, long, oval, sharply pointed; *glands*, of medium size; *growth*, vigorous, branching, forming a shapely orchard tree. This is one of the best and most profitable cherries grown, and is the glory of the Kent orchards. It succeeds in all forms as a garden tree, and is hardy and not so liable to gum as some. *Season* mid-season. *Fertility* excellent.

KENTISH RED.—*Fruit*, bright reddish crimson, produced in bunches; *flesh*, tender, juicy, and with a distinct flavour, almost transparent; *foliage*, bright green, small, and disposed wide apart on the branches, footstalks are stout and long; *growth*, twiggy and weeping. *Fertility* first-rate. *Season* late. This is the favourite cherry for drying, for tarts and for jam. It has a distinct rich flavour, and is quite a sweetmeat. It makes a good small orchard tree, a pretty pyramid, and a fertile wall tree, fruiting after the style of the Morello. The Flemish is larger and later and as free-bearing as the Morello.

KNIGHT'S EARLY BLACK.—*Fruit*, blood-red to black, round, medium size, very rich flavour, and one of the finest for early gatherings, bears enormously in clusters; *foliage*, medium sized, resembling that of the May Duke; *growth*, moderate, compact but weeping. *Fertility* excellent. *Season* early.

LUDWIG'S BIGARREAU.—*Fruit*, large, bright red all over, slightly mottled; *flesh*, firm, very rich, juicy and sweet; *stone*, bluntly spoon-shaped, lined on one side;

foliage, pale green, large and thin, deeply notched ; *growth*, free and spreading, forming a fine orchard tree. *Fertility* excellent. *Season* earliest. An excellent fruit, bearing enormously, and one of the best early white varieties.

MAY DUKE.—*Fruit*, a rich dark claret-red colour ; *flesh*, tender, acid when not fully ripe, but sweet and juicy when ripe ; *stone*, round and smooth, flattened, parting freely from the flesh ; *foliage*, deep green, bluntly oval, very numerous, closely disposed on stout, woody growths ; *stipules*, green, leaf-stalk short ; *growth*, upright, compact. Succeeds as an orchard standard, and is one of the most reliable cherries for an early crop on walls, while its growth makes it very suitable for pot culture. *Season* early. *Fertility* moderate.

MORELLO.—*Fruit*, large, deep blood-red, almost black when fully ripe ; *flesh*, reddish black, juicy, with a refreshing acidity ; *stalk*, long ; *foliage*, deep green, small, and pointed, rather thinly disposed on the stems ; *growth*, weeping ; *season*, late ; *fertility*, first-class. It is usually grown on north walls, but can also be successfully cultivated on orchard standards and pyramids ; when netted the fruit will hang into October if the autumn is dry.

NAPOLEON BIGARREAU.—*Fruit*, rich carmine red, shining, shaded yellow on flat side ; *flesh*, crisp, firm, juicy, and extremely rich and sweet ; *stone*, oval ; *foliage*, olive green, broadly tapering ; *stipules*, clasping the shoots, wood brownish, speckled, the terminal leaves are tinged with reddish brown ; *glands*, greenish and red ; *growth*, compact when young, but forming a very large spreading tree when developed. One of the finest for orchard or garden culture, being hardy and a free-bearer. The fruit ripens just after the Kent Bigarreau, which it resembles. *Season* late. *Fertility* excellent.

NOUVELLE ROYALE.—*Fruit*, deep red or black red, three to four sided ; *flesh*, orange red, rather acid, but juicy, rich, and pleasant, firm, parting from its stone when fully ripe ; *foliage*, large, like May Duke, deep green and very stout, deeply notched ; *growth*, upright, compact, and leafy. A fine garden variety in any form. *Season* rather late. *Fertility* good.

OLD BLACK HEART.—*Fruit*, bluntly heart-shaped, of irregular shape and coloured reddish black, darker when fully ripe, skin shiny ; *flesh*, rich and refreshing ; *stone*, oval ; *stalk*, short ; *foliage*, pale green, rather thin, leaf-stalk long ; *glands*, two or three, prominent ; *growth*, vigorous, making a large and somewhat spreading tree. Being very hardy it often escapes frosts at blooming time and crops very freely. More suited for the orchard than the garden, but succeeds in any form, and is specially valuable for cultivation. *Season* early. *Fertility* excellent.

RONALD'S LATE DUKE.—*Fruit*, very large, bright red, almost transparent ; *flesh*, pinkish yellow, very tender, juicy, and of rich flavour, a great bearer ; *foliage*, bright olive-green, broadly oval, shining ; *stipules*, fringed, green ; *growth*, compact and twiggy, forms a pretty small tree. The fruit, from its lateness, is very valuable, more suited for garden than orchard culture. *Season* latest. *Fertility* excellent.

ROYAL DUKE.—*Fruit*, bright shining red, almost transparent ; *flesh*, dull red, flavour crisp and rich, with refreshing acidity ; *stone*, smooth, parting from the flesh ; *foliage*, broad deep green, stout, and robust ; *growth*, erect and compact. One of the finest Duke cherries, and, as it ripens rather late, is very useful. *Fertility* abundant.

ST. MARGARET'S.—*Fruit*, very large, of rich flavour, colour coal black, shining, the fruit is flattened on two sides ; *stalk*, very long ; *foliage*, large, dull olive-green, bluntly notched, edges curving upwards, hoary beneath, young shoots red-brown ; *growth*, strong and robust, very useful for late crop on cool walls. *Season* latest. *Fertility* good.

THE NOBLE.—*Fruit*, of very rich sweet flavour, colour deep crimson to black crimson ; *flesh*, firm, red ; *foliage*, large, long, and deeply-notched ; *growth*, robust. This new cherry is remarkable for its size and texture. The fruits can be kept in good condition several days after gathering ; grand for orchard and garden culture. *Fertility* extraordinary. *Season* late.

WATERLOO.—*Fruit*, roundish, colour deep crimson-red, becoming black when fully ripe, with minute golden dots, flattened on one side ; *flesh*, sweet and very rich ; *stone*, roundish, very small and smooth ; *foliage*, rather pale-green, large and drooping ;



A MORELLO CHERRY TREE ON NORTH WALL



BUSH CHERRY TREES IN THE ROYAL GARDENS, WINDSOR.

it is this latter character that makes it so valuable in orchards, in showery weather the fruit does not crack when so protected, and it travels all the better when dry; *growth*, rather upright, forms a noble orchard tree, and, from its superior flavour, is valuable for garden culture. *Season*, mid-season. *Fertility* excellent.

OTHER CHERRIES

The following cherries are also good :—

BLACK HEART RACE.—*Bigarreau de Schrecken*, very large and of fine flavour; *Bigarreau Noir de Guben*, enormous size, but lacking flavour; *Bigarreau Noir de Schmidt*, a firm early sort, of rich flavour; *Bohemian Black Bigarreau*, very large; *Windsor*, a very late American sort of a dull mulberry colour, a great bearer.

Of the soft-fleshed "GUIGNES," *Belle de St. Tronc*, *Duchesse de Palluau*, *Empress Eugénie* are very similar to those described; *Guigne de Winkler* is quite distinct, a small-fruited, long-stalked variety that hangs into September; *Ramon Ôliva* and *Early Purple Guigne* are large fruits, like Morellos in size and colour, but sweet and earlier.

Of the MORELLO CLASS :—*Belle Francoville*, a late cooking, red variety; *Belle de Montreuil* and *Reine Hortense* are intermediate between Dukes and Morellos; *Olivet*, from the Continent, is the earliest cooking cherry; *Coë's Carnation*, a late striped red fruit.

CITRON, THE (see p. 205).

THE CRAB

Besides their use as ornamental flowering trees and shrubs, the crabs have a further value as decorative trees by reason of their brilliantly coloured fruits, and the latter are useful for making jelly, compôtes, &c. The crab will succeed in any ordinary garden soil where the apple thrives. The most useful are the following :—

THE DARTMOUTH.—This American fruit is of large size for a crab. It is most beautiful, being of a rich violet plum colour, shading to orange. The tree is of very free growth.

JOHN DOWNIE.—This crab produces its oval-shaped scarlet and yellow fruits as freely as a gooseberry does. It forms a neat tree. The fruits are about one inch long.

THE ORANGE.—A small round crab of a deep yellow colour, marked with black dots; very distinct.

THE SCARLET SIBERIAN is one of the best. The globular, small fruits are produced on long stalks, and are like a cherry in shape; commonly known as the cherry apple. It forms a thin, sparse-growing tree.

THE YELLOW SIBERIAN is similar to the preceding, except that the fruits are of canary yellow colour.

THE TRANSPARENT bears fruits of large size. They are rich yellow, with a pretty red flush. The stalks are long and wiry, and when ripe the central portion of the fruit is semi-transparent (hence its name). It is a favourite with many for dessert. The tree grows freely, spreading its branches.

The above are the best sorts. Cheal's Scarlet Siberian (small, very bright-coloured fruits), the Fairy Crab, Mammoth, and Transcendent are all good varieties. These crabs form pretty garden trees as pyramids, or bushes on the Paradise stock.

CHAPTER V

RED AND WHITE CURRANTS

By GEORGE BUNYARD

IN order to avoid deep digging about these after they are planted and consequent disturbance of the roots, the ground they are to occupy should be heavily manured before the bushes are planted, and the earlier this is done the better will be the result the first season. They are usually prepared by nurserymen on a short stem, which prevents the fruit being splashed by soil; newly planted bushes should be cut back to four buds at the base of the new wood, the top one always pointing outwards. The new growths which will eventually develop should be selected to form a cup-shaped base, using a stake if necessary to train the shoots in the desired form. Any inner shoots not wanted for forming the basin-shaped foundation can be cut away or shortened to three buds. This will strengthen the remaining ones and produce vigorous shoots, which must be again shortened to 6 inches at the end of the season. During the second year the side shoots should be shortened in July to three buds or "eyes," the centres of the bushes being kept open to admit light and air to ripen the wood. When the required shape and size of bush are obtained, the leading shoots may be annually cut back to 1 inch in length, and any slender twiggy shoots can be removed as soon as the fruit is gathered, although the branches should not be stripped of foliage.

CULTURE.—Currants flourish in all soils when freely fed with manure. This should be lightly turned in about Christmas time, and when frost has made the surface friable the soil may be levelled down with a coarse rake. Currants will succeed well in a light soil, and may be grown as basin-shaped bushes, trained on walls and trellises, or as cordons. In dry seasons copious waterings with liquid manure will favour the production of large berries, and where the soil is very dry a mulching of long strawy litter put on in April will keep it cool and lengthen the season of production. Watering upon this will keep the trees healthy and render them less liable to the attacks of red spider.

PRUNING.—In the case of cordon, fan or fancy-trained currant trees, the pruning is usually done in August; the leading shoot is left entire, and the side or lateral shoots are pinched back to three buds. In this way the branches become masses of fruiting spurs, and will require much thinning as the berries develop. Standard trees are best grafted on stocks of *Ribes aureum*. The branches will require some support as they gain size and are heavily fruited,

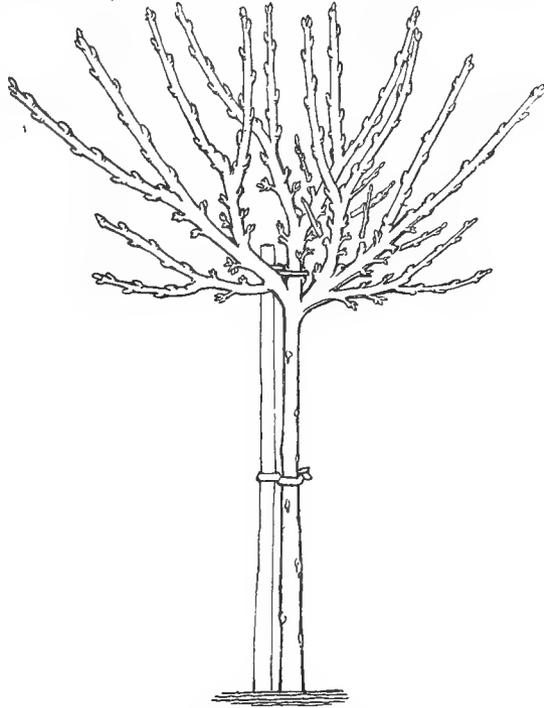
or they may break off. A stout stake 2 feet taller than the tree will enable the side branches to be looped up.

Red currants required for very early picking can be planted on a wall with a warm aspect, but they will need some assistance by surface mulching and syringing, as such hot situations may cause red spider. For very late picking, trained trees should be planted against north walls, and the spur system of pruning followed, otherwise the mass of foliage in such a shaded position may prevent proper ripening of the wood.

White currants are much appreciated for dessert late in the season. Where fruit is required for exhibition the longest bunches should be selected, and the clusters be thinned to develop fine berries. Red currant bushes in market gardens are pruned hard, and are also freely manured. Fruit pays best when sold early, even before the whole bunch is coloured.

PROTECTING BUSH FRUITS

The question of protecting bush fruit trees from the ravages of birds and the effects of frost is an important one to the gardener, and very often the quantities of fruit gathered depend largely upon whether efficient protection has been afforded or not. The old-fashioned method of throwing fish nets over currants, gooseberries, and straw-



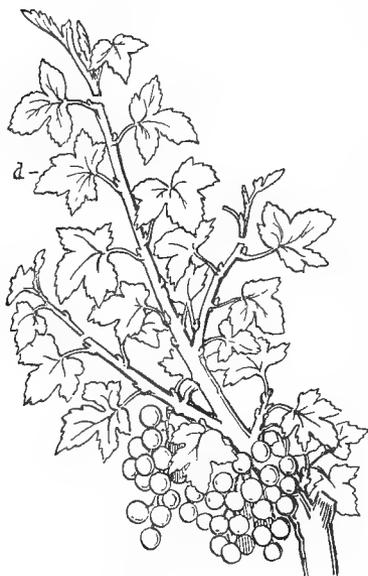
STANDARD RED CURRANT BUSH

Formed by taking a cutting 12 to 18 inches in length, removing all the buds from the lower 6 inches, inserting this part in the soil. Secure the leading growth to a stake, pinch the side shoots to two leaves, the resulting shoots to one leaf, and continue the practice year by year until the leader has attained a height of 4 feet; then cut off a few inches in autumn. In the following spring three of the most promising shoots are selected to form the head. These are shortened in autumn to 4 or 6 inches from their bases, two resulting shoots from each branch are cut back to 6 inches, forming, in the following year, the tree shown. The pruning consists of cutting back in autumn all side shoots to within $\frac{1}{2}$ an inch of their bases, or to two buds. The branches on the left hand are shown pruned, and those on the right hand detached; the leading shoots are shortened to 6 inches, if weakly, or to 8 or 9 inches when strong; more cutting than this is apt to cause the branches to be too sparsely furnished with spurs for bearing, and too weak to support the weight of fruit. The pinched back growths on the main stem may remain until the third year, then reduce them gradually.

berries is to some extent protective, but it leaves much to be desired. Birds can easily reach the fruit through the meshes of the net, and the work of gathering the fruit is made very troublesome. The nets have to be removed and replaced

each time fruit is required, which means a considerable loss of time, to say nothing of the damage done to the nets by tearing.

A system of protecting bush fruits immeasurably superior to the one just mentioned consists of a permanent wooden framework, completely encircling the plantation to be protected, and a covering of close-meshed wire-netting is then fastened to the wooden stakes. It is, of course, quite simple to arrange an opening at each of the corners of the enclosure to allow of the admittance of workers. Ordinary fish netting may be made use of instead of wire-netting, if the latter is found to be too expensive. Such a covering as is illustrated protects the plants from frost in the spring when they are in bloom, and in the summer from birds when the fruits are ripe. A man can conveniently make his way about beneath the net, and fruit-picking can be accomplished with ease and despatch. In the case of currants and gooseberries the erection might remain for many years—as long as the fruit trees themselves, in fact—but with the strawberry this, of course, would not be practicable. Strawberry plants are not retained after they are three years old, and when the plantation was destroyed the framework and covering would have to be transferred



SIDE BRANCH

At base (right hand) spurs, or short stubby growths, not to be pinched; above are side shoots pinched; (*d*) leading growth stopped when the bush is being formed at 9 or 12 inches; if the bush is full grown leading shoots are pinched like side shoots to about five joints.

elsewhere. Supposing fish netting to have been used, this would not be a serious undertaking. In view of the fact that the strawberry plantation is not in one place for more than three years, it would be well always to make use of fish netting, leaving the wire-netting to cover the currants, gooseberries, &c.

THE BLACK CURRANT

This is best planted in a rather damp or shaded portion of the garden; the plants suffer in a dry, hot soil. In order to secure fine, large, juicy berries, the bushes should always be pruned so as to contain no shoot more than two years old. Therefore it is better to purchase them with the branches starting from the base of the plant than on a stem, as with the gooseberry and red and white currants. Strong, vigorous shoots will then be thrown up from near the soil, so that the necessary new shoots can be selected and the branches that have fruited

be cut out. Black currants pay for severe pruning : a greater weight of fine fruit will be produced than when they are left unpruned ; then they bear a mass of small berries. The culture is most simple. Feed them each year with the richest pig or cow manure available (in Kent sprats and fish-heads are often



SIDE BRANCH (RED CURRANT) SUMMER PRUNED

(i) Summer growth pinched ; (j) point of winter pruning ; (k) spur.



SIDE BRANCH (RED CURRANT) WINTER PRUNED

(e) Leading growth shortened to below lateral growth that pushed from upper buds after pinching ; (f) side shoots shortened to two buds ; (g) short side shoot that may be left entire, or shortened to two buds, as indicated by cross line.

used). Dig this manure in about Christmas, and level the soil in March with a rough rake ; keep down weeds. Do not plant less than 8 feet apart if in the open. Late fruits can be grown on north walls, but the black currant does not lend itself to cordon-training, the old wood then cannot be removed annually.

THE BEST BLACK CURRANTS

BALDWIN'S (Carter's Champion).—A variety which originated in East Kent, and is the best for general use. The berries are large and sweet. Carter's Champion is considered to be the same.

BOSKOOP GIANT OR MAMMOTH.—This Dutch variety is a stronger grower than the others, has large foliage, larger berries and longer bunches, and its vigorous stems seem to resist the black currant mite better than other sorts. F.C.C. 1902.

BLACK NAPLES OR WHITE BUD (Maple, Green Bud).—A dwarf-growing variety of great excellence. Other sorts are Lee's Prolific and Victoria, but they do not differ materially from the three named.

THE BEST RED CURRANTS

THE SCOTCH RED [OF KENT] (Moore's Seedling, Champagne Red).—This is probably Knight's Early ; has an upright growth. The short bunches are composed of very large berries, of bright colour, which ripen before any other.

NEW DUTCH RED (Chiswick Red, Defiance).—A very prolific variety, of spreading habit. The bunches are long, and the fruits of a rich, deep colour.

RABY CASTLE (Late Dutch, Houghton Castle, May's Victoria, Cherry).—A free spreading grower, bearing very freely long bunches of small deep crimson berries.

LA VERSAILLAISE (Fay's Prolific, La Fertile, Comet).—This variety has many names. It is a strong grower, but the shoots are apt to break off at the base. The berries are extra large and fleshy and very sweet, of a deep red colour. Most valuable when trained and supported.

PRINCE ALBERT.—This is a sturdy grower. The berries are orange coloured, and freely produced late in the season. The stems are reddish and the foliage is deeply cut.

THE BEST WHITE CURRANTS

WHITE DUTCH (Grosse Blanche).—Berries medium sized, transparent, of a creamy-brown colour, with white veins. A good sort, which under liberal culture gives large crops of well-flavoured fruits. The bunches contain seven to nine berries.

WHITE TRANSPARENT (VERSAILLES).—Berries paler than the above variety. Bunches contain eight to nine berries; the largest and best in this section. It is a free bearer, and a very handsome variety.

SHILLING'S CUT-LEAVED WHITE.—This is a sparse grower but a great cropper, and the berries are very sweet. Bunches of fruit consist of from four to six berries; very handsome. There are several other varieties, but those described are the best.

DAMSON, THE (see p. 160).

EUGENIA, THE (see p. 215).



THE BEST WAY OF PROTECTING BUSH FRUITS.



FIG BROWN TURKEY. (Two-thirds natural size.)

CHAPTER VI

THE FIG

By OWEN THOMAS

THE industry of fig culture in Britain may be said to be centred in Worthing. There are other localities upon the south coast that one would imagine to be equally well suited for fig culture, but yet the fact remains that the majority of home-grown green figs sent to Covent Garden Market come from Worthing, and these are all grown in the open. Those who have never visited the Worthing fig orchards are astonished to learn of the size, age, and vigour this tree attains there. Even in cottage gardens in the immediate neighbourhood the fig tree thrives remarkably well. It is in and around the small village of Sompting that the chief market supply of figs is obtained. The trees are here planted in groves, irregular now because some have died and been replaced by younger trees, and many of them are 20 feet high and as much through. They are not allowed to grow higher than this, otherwise the labour of gathering the fruit would be increased. On an average the trees are about eighty years old; some there are considerably over a hundred years of age, while others are appreciably less. It is surprising to learn how little attention these fig trees receive beyond the removal of branches when they are quite close to the ground, and therefore almost useless and very inconvenient by reason of their preventing access to the centre of the tree, so essential at the gathering season; dead or unfruitful wood also has, of course, to be cut away. They receive practically no manure, yet it is rarely that a satisfactory crop of fruit is not produced by these remarkable and aged trees; some seasons, of course, are more conducive to a full crop than others. Late spring frosts do considerable damage sometimes when the fruits are quite small. Only one crop of fruit is obtained each year, and gathering commences about the second week in August as a rule, and is not really over until the middle of October, although the fruits gathered then are not so fine as those picked earlier in the season. The fig gardens at Tarring, near Worthing, half an acre or so in extent, are extremely quaint and interesting. The central pathway is bordered on either side with picturesque old trees that have a delightful and unique effect. The branches extend over the path to such an extent that in some places they almost meet. In the large irregular square beds formed by the surrounding walks are also fig trees, and many of the specimens are of great age and vigour. These gardens have a peculiarly interesting history, as the following extract from an old local book, "Sussex Industries," will show:—"The Tarring Fig Gardens, as a garden, date back to the year 1745. It is on record that the sainted Bishop of Chichester, Richard de la Wych,

grafted fruit trees at Tarring with his own hand, and it is presumed these were fig trees. The Tarring Fig Gardens can show a plantation of 100 to 200 trees, and 2000 dozen excellent fruits or so are produced annually, besides a mass of small ones. In summer the garden looks thoroughly un-English. Dense foliage produces deep shade, which adds to the picturesque effect, giving fictitious length to the walks and making the half-acre assume the proportions



PORTION OF A BRANCH SHOWING CHARACTERISTIC GROWTHS AND MODE OF BEARING

(*r*) Three-year-old wood; (*s*) pinched side shoots of previous summer (each shoot was then stopped at the fifth leaf), on these the first crop (and only one outdoors) of figs is produced, ripening outdoors in August or September; (*t*) current year's shoots, which may be pinched and retained for another year (if under glass, and forced from February or earlier, will produce a second crop); (*u*) previous summer's (two-year-old) continuation of branch bearing first crop of figs; (*v*) side shoots which may either be pinched to form spurs, or allowed to extend where space admits for furnishing the tree with bearing wood, and on which the first and only crop of figs outdoors is produced the following season; (*w*) extension of branch growth, which may be trained in full length, if space admits, or be pinched where space is limited, or when desirable, as commonly is the case, to ensure a fruitful habit and assure the swelling of the first crop.

of a forest. The trees are not allowed to grow high, nor are the branches thinned, the object is to produce a mass of overshadowing foliage. They like heat but not exposure to the sun. The manure is put on sparingly in spring and in a fluid state. Of several varieties grown, White Marseilles is the most valued and luscious. The variety Ischia is said in hot summers to ripen to a brick-red colour, and is supposed to be identical with the historic red fig which King James tasted with pleasure in the Dean's garden at Winchester. Brown Turkey is also grown. The harvesting or picking of the figs begins early in



A GROVE OF FIG TREES AT T-IRRING, NEAR WORTHING.



AN AVENUE OF FIG TREES IN A WORTHING GARDEN.

August and continues to the end of October. During that time from 30 to 100 dozen are gathered daily and disposed of in Worthing, Brighton, or London."

Far better prices are now obtained for figs than was the case some years ago. Whereas then 3d. or 4d. per lb. would have been considered a fair price, the growers of to-day are content with nothing less than 8d., and more is often realised. This is a curious and so far as I know an unique circumstance. With every other market fruit it will be found that an increased demand has been met with such a largely increased supply that prices have gone down as a result. With the fig, however, the fact apparently is that the demand has of late years considerably increased, but the supply has not done so proportionately, and prices therefore, instead of falling, have gone up.

CULTURAL NOTES.—As an outdoor crop the fig can be successfully grown in many parts of these islands, but its cultivation out-of-doors has not extended for certainly the past half century. Failures in its cultivation, I believe, are due to a want of knowledge as to the locality and position in which it will succeed. That it will succeed admirably even as a standard or an espalier on the coast of our southern counties is beyond a doubt. The fig is pre-eminently a fruit of the coast-line, and it is useless to try and grow it outside at any great distance inland in consequence of the greater severity of the weather. That there are such positions in many parts of Great Britain besides Sussex goes without saying. I may instance the coast of North Wales, say from Flint to Bangor. I remember also how well the fig was fruited on outside walls at Bodorgan, Anglesea; the position of the garden was less than a quarter of a mile from the seashore.

Where grown against a wall a position facing south or south-west should be given. Ample drainage must be provided for the border, which should not be more than $2\frac{1}{2}$ feet deep, and which at first when the tree is planted should be of limited extent. The soil in which it is planted should not be very rich. It is a wise precaution to build a temporary wall (say 4 feet from the wall against which the tree is planted) as high as the border so as to confine the roots of the tree into this limited space for a few years in order to check luxuriance of

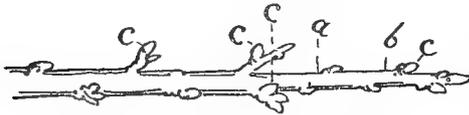


AN EXTENSION GROWTH (STOPPED), WHETHER THE CONTINUATION OF A MAIN OR SUCCESSIONAL BRANCH

(*x*) point of stopping at the fifth or sixth joint ;
 (*y*) new shoot, which must be left intact and trained to continue branch ; (*z*) short stubby side shoot or lateral, which need not be pinched unless making more than two or three leaves ; if there is not room for them, pinch them off altogether while quite small.

growth and to promote early fruitfulness. At the time of planting the border should be made firm, and in the course of four or five years' time this temporary wall may be removed, and the roots given greater space. If the ordinary soil of the garden is good all the work necessary for extending the border will be to trench the new part, adding at the same time a liberal sprinkling of quarter-inch bones and of the other ingredients recommended above. The object of the cultivator should be to secure short-jointed, well-ripened growth during the summer, as on the success or failure in accomplishing this depends success or failure as regards securing a good crop the ensuing season. It is these shoots which produce the fruit. The current year's growth will also produce fruit, but too late to ripen out-of-doors in our climate. Although rich soil is not recommended for the growth of the fig, when a good crop is secured a mulching of rich short manure should be placed over the roots, and in hot weather, while the fruit is swelling, liberal waterings of diluted manure water from the farm-yard should be given every ten days or a fortnight until the fruit approaches maturity.

PRUNING.—After the fruit is gathered what pruning is necessary should be carried out. It will consist in cutting out branches where they are



EXTENSION GROWTH (PINCHED), LEAFLESS

(a) Point of stopping; (b) extension of shoot after pinching; (c) embryonic figs.

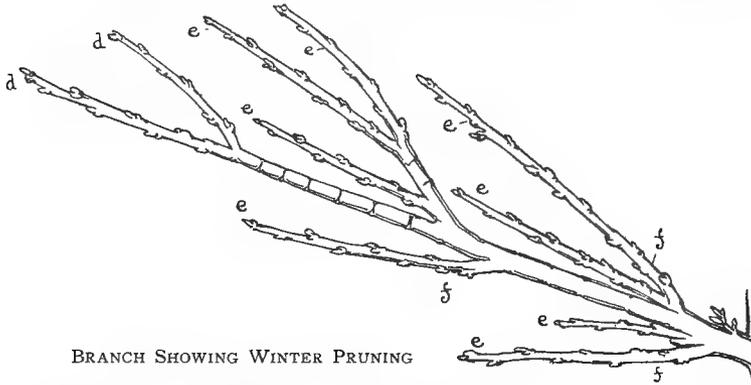
too thick, leaving only enough to furnish the tree with bearing wood for the next year's crop. When the leaves fall in the autumn many half-formed fruits will be found on the current season's growth; these will come to nothing, and should be taken off. If pruning has been

carried out as recommended above there will be little or no winter pruning to do. Still, the trees must be looked over and the growths properly regulated and superfluous shoots cut away. This should be deferred until the end of March, as the tree being tender cut shoots are more liable to damage by frost. The fan form of training is the best.

PROTECTION.—Success or failure depends perhaps more upon the way in which this work is carried out than any other detail of culture. There are many different ways in which this can be done; some untie the branches and bind them round with ropes of hay or straw. The best way, in my opinion, is to cover the border with a layer of bracken fern or dry leaves one foot deep, and quite close to the stem, and then to have hurdles of straw or fern long enough to reach from the border to the ridge of the wall, and say four feet wide. These can be made to fit tightly together and be an effective protection against the most severe frost. They can easily be removed in warm and bright weather to the great advantage of the trees, and as easily returned on frosty nights.

CULTURE UNDER GLASS.—There are two well-known methods of growing this fruit under glass, one by planting the trees out in prepared borders, allowing the branches to extend to almost any limit which the grower may be able to

command, and the other is by growing them in pots or in tubs. The latter system is described on page 66. The fig tree is a strong grower, and will succeed in any form of house as long as there is room for expansion, but a lean-to structure with a long and high pitched roof, or a span-roofed house, suits it best. I would limit the width of the border for the first year to 2 feet. As is well known, it is almost impossible to ripen properly very strong growth, therefore the grower should guard against conditions that in any way favour this. If the house is a good-sized lean-to, I would suggest that it be planted with three trees—one in the middle and one at each end. One tree will soon fill the house, but if two varieties are wanted I would plant Brown Turkey and White Marseilles at either end, and another Brown Turkey in the middle, this to be taken out as soon as the end trees reach the middle. The border must be



BRANCH SHOWING WINTER PRUNING

- (*d*) Extremity shoots having borne fruit are cut away; (*e*) successional shoots for future bearing; (*f*) points where useless wood has been cut out in favour of promising shoots, the object being to keep the tree well furnished, but not crowded with bearing wood, only attainable by securing successional growths.

added to little by little every year, but the fact must always be borne in mind that rather a restricted root area is best for the fig. I do not know any fruit tree which forms surface roots in greater abundance in so short a time than the fig, so after the fruit is gathered top-dress with deer manure and loam in equal proportions. In selecting the trees for planting care must be taken to choose those only which have a clear stem of at least 2 feet from the ground. This is in order not to be troubled with suckers from the base, to which the fig is very subject. When these appear they should be rigorously cut away close to the roots.

TRAINING.—There are two ways of training the fig when planted out. One is to allow it to cover the whole trellis (which should be 2 feet from the glass), and the other is by confining the growths to single cordons under the rafters, with side shoots, in the same manner as vines are grown, only that the shoots are tied rather more closely to the rafters. This system of training answers well, admitting as it does a certain amount of light and sun heat among the

fruit and branches, at the same time securing the perfect ripening of the wood for future crops. Covering the roof with bearing wood also answers excellently, but I do not think the quality of the fruit is so good as when rafter training is adopted. The fig bears more than one crop in the course of the year, sometimes even three. The first crop is produced on the shoots of the past year's growth, and it is the crop which requires by far the most skill to produce. Its success or failure depends almost entirely upon the condition of the preceding year's growth. Should this be soft, green, and immature, the prospect of a first crop worth having is *nil*. The second crop, which is produced on the shoots



BRANCH OF FIG TREE

(*g*) Last year's wood; (*h*) first crop of figs ripe (August to September outdoors); (*j*) second crop of figs, generally worthless outdoors, and should be removed, but ripening in a forcing house; (*k*) embryonic figs, first and only crop generally outdoors the following year.

reason for this is overcropping. The fig stands forcing as well or better than any of our fruit trees. It can be exposed to greater heat, both artificial and natural, than any other hard-wooded fruit, excepting perhaps the vine, and there is no crop which can be produced and matured in the winter months in so little time, for by starting a house towards the end of November ripe figs can be had at the end of March or the first week in April.

VENTILATION, especially in early spring, must have the cultivator's thoughtful care. In the case of the first crop—expected to be ripe at the end of March—no front air should be given, except the weather should be exceptionally hot towards the end of the month, as it sometimes is, when a little may be admitted in the middle of the day for a short time. The temperature of the house at this time of the year can easily be regulated by the top ventilators

of the current year's growth is, generally speaking, a full crop, and easily produced. The third crop is produced on the lateral growths of the shoots which produced the second crop, and should never be taken unless under very exceptional circumstances, as the fruit is small and seldom appreciated. Therefore I would advise that this crop be sacrificed by plucking the fruit as soon as it is perceived, thereby husbanding the strength of the tree for next year. There are two ways of managing the summer growth of the fig, one is by stopping the shoots at the sixth or seventh leaf, and the other by allowing the shoot to grow to its full length. I have practised them both for many years, and one system answers as well as the other.

THINNING THE FRUIT.—The fig sets its fruit, as a rule, most freely. I can safely say that to find a really grand dish of figs at an exhibition is the exception, and I believe that the chief

alone. More air should be admitted as the fruit shows signs of ripening, but the fruit is larger and of better quality in rather a close and moist atmosphere than in a dry one.

FERTILISATION.—It is not easy to say the actual time that fertilisation takes place, but, generally speaking, after the young fruit makes its appearance it swells freely and without interruption until it attains about the size of a walnut. It then appears to remain at a standstill for a fortnight to three weeks; during this time the temperature of the house should be regular and not high, and the atmosphere should also be drier. A sure indication that fertility has taken place is the continued growth of the fruit, and another, also always apparent more or less at this time, is given by the tree casting off most of the barren fruit. The figs will afterwards swell rapidly, and generous treatment should be given in the way of warmth, syringing, and watering.

THE SECOND CROP.—When the first crop has been gathered all weak shoots that can be spared must be cut out, leaving only sufficient of the best shoots of the current year's growth to produce the next crop. These branches should be regulated and tied down, and the border manured. Afterwards give plenty of water at the root, as well as copious syringings morning and afternoon, closing with a good heat; the temperature with sun-heat may rise to 80 or 85 degs. After the second crop is gathered the same routine must be observed in thinning out weak growths as recommended after the first crop. These two prunings are all that are needed, excepting that in winter, when tying the branches to the trellis, it may be found necessary to cut a few more out.

THE BEST VARIETIES

By GEORGE BUNYARD

There are many varieties of figs; but it will be best to restrict our list to those which bear good crops and require no special treatment. The foliage varies so much that only the most distinct is noted:—

BLACK ISCHIA.—*Fruit*, very large, purplish black. Good for outside culture.

BRUNSWICK.—A very free grower, old trees bear abundantly, useless for culture under glass. The fruits are immense, and of a dull chocolate colour, overlaid with green veins, and dotted with golden specks. *Foliage* very much divided. *Flavour* good.

BOURJASOTTE GRISE.—*Growth*, robust, a regular and constant bearer. The fruit is chocolate colour, and of the finest flavour, perhaps the richest of all, suitable only for culture under glass, either planted out or in pots.

BROWN TURKEY.—*Growth*, moderate, a very hardy and free bearer which succeeds in all forms, and is the most reliable fig grown. The fruit is blackish when ripe, with green veins, and of rich flavour.

MALTA.—In all respects like Brown Turkey, except in the shape of the fruits, which are shorter and of peg-top shape; *flavour* good.

MONACO BIANCA.—A very good early variety for pot culture, flesh deep red, of luscious flavour, and very juicy.

NEGRO LARGO.—A very fine large fruit. The first crop of fruits is apt to drop, but the second is very abundant. *Colour*, shining deep chocolate black ; *flavour*, very rich ; not suitable for outside culture ; *foliage*, very large.

OSBORN'S PROLIFIC.—This may be described as a short jointed, free-bearing variety of the Brown Turkey, valuable for pot culture, and hardy outside, fruit of very good flavour, leaves deeply lobed.

RECLER, VIOLETTE DE BORDEAUX, AND NAGRONNE.—Neat growing sorts that bear very freely ; they appear to be alike. *Fruit*, small, deep violet black, often with a white bloom like a plum ; *flavour*, sweet and pleasant ; *foliage*, small, five-lobed.

ST. JOHN'S OR PINGO DE MEL.—*Growth*, very robust ; *foliage*, large and stout. These appear identical, are remarkable for their free-cropping qualities, and force well. The fruit is of a pale olive green colour, the skin thin, and the flesh nearly white, melting, very sweet, tender and juicy ; the second crop is freely produced. Very suitable for culture under glass.

VIOLETTE SEPOR.—*Growth*, moderate ; *fruit*, reddish brown, flesh dull salmon red, and of delicate flavour. A valuable free-bearing sort, suitable for pot culture and forcing.

WHITE ISCHIA OR SINGLETON.—Neat twiggy grower, *foliage* much divided ; *fruits* very small, greenish white, with orange tinge when fully ripe ; then they are delicious. A very free bearer which under glass produces three crops a year ; not hardy.

WHITE MARSEILLES.—*Growth*, strong and vigorous ; *foliage*, three-lobed and large ; a free-bearing, very early sort, useful for early forcing ; *fruit*, pale green, the flesh white and translucent, very juicy, melting, and deliciously sweet. Valuable for outside and inside culture.

Other good varieties are : *D'Agen*, a large green late fig ; *Gourand Rouge*, reddish brown fruits ; *Madeline* or *Angelique*, resembling White Marseilles ; *Nebian*, very large late green. All these are suitable only for culture under glass, except *Madeline*, which does well outside also.

CHAPTER VII

FRUIT TREES IN POTS

By JAMES HUDSON

IN advocating the culture of fruit trees in pots, it must not be supposed that this mode of treatment is intended to supersede planted out trees, whether under glass or in the open air. It is rather an addition to the older and more general system, and by its means very early crops of fruit can be more easily secured—such, for instance, as figs, nectarines, peaches, cherries, and plums; the same structure will permit of two and even three crops being produced within it in twelve months. Again, under pot culture the finest dessert plums are much more satisfactory. The latest peaches and nectarines, if not under the most favourable conditions in the open air, are of much better flavour when grown in pots and ripened under glass. To the *connoisseur* of dessert fruits, Cox's Orange Pippin, or Ribston Pippin apples, for instance, from pot trees, are of superior finish and the finest flavour. In some districts the culture of the best dessert cherries on walls or as bushes is practically a failure. If grown in pots in an absolutely cold house it is astonishing what crops may be secured. It is often said, and with much truth, that it takes years to convert a Britisher to anything really novel and distinct, and the culture of fruit trees in pots is a case in point. If any one requires an object lesson in this direction, a visit should be paid to nurseries where this mode of fruit culture is practised. It is for the private garden, either large or small, rather than for the large fruit-growing establishments which supply our markets, that pot culture is most to be commended. Quality in the former case should predominate rather than quantity, but it does not so often do so in the latter instance. Again, those who prefer to grow their own fruits, rather than purchase them, can by pot culture of the trees make the most of a small space. Beyond doubt, the pot culture of fruit trees in private gardens has not been demonstrated in the most successful manner in many instances. And why not? To some extent it is easy to explain this. One cannot hope to have pot fruit trees grown in the best possible manner if shaded by other trees, such, for instance, as fruit trees trained on the roof. It is not reasonable to suppose that success can be achieved in this way. Light is absolutely an essential factor in successful fruit culture, therefore none the less so for pot-grown trees. For instance, if the roof of any house is covered with trained trees, or with vines, it is useless to think of growing pot trees in that house. On the other hand, if the back wall only of any lean-to or three-quarter-span house is covered with trained trees, then the front may

be filled with one or more rows of trees in pots, according to the space available, but they must not be so tall as to shade the trained trees behind. Span-roofed houses are, however, the best for pot-grown trees. To grow pot trees upon stages is not commendable; it can be done, and successfully, but much trouble is occasioned both as regards watering, and in the pruning, &c., of the trees. To mix pot fruit trees, when in flower, with other flowering or foliage plants is one way of courting failure. I do not mean by this that no other plants than the fruit trees should be grown in the same house, but in any case let the fruit trees first be considered, and everything else be secondary to them, *e.g.* temperatures and ventilation. There is one very distinct, and in many ways novel, use to which pot fruit trees may be put. It is as decorative plants with the ripe fruits upon them. This form of decoration affords a welcome change from the constant use of flowers and foliage plants.

THE BEST HOUSES.—The most convenient houses, and also the best for the trees, are span-roofed ones; these afford a maximum of light and the best ventilation. A useful size is that of about 18 feet wide, with a central walk (strawberries in pots can be grown on shelves above the walk). This house may be 5 feet high at the sides, and 10 feet high at the apex of the roof. For some purposes, and for larger trees, it is better in many respects to arrange for houses of greater width and two walks—say, 24 feet wide, 6 feet high at the sides, and 12 feet to the roof centre. The length can be regulated as may be necessary, a very convenient length being 30 feet for one division. A large house without a division is not advisable in private gardens, as a different temperature in each is often desirable. In the smaller house the pipes can be arranged at the sides, whereas in the larger it is better to provide for at least two pipes around the central bed. No staging is necessary; if some trees need raising it can be done with inverted flower-pots. All the rain water possible should be conserved in tanks, the best position for which is under the beds upon which the trees stand. One standard size of roof glass should always be used—say, 15 inches by 20 inches—and for the sides above the ventilators only 21-inch squares, and of good quality. The top ventilation should be by means of rising lights, the side and end ventilation by means of wooden shutters. These side ventilators should always be hung at the bottom rather than at the top. This is the method adopted in nurseries and in the Gunnersbury Gardens, and is found to answer well; it prevents cold currents of air from rushing in during rough weather in the spring. These houses need not be of elaborate construction, nor are they costly. A great saving is effected in brickwork, but little being required in their construction. For retarding fruit so as to extend the season, a small north house will be found very useful. Under the pot system of culture it is always possible to keep the trees close together until after flowering, but as soon as growth commences they are best placed wider apart. Thus trees sufficient for two houses may be kept in one division until the embryo fruits are formed, thereby effecting an economy in both space and fuel.

SUCCESSIONAL CROPS.—These can be obtained in various ways when all the trees are in pots. For instance, if early forcing is essential, early fruits of nectarines, peaches, and plums may be gathered, and the trees be well hardened



PLUM AND APPLE TREES IN POTS.



SPECIMEN PEACH TREE IN POT.

to withstand exposure outside by the end of June. These trees, by a judicious choice of varieties, would have yielded fruits from early in May to the third week in June, and then a week or so is left for the free use of the syringe and full ventilation. Melons, if sown a month previously and potted in 6-inch pots, would by then be ready to form a successional crop. They should be planted out the first week in July upon hot beds made upon the floor of the house. By the end of September all the melons will be cut, and then the house is free once more, say for chrysanthemums or other autumn flowers, up to the last week in November. Cleansing operations must then commence preparatory to starting the pot trees on, say, December 1, or between that date and the middle of the month. If autumn fruits are in great request late fig trees in pots can follow the melons by thinning them out from other houses. Or late pot trees of plums, pears, and apples might succeed the melons: tomatoes, if preferred, could easily be planted instead of melons. One division of the house should, if possible, be at liberty by the end of October as a storehouse for all trees that are to be forced. The other division that has been used for ripening the latest peaches and nectarines would answer for this purpose. Where the earliest fruit crop is provided by cherries in pots, then an excellent succession is found in late plums in pots (dessert varieties only); these will have flowered, and their fruits have set under an improvised shelter or another house. In order to make the best use of orchard houses devoted to the culture of trees in pots, a selection of various fruits is most desirable, so as to cover as long a season as possible.

CULTIVATION—CHOICE OF TREES.—The best time to commence the culture of fruit trees in pots is in the autumn; then the wood is well ripened and all active growth has ceased. Trees two or three years old, established in pots, are the best. These should be bristling with spurry shoots and fruit-buds. To grow fruit trees in the open ground and sell them after one year's pot culture is not, in the case of nectarines or of peaches, a safe plan to adopt. It may answer for plums or cherries, pears or apples, but even then the trees are not so satisfactory as those which have been in pots for two seasons. To attempt to obtain fruit from trees lifted from the open ground in the previous autumn is absurd. As a rule, the size of pots in which the trees are grown by the trade varies but little, those of 9, 10, and 11 inches diameter being generally used.

POTTING.—If early forcing is contemplated, the trees should be repotted at the beginning of October. The later trees ought to be potted by the end of October, if possible, otherwise the heavy autumnal rains will render the work inconvenient. Some misapprehension still exists in respect to the annual potting of fruit trees; some hold the idea that this is not essential. It must not be assumed that young trees just received from the nursery, even if looking ever so well, do not require repotting. Without exception it may be considered that for all practical purposes the soil in the pots is greatly exhausted after one season's growth, and the available food assimilated by the plants during that period. True, artificial manures can be given to supply the deficiency, but these, if used to excess, are worse than useless; I do not by any means condemn their use, but they should be used judiciously. I consider it is far better to repot annually. It is our practice to do so, and some nursery-

men make it an invariable rule. I do not say that failure would ensue the first season afterwards if the trees were not repotted, but in the succeeding years there would be great risk incurred, even if artificial manures were used. What should be aimed at is the regular production, year by year, of fibrous roots, rather than those of stouter growth, and this can best be secured by the annual system of repotting. At the annual repotting no plant is put into a larger pot without the mass of soil and roots being first reduced; in fact, it is necessary to exercise great care in the matter of using larger pots. As a rule, we give a larger pot to, say, one plant in twelve, and in every instance it depends upon the vigour of the plant. On the other hand, if a plant shows symptoms of weakness, a smaller pot is used. The reduction of the soil and roots should not be done in a half-hearted manner; if it is decided to replace the plant in a pot of the same size, remove sufficient to allow of the use of a good deal of fresh soil, both around the sides, at the bottom, and upon the surface. As a guide in this work of reducing the root mass, at least sufficient room should be allowed for the hands to be passed freely around between the pot and the former when reduced. A tool with two short teeth is useful for this work. A sharp knife should be used to prune the largest roots. Two or three sizes of soil rammers are required, so as to make the soil as firm as possible; by potting firmly the formation of fibrous roots is encouraged. The results of this will be seen the following season, both in the growth and in the roots too. In finishing off at the surface take care to leave space to hold water, say 1 inch deep. If the tree roots are at all dry at the time of potting, they must be well soaked in a tub of water. Neglect this, let the roots become still drier, and imperfect bud development and bud-dropping will ensue.

TOP-DRESSING.—Top-dressing with good soil affords great assistance to the trees during active growth; this work we like to get done when the fruits are fast developing, say when the size of nuts. It will soon be noticed afterwards that the roots are permeating the new soil. In applying this top-dressing, room is left for watering around the stem; the fresh soil should be built up above the rim of the pot, very firmly, with the hands alone. The surface soil, before the top-dressing is applied, should be lightly disturbed with a sharp-pointed stick. A top-dressing is of great advantage to all fruit trees in pots, in developing both fruits and growth for the ensuing season.

SOIL.—The soil that we use at Gunnersbury is composed of two sorts of loam (loam, it is well known, varies considerably; in some districts, no doubt, it would not be necessary to use other than the local soil). We make use of the Banstead loam, which to a certain extent is calcareous, and mix with it a local soil that contains some iron. These two make a good mixture; the former by itself would be too heavy, the latter being tougher in texture remedies this. These are used in about equal proportions. To the loam we add (at the rate of about one to eight) decomposed stable manure, not old mushroom bed soil. No sand is used, but old mortar rubble well broken up takes its place, and in addition this affords, through the lime it contains, a food essential to the development of all stone fruits. In artificial manures we find this in the phosphates therein employed. For cherries only we add a *small* proportion of artificial



DIVERS' EARLY CHERRY AS A LOT TREE



*PEACH THOMAS RIVERS (ONE OF THE BEST OF RECENTLY
INTRODUCED VARIETIES).*

manure with the soil, the analysis of which reads as follows : nitrogen, 40 to 50 per cent. ; ammonia, 5 to 6 per cent. ; bones and guano phosphates, 32 to 37 per cent., of which 8 to 12 per cent. is soluble ; potash, 2 to 3 per cent. This manure is added to afford immediate aid to the development of the stones, which, in the case of the cherry, takes place directly after the embryo fruits are formed. No stone fruit, I think, passes through the stoning process so rapidly as the cherry. This compost is turned a few times, and afterwards protected from rain, unless it is very dry when mixed. The soil should never be so wet as to cause it to adhere to the hands when potting. Above the drainage we place a handful of half-inch bones and horn shavings, just as these are used in vine borders.

POTS.—Strong, well-made pots are most desirable ; weakly ones, or those not well baked, will sometimes crack during potting ; and, besides, the advantage of a strong pot is very obvious. If the pots are new, let them be well soaked in water previous to use ; if dirty, then thoroughly cleanse them, and let them have at least twenty-four hours' exposure before being again used. As with the pots, so also with the crocks, wash them well ; it is easily done. If broken pots are scarce (they are not often so), then crushed clinkers form a very good substitute to place in the bottom for drainage. We only crock the pots to a moderate extent, space is too valuable for much drainage. Every pot should be provided with side as well as bottom holes for the exit of water.

WATERING, ETC.—After potting water the plants well, and occasionally afterwards, according to the weather. Trees potted early in October require somewhat careful watching if the weather is fine and dry. When warm and sunny use the syringe, in order to prevent the wood from shrivelling, which ought not to take place in the slightest degree. I have known this to occur and the trees to suffer in consequence during the ensuing season. Trees potted early will still retain a fair portion of foliage, thus enforcing the need of syringing. Early in November trees intended for forcing should all be housed, not because they are tender, but in order to prevent the soil becoming too wet. Even then, if fine and dry, the syringe may still be used ; after forcing has commenced, little water will be required at the roots until the buds are swelling. What has to be guarded against is actual dryness at the roots. Trees not forced at all can be left outside all the winter ; the pots should be protected from frost, however, by a covering of stable litter, the plants standing close together, and either upon boards or bricks, so that during heavy rainfall the water can pass away freely. They will not require any more attention until the buds are upon the point of expanding in the spring (unless it is to guard against the depredations of birds). The peach and nectarine trees are then placed in a cool house for flowering, and afterwards moved into other houses as opportunity occurs. The plums, pears, and apples with us remain outside under a temporary shelter, just sufficient to keep off frost and wet. The forced trees do not, as stated above, need much water for some time. Their demands will, however, increase as growth progresses. The secret of success lies in avoiding the two extremes of drought and excess of moisture. When the fruits are swelling quickly and wood growth is active, the trees will require

careful attention. If the weather is fine and warm, watering is a matter of daily importance; the trees will require water frequently twice in the day when the fruits are almost fully grown. Rain water is preferable both for watering and syringing.

LIQUID AND OTHER MANURES.—As soon as the fruits of nectarines, peaches, and plums are the size of a walnut a stimulant may be given, but only moderately (more harm is often done than can be afterwards rectified by an excessive use of either an artificial or a natural manure). For the first month one application in fourteen days is ample; after that, it may be given once every week. An artificial manure should be given alternately with liquid manure. The former should be one of proved efficacy; there are now so many on the market—some good and reliable, while others appear, to say the least, to be harmless. I prefer to use those with which the analysis is fairly given, as it should be. Without one has an analysis of the manure used, it is hardly possible to know which of the many will be most suitable in any given case. A pinch of artificial manure is enough to give to a plant in a 10-inch pot, while for a 12-inch pot, that taken up by the thumb and two fingers is ample (a 12-inch pot holds about twice as much soil as a 10-inch pot). In any case I prefer a finely-ground artificial manure, as it is more readily dissolved in the soil. Bone meal is not, of course, an artificial manure in the correct sense of the term; this may be used rather more freely than any other artificial compound, and frequently it will provide all that is needed. For a liquid manure I prefer that extracted from horse droppings, to which is added a small percentage of soot by placing the latter in a bag, and the bag into the manure tub, there to remain. If worms are at all troublesome, lime water will frequently dislodge them; at the same time this is beneficial to the plants.

FORCING, TEMPERATURE, ETC.—I am decidedly of opinion that the night temperatures in houses containing pot trees of nectarines, peaches, and plums are too high; this is especially before the period of stoning. In many cases a night temperature of 5 degs. less would give better results. If the thermometer at the break of day registers 40 degs. when the trees are in flower, no harm will be done, nor even if it is 5 degs. less in cold weather. It is well known that in the native habitats of these fruit trees, a slight frost frequently occurs when they are in flower, and this may also happen in this country without harm being done. I am inclined to think that the dropping of the flower buds is occasioned, partially, by too high a temperature at night. If a little time is lost, it can afterwards be made up to some extent a few weeks before the ripening of the fruits by earlier closing when the weather is favourable. Damping the floor between the trees is done freely through a rose fixed upon the spout of a water-can. In dull weather this is sufficient, especially when there is no heat in the pipes. When artificial heat is used a slight syringing just before nightfall will be a safeguard against too dry an atmosphere during the long nights. When the fruits are formed and are developing, the syringe is used freely except when the weather is damp, dull, and mild. Too much moisture then will encourage leaf rather than fruit growth. The Cardinal Nectarine is apt to crack when finally swelling if syringed too freely in dull weather; the

remedy is obvious. Peach trees at all times need a drier atmosphere towards nightfall than do nectarines or plums, because moisture is retained by their woolly skins much more than by the smooth surfaces of the nectarine and plum. After all the fruits are gathered, it is not possible to use the syringe too freely, especially if trees are infested with injurious insects.

THE TREES AFTER FORCING.—As soon as the foliage has been hardened by means of a lower temperature, the trees are placed outside, plunged to the rims of the pots in the garden border, with two bricks under each pot, and a few cinder ashes around the drainage holes to keep out worms. Two feet space between the pots is allowed; a little more room should be provided if necessary to enable the watering to be properly attended to. Until the end of September the hose is used freely, but not strongly. This will assist in keeping the foliage fresh and clean. When the trees are lifted for potting it will be frequently noticed that the roots have grown through the holes in the pots.

INSECT PESTS.—Pot fruit trees do not suffer so much from the attacks of insects as do trained trees. Both the upper and lower surfaces of the leaves of the pot trees can be reached more readily with the syringe. This is the chief means employed to keep down the red spider pest. To destroy aphides we find nothing equal to the XL-All vaporizer. This same remedy will also kill grubs upon the plums, cherries, pears, or apples, so that hand-picking may be completely dispensed with so far as pot trees are concerned. Scale does not cause any trouble, nor does the mealy bug. We always use XL-All immediately a house is closed for forcing, and again, if necessary, when the buds are about to expand, and later as is required. Thrips are also destroyed by the same remedy.

CANKER.—I think pot-grown trees are almost immune from canker (and, in fact, from other diseases also). It occasionally makes its appearance upon the cherries, but very rarely. The freedom from canker points very clearly, in my opinion, to the good effects of the annual repotting. More often than not, I consider this disease is the outcome of a too luxuriant growth, and the too free use of the pruning knife in consequence. Take cherries, for instance; where the choice varieties fail in the open or upon walls, I unhesitatingly recommend pot culture, even if carried on under a netting screen only.

PRUNING.—If late growths are seen that will have no chance of ripening, we cut them off when repotting, or in the case of forced trees, when taking them under glass. A slight pruning, merely removing shoots that are not required, and the shortening of others, is attended to at the time of starting the forced trees. In the case of late autumn fruiter, when these are housed in the spring, most of the pruning is done after the fruits are formed, and when they are seen to be growing freely. This pruning takes the place of dis-budding as usually practised with trained trees. By this means, and by cutting back every shoot to the wood-bud next above the fruit, or to a promising young growth, the trees are easily kept within bounds. When the shoots of the current year are of sufficient length they are stopped, and again, later on, at a few leaves distant if necessary. Great care is taken in pruning not to leave any wood so that it may afterwards die back. We cut close to the growing shoots,

and the cuts in nearly every case heal over. Occasionally, some regulation of the shoots is necessary ; this can be done by tying. A stake to a tree will, at times, be an assistance in keeping it erect ; again, a slender stick only will be needed to keep the leader straight. Lateral shoots are not encouraged except to replace any failures, or when a tree is being rapidly developed.

CROPPING, THINNING THE FRUIT.—The number of fruits to be borne by the tree will depend upon its vigour, its size, and the size of the pot. As a rule forced trees ought not to ripen quite so many fruits as those not forced. Trees in 12-inch pots will carry from twelve to fifteen fruits easily. Those in 10-inch pots may bear six to eight fruits. Larger trees, standards with bushy heads, in 13 or 14-inch pots, will ripen from fifteen to twenty fruits. A tree that has borne a heavy crop for two or three consecutive seasons should have a rest by being allowed to mature a light crop only. It is a good plan to label each tree with the number of fruits it last produced as a future guide and for comparison. We do not thin the fruits too freely at first, for the simple reason that we dread the London fogs ; these often do the thinning for us, and far too freely. The final thinning is done when the stone is hardening, and when it is clearly seen by the character of the fruits that they are fairly safe. As the fruits are seen to change colour they are exposed as much as possible to the light, but not until the first fruits are ripe do we alter the treatment as regards ventilation ; then the house is kept slightly cooler and the atmosphere more buoyant by the ventilation being continued day and night. For gathering the fruits a pair of strong vine scissors is much better than performing this operation (with force in some instances) by the hand only. Take Early Rivers Nectarine, for instance. The base of this variety often grows back upon the wood, and the slightest twist when ripe will cause a bruise. The assistance of the scissors, so as to cut off the fruit with its stalk, will avoid this. With a little practice this method will recommend itself.

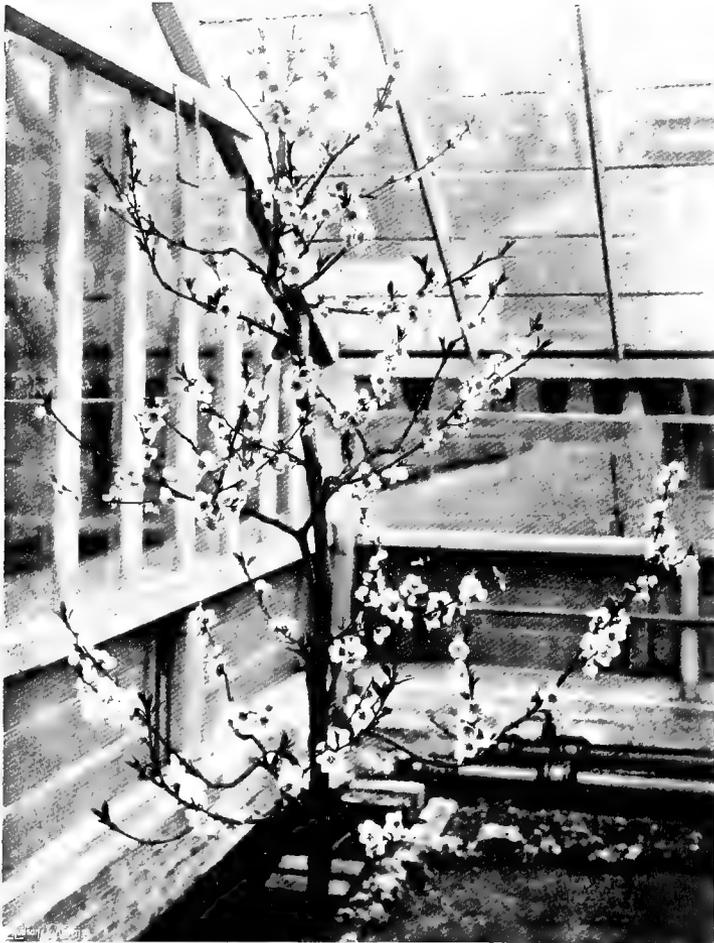
LONGEVITY OF THE TREES.—The question is often asked, “Do not pot fruit trees soon die, or soon become practically useless ?” The answer to these inquiries is, “Not at all ; in fact, just the contrary !” Confirmation of this can readily be obtained at Sawbridgeworth, where for more than a quarter of a century some of the trees have been exclusively grown in pots. (See illustration.) Pot culture, rather than leading to premature decay, has generally quite the opposite effect.

The culture that has thus far been detailed will apply to nectarines, peaches, cherries, plums, pears, and apples. In the case of figs and the Citrus family, as represented by the orange, lemon, citron, &c., somewhat different treatment is necessary.

FIG CULTURE IN POTS.—It is sometimes remarked that fig trees, particularly some varieties, have a tendency to bear only partial crops of fruit. Grow them in pots, however, and any such illusion will be quickly dispelled. We do not repot these every season, but, as a rule, carefully remove the surface soil one season and repot the next. The earliest forced trees are potted in August, and the late ones in November, or as soon as they have ceased to fruit, which in the case of some is not until about Christmas. None of these, however, is left



*NECTARINE VICTORIA (ONE OF THE BEST LATE
VARIETIES) AS A POT TREE.*



POT PEACH TREE (DR. HOGG) IN FLOWER.

outside during the winter, but stored in a dry, airy house thoroughly to ripen the wood. The early trees are started on November 1; these produce ripe fruits from the 1st March onwards, sometimes a week earlier. The latest trees, on the other hand, are retarded as much as possible to prolong the season; in the spring, about the end of February, these are laid down out of doors in the most sheltered spot available, remaining there until the middle of April, when they are placed upright and watered, at first quite sparingly. As space is available they are brought under glass again, so that by the middle of May all are together under cover. The soil is slightly varied for figs, less manure being used, but in its place more lime rubble is added. It is for first and second early crops and for late crops that the pot culture of figs is recommended. Figs in pots succeed better if the pots are partially plunged. This practice minimises the work of watering, besides which the plunging material affords a rooting medium that is readily taken advantage of. The pot culture of figs is commendable because so many more varieties can then be grown than when the trees are planted in borders and trained over a large area. For first early forcing no variety in pots can compare with *St. John's*, which is practically identical with *Pingo de Mel* (where one is grown, the other need not be). To follow *St. John's* nothing will surpass *Brown Turkey* and *White Marseilles*. The later sorts will follow these, such as *Bourjasotte Grise*, *Bourjasotte Noire*, *Negro Largo*, *Violette Sepor*, *Nebian*, and *D'Agen*, the last-named being the latest fig grown. The *White Ischia*, quite a miniature fig, is well worth growing in pots; it is most prolific and of delicious flavour.

THE ORANGE, LEMON, AND ALLIED FRUITS.—All these may be treated alike, and it may be taken that the soil recommended for such as peach, nectarine, and other trees, will also suit in these instances, except that more lime or mortar rubble should be added. It is much to be deplored that the cultivation of these useful and ornamental fruiting trees is practically non-existent in this country. In no sense are they difficult to grow in cool houses, and they are always admired when well fruited. On the Continent they are grown in tubs of excessive size. These are not necessary if good soil is used, firm potting practised, and care taken not to neglect the watering. Being evergreens they will not bear much dryness at the roots, while for the same reason only occasional repotting is advisable. Scarcely any pruning is needed. Just the strong shoots should be checked so that they do not rob the weaker ones. The greatest insect enemy of these trees is the scale, which, however, can be easily kept down with the XL-All plant wash or insecticide, not the vaporizer.

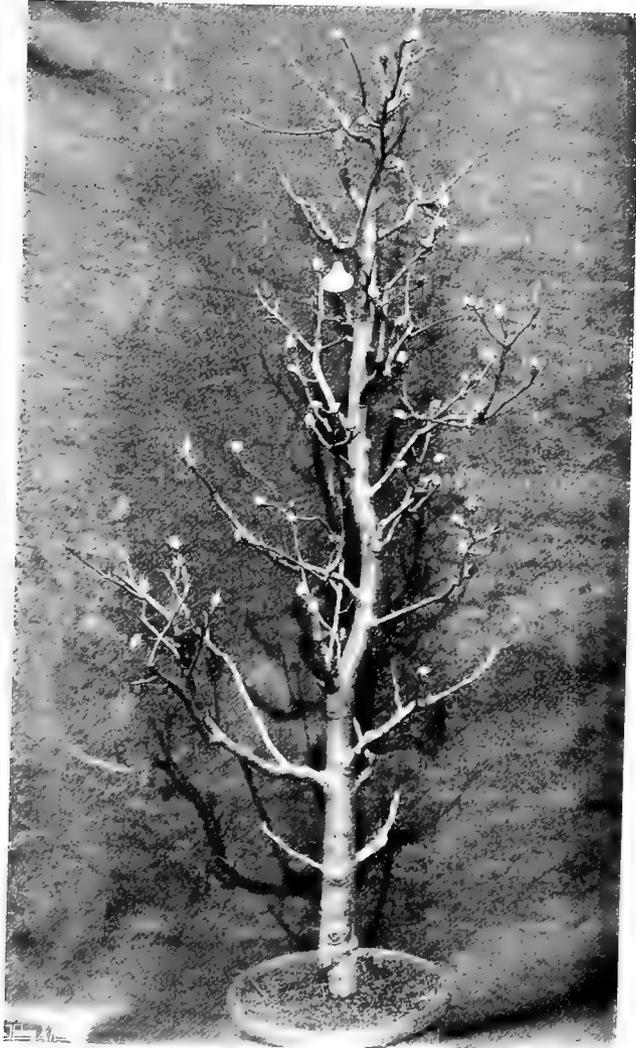
NECTARINES.—*Cardinal* (Rivers') is beyond question the best first early variety for pot culture, either for first early forcing or for ripening naturally. It is not recommended by the raisers for planting out-of-doors; with a properly prepared border, however, I consider it safe to plant as a trained tree under glass. It is fully twenty days earlier than *Lord Napier* under exactly similar conditions of culture. The fruits "set" freely, and their colour is denoted by the name. *Early Rivers* succeeds *Cardinal*, being about ten days later. It is a larger fruit when ripe, and altogether an excellent variety. It is most reliable when the trees are started at the new year. *Lord Napier* and *Advance*: two

first-rate varieties, the former the better known of the two; but if I had to choose between them I should prefer the latter for pot culture. *Dryden*, *Byron*, *Improved Downton*, *Goldoni*, *Rivers' Orange*, *Pine-Apple*, *Humboldt*, *Newton*, *Spenser*, *Victoria*, and *Albert Victor*, are all of proved excellence and of good quality; the two last-named are the best late varieties.

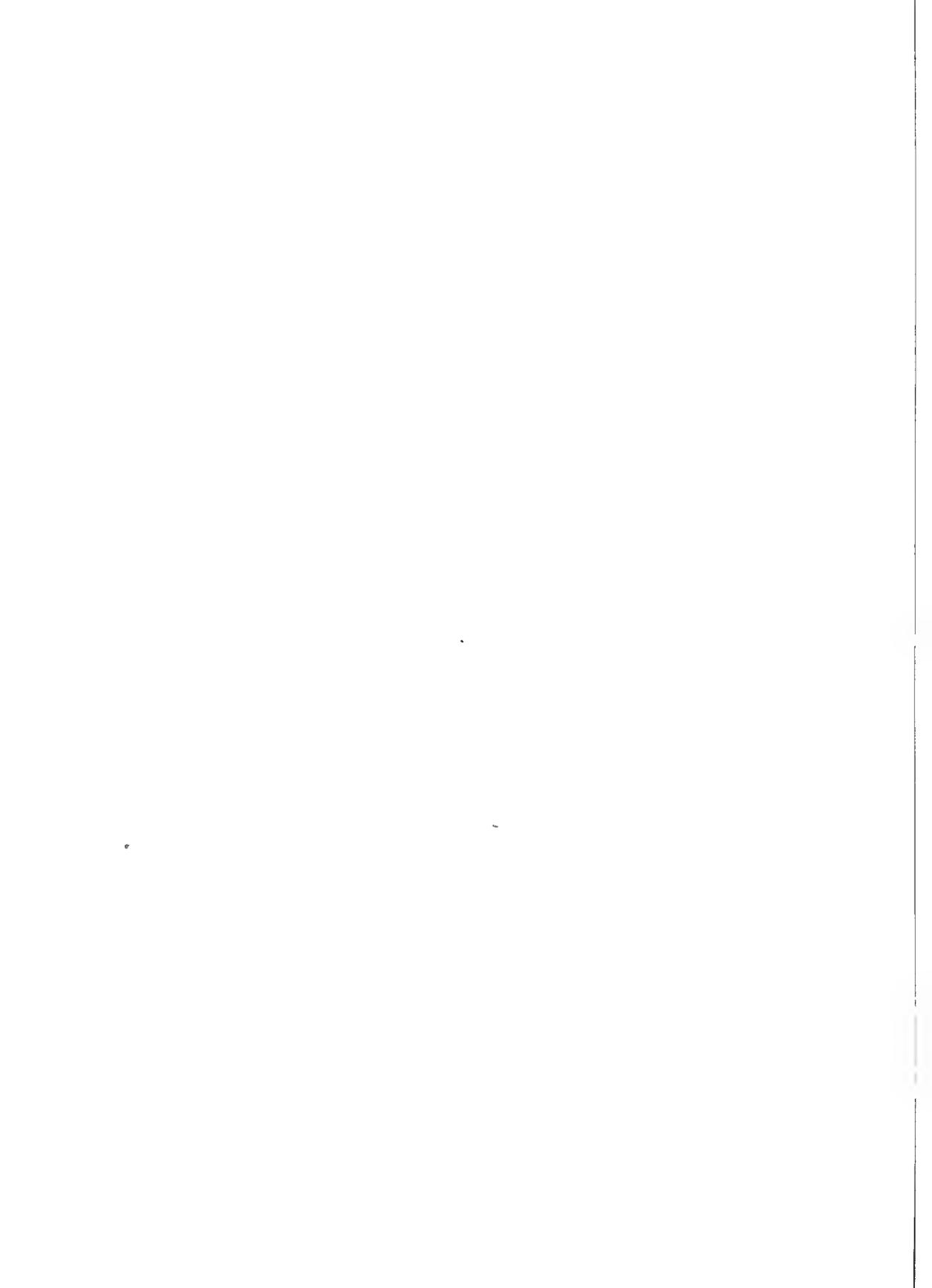
PEACHES.—Until recently, we have not had so reliable a peach for early forcing in pots as Cardinal is among Nectarines; but now I am convinced, after two seasons' trial, that an acquisition in this respect has been introduced, viz., the variety *Duchess of Cornwall* (formerly called *Duchess of York*). It ripens a few days perhaps after Amsden June, but it is infinitely better in that it is a reliable cropper, sets freely, and, what is still more in its favour, it is not a "bud dropper" in any sense of the term. *Waterloo*, *Alexander*, and *Amsden June* can still be grown if the trees are allowed to burst into growth naturally, but as a succession to *Duchess of Cornwall* I prefer to depend upon *Hale's Early*, which on the whole does not drop its buds so much. *Early Grosse Mignonne* follows this, but *Rivers' Early York*, which is a better cropper, is only a few days behind it. Then we have such well-known sorts as *Dr. Hogg*, *Crimson Galande*, *Dymond*, *Stirling Castle*, *Goshawk*, and for the latest, *Sea Eagle*, *The Nectarine Peach*, *Golden Eagle*, and *Osprey*. (I do not recommend either of the well-known old peaches, *Royal George*, *Noblesse*, *Early York*; they are superseded by *Dymond*, *Alexandra Noblesse*, and *Rivers' Early York* respectively. These latter are not at all liable to mildew.)

PLUMS.—Not until I had actually tested the adaptability of the plum to pot culture did I believe it possible to obtain such satisfactory and reliable results. The earliest of the best dessert varieties can be forced as easily as the nectarine, and may be had ripe for dessert from the middle of May onwards, a succession being maintained without any difficulty. The best for forcing we find to be: *Early Transparent Gage*, *Reine Claude du Comte Hathem*, *Jefferson*, and *Kirke's*, all of which are excellent and of recognised good quality. *Early Prolific* also forces well, being really the earliest of all to ripen; as a pot plum it is also of better quality than when planted out-of-doors. During the London season these plums are an invaluable adjunct to the dessert. For fruiting in pots without forcing the following are of proved excellence, viz.: those already named for forcing and *Golden Transparent* (the most handsome plum in cultivation when grown in pots and ripened under glass, and of the finest flavour), *Transparent*, *Late Transparent*, *Golden Esperen*, *Oullin's Golden Gage*, *Old Greengage*, *Reine Claude de Bavay*, *Coe's Golden Drop*, *Ickworth Impératrice*, *Bryanston Gage*; we also grow in pots *Monarch* and *Grand Duke* (both valuable for their colour); also *Decaisne*, *Late Rivers*, and *Late Golden* for their late ripening and keeping properties. A strong point in favour of plum culture in pots is the perfect finish obtained in the fruits, owing to the shelter from rain and the protection from birds and insect pests.

CHERRIES.—In starting to grow cherries in pots for forcing we had no reliable data to work upon, hence we had to find out by practice which sorts were best adapted to the object in view. After several seasons we have proved now that the earliest dessert cherry to ripen is *Guigne d'Annonay*, a black variety



A TYPICAL POT PEAR TREE.



of medium size and of excellent quality and productiveness ; it ripens ten days earlier than either Bigarreau de Schrecken or Early Rivers : of these two varieties we find the former the more reliable for forcing. As regards size it is a grand fruit, intensely black, very juicy, and of rich flavour. Early Rivers comes in splendidly if the trees are allowed to flower naturally under glass, the fruits are then a few days earlier than the earliest outdoor fruits ; next in order come *Governor Wood*, *Frogmore Early Bigarreau*, *Belle d'Orléans*, and *Black Tartarian*. All these should be included even if forcing is not attempted, and the following added : *Bigarreau Napoléon*, *Bigarreau Noir de Guben*, *Bigarreau Noir de Schmidt*, *Elton*, *Monstrueux de Mezel*, and for the latest, *Emperor Francis*, *Florence*, and *Géant de Hedelfinger*. It should be noted, in the forcing of cherries in pots (or otherwise), that *the trees must not be hard forced*. This I have conclusively proved. Cherries will practically fail if given the same treatment as peaches. There should be as much difference in the temperatures of these fruits as in those of vines and peaches. This means that when the trees are in flower the night temperature of the houses will range from 40 to 45 degs. Fahr. Ventilation should be constant except in the very worst weather. The May Duke cherry in pots is extremely useful, on account of the abundance of pollen the flowers possess ; it is well worth growing for that purpose alone, to enable one to fertilise the flowers of varieties less favoured in this respect.

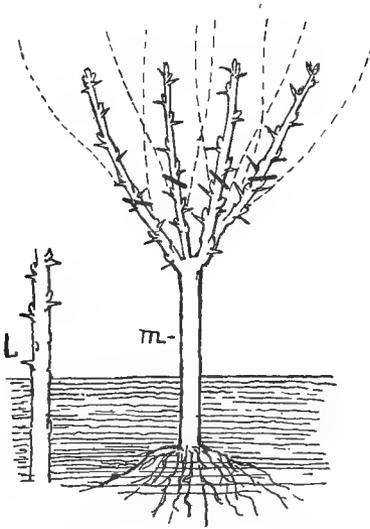
PEARS.—These do not enter so extensively into the category of pot fruits as any of the preceding. They are, nevertheless, very useful and most ornamental. Only the best of the dessert sorts should be grown. The earliest varieties are not so desirable as those that will keep well. The following are recommended as being satisfactory in pots : *Fondante d'Automne*, *Beurré Superfin*, *Triomphe de Vienne*, *Louise Bonne of Jersey*, *Thompson's*, *Glou Morceau*, *Doyenné du Comice*, *Pitmaston Duchess*, *Durondeau*.

APPLES.—As in the case of pears, it is better to grow only the choice varieties, such, for instance, as *Ribston Pippin*, *Cox's Orange Pippin*, *Washington*, *King of Tompkin's County*, *Mother Apple*. The large fruits of *Peasgood's Nonesuch*, *Alexander*, and other sorts, look extremely well upon the trees, but for quality are not desirable.

CHAPTER VIII

THE GOOSEBERRY

By GEORGE BUNYARD



RAISING FROM CUTTING AND FORMING
GOOSEBERRY BUSH

- (1) Cutting of strong, well-ripened shoot, cut transversely below a joint, the top shortened so that the cutting is 10 to 12 inches long, all eyes and spines removed to a height of 6 inches from the base, three or four (as in the sketch) buds left at the upper part to form branches. Insert firmly in the soil 4 inches deep in autumn; if many are inserted the cuttings should be 6 inches apart in the rows, and the rows 1 foot asunder, leaving out every fifth row, thus forming beds; (m) one-year-old bush marked for pruning (cross lines) each shoot to about four good buds, the object being to originate two vigorous growths from each branch. The bush may be started with three branches; dotted lines indicate eight branches formed.

ened, so that ultimately a bush,

THIS flourishes in all garden soils, but thrives best in districts where the air is tempered by cool nights, heavy dews, and frequent rains. Gooseberries are very gross feeders, and will benefit by applications of the strongest manures, as fish refuse, fish and meat guano, pig and cow manure, which, if dug well into the ground before February, add both to the size and quality of the fruits. When the bushes are planted in gravelly or sandy soils a mulching of fresh stable manure applied in March will greatly benefit them, and during a dry spring and summer will keep the surface of the ground cool and moist, and thus prevent its cracking. Neither will the fruits be disfigured and damaged by soil splashed up by heavy rains.

PRUNING.—If gooseberries are planted before Christmas it is best to cut back the shoots, say, to three or four buds, and in the case of upright growing varieties prune to a bud pointing outwards; but with gooseberries of a weeping habit of growth, the outside or lower branches should be cut to a bud pointing inwards, to encourage the shoots upwards, otherwise the berries may be spoilt by soil splashed up in wet weather. The shoots resulting from this pruning should be trained so as to form the shape of a basin; remove all useless shoots, cutting them back to three buds. Should the bushes not make enough shoots the first year to form a good base, the few will be naturally strong, and should be again shortened, with regularly disposed branches, may be

formed. For garden trees all side shoots can be pinched back to three buds, so as to form spurs along the principal branches, and the leading shoots can be cut back a little year by year, in order to secure a shapely and well-balanced bush, but they may be left the full length when the bushes are formed. The side shoots on cordon and other trained trees should also be shortened to three eyes in order to form spurs on the branches. This pruning will cause fruit buds to form on the lower parts of the shoots, and will eventually result in the main boughs being provided with fruit buds along their entire length. The leading shoots are left untouched.

MARKET CULTURE.—Gooseberries when grown for market are hard pruned for two years to form the bushes, and subsequently the long shoots are left their full length. The bushes must be severely pruned, if necessary, to prevent shoots crossing each other and to leave ample room for the pickers to reach the fruit without being inconvenienced by the prickly stems. Care should be taken to prune them so that the principal branches are well away from the ground; small and ill-formed berries will then be very rare, and quality is a most important factor when fruit has to be profitably disposed of. This severe pruning causes the bushes to make strong, stout shoots, and a constant supply of young wood, upon which the best berries are produced. Those



SPURS

(r) Forming, but not bearing; (s) producing fruit, and forming a continuation spur.



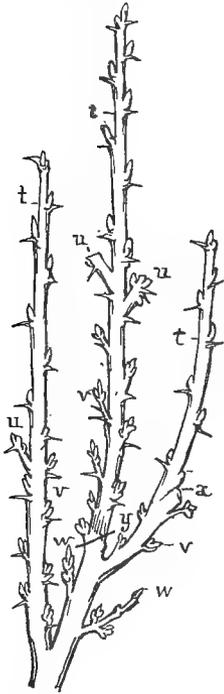
BRANCH OF GOOSEBERRY SHOWING MODE OF GROWTH AND FRUITING

(n) Fruit produced from wood of preceding year's formation; (o) spurs (short stubby growths with several leaves and buds) upon which fruit is borne the following season; (p) side shoots that may be retained if required for furnishing branches, or pinched at about the fifth leaf when not wanted for that purpose, and in the autumn following cut back to a bud or two from base; (q) extension of branch growth that may be stopped at about 1 foot if growing too vigorously, and in winter shortened to 6 or 8 inches, if strong.

VARIOUS METHODS

OF TRAINING.—During recent years excellent standard gooseberry trees have been produced, grafted on the stems of *Ribes aureum*. They form compact heads, which are smothered with fruits; and as these are quite away from the ground, they are free from grit, clean, and easy to gather. The stems of standard trees are from 2½ to 5 feet high, although the latter are rather too tall. Cordon goose-

berries are very fruitful, and if at the July pruning the side shoots are pinched



PORTION OF BRANCH TO SHOW METHOD OF PRUNING BRANCHES

(*t*) One year's growths bearing some fruit forming spurs, and continuation growth with some side shoots in following summer; (*u*) points on two years' wood where side shoots have been spurred in, or cut to about an inch from base; (*v*) spurs on two years' wood that must be retained for bearing; (*w*) short growth on three-year-old wood—it is often desirable to leave this in order to afford succession branches to those cut out; (*x*) point where a shoot has been cut out to prevent crowding; (*y*) point where a branch may be cut out when it becomes weakened and worn out by bearing, in favour of a promising shoot.

ment buds, and thus might spoil the crop also.

at every fourth leaf they bear wonderful crops. This form of training is used to fill vacant spaces on walls and for planting against wire trellises; in either case they can be easily netted if birds are troublesome. Fan-trained, "U"-shaped, or palmette (toasting-fork) trained are pretty forms for trellises or walls; a few of these should be planted in warm situations for early picking, and also on north walls, where the fruits may be gathered as late as September, and are then much appreciated.

In the Midlands and the North, goose-berry shows are held, at which enormous fruits are exhibited. These are obtained by syringing the trees frequently in dry weather, keeping the soil moist by covering it with chickweed or some low-growing herb, and by liberal feeding at the roots with liquid manure. When the fruits are developing, all except a few of the best shaped ones are removed. This method of culture, however, constitutes merely a hobby, for a moderate-sized berry for dessert purposes is far preferable. Except for exhibition, thinning the fruits is sufficiently carried out by removing a portion of them for cooking in a green state.

BIRD ENEMIES.—Where bullfinches and sparrows injure and destroy the buds of the trees, it is a good plan to tie up the bushes and prune them early in March. Upright-growing varieties are less attacked than those with drooping shoots, as the birds readily settle on the latter, and very prickly sorts are safer. A dressing of soot, lime, and new milk syringed on the trees in November in dry weather will often protect the buds. Where bullfinches and sparrows are numerous, pruning is best deferred until March; the birds select the most promising shape of the young trees and reduce

THE BEST GOOSEBERRIES

We have thought it best to divide these into two classes. The first section contains those with small berries, which are esteemed for their superior flavour ; and the second section comprises the large, handsome berries commonly called Lancashire Prize Gooseberries, which are excellent for dessert if gathered at the right time ; as a rule, however, they lack the distinct rich, sweet flavour of the smaller fruits. Both may be used for cooking purposes, and by thinning the



A SHOOT BEARING FRUIT

- (z) Point of stopping at about the fifth leaf ;
(a) point of pruning in winter to form spur in following summer.



GROWTH (STOPPED) FROM A SPUR, LEAFLESS

- (b) Point where pinched in summer ; (c) laterals ; (d) point of shortening at winter pruning ; (e) spur.

Lancashire sorts when the fruits are young and green, the remaining berries will become very large.

The fruits of other colours than red are rather difficult of classification, as the whites, greens, and yellows merge into one another as they ripen ; but for purposes of selection they are placed according to their prevailing colours.

I.—SMALL-FRUITED

GREEN FRUITS

GREENGAGE OR EARLY GREEN HAIRY.—*Growth* upright and free ; great bearer. *Fruit* dark green, veined, mottled white ; *flavour* rich ; *skin* thin.

GLENTON GREEN.—*Fruit* medium sized, hairy, grass green, with white veins ; *flavour* rich, sweet ; free bearer ; tree short-jointed.

GREEN GASCOIGNE.—*Growth* free and upright ; *fruit* milk white and pale green, with white hairs ; a first-class variety ; profuse bearer.

GREEN HEDGEHOG.—*Growth* upright ; prickly ; *fruit* greenish white, with white hairs, oval ; *skin* thin ; *flavour* first-class.

LANGLEY GAGE (VEITCH'S), A.M. 1896.—*Fruit* deep green, with white veins ; *skin* thin ; *flavour* first-rate ; profuse bearer.

ROSEBERRY.—*Growth* free, spreading ; *fruit* deep olive green, shaded, slightly hairy ; *skin* thin ; *flavour* very good.

RED FRUITS

DOBSON'S SEEDLING.—*Growth* moderate ; very prickly ; *fruit* deep blood red, shaded light red ; *flavour* good ; an enormous bearer.

IRONMONGER.—*Growth* upright ; *fruit* small, flattened, hairy, deep blood red ; very rich, and good for bottling.

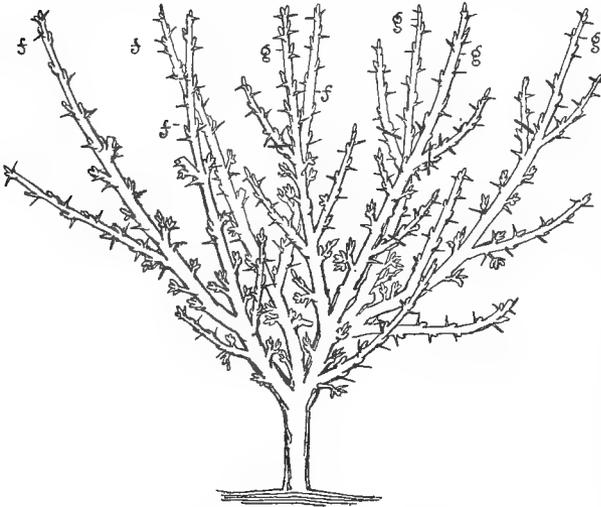
KEEN'S SEEDLING.—*Growth* compact and very prickly ; *fruit* resembles Warrington, but larger, and hangs late, hairy, bright red.

RED CHAMPAGNE.—*Growth* upright ; *fruit* very bright red ; nearly smooth ; *flavour* rich and brisk.

SCOTCH RED ROUGH.—*Growth* compact ; very free bearer ; *fruit* small and hairy ; good for bottling ; *flavour* rich and brisk.

SUPERB.—*Growth* compact ; great bearer ; *fruit* deep blood red, shaded, hairy ; *flavour* good.

WARRINGTON (Aston Red).—*Growth* compact ; *fruit* bright red, hangs late ; *flavour* very rich and brisk ; good for late supply on walls or in shaded spots.



BUSH, FOUR YEARS OLD FROM CUTTING

(f) Pruned main branches, all side growths spurred in to two buds, and promising growths left for extension of bush ; (g) branches not pruned, but marked for pruning.

deep golden, with white veins ; *skin* thin ; *flavour* excellent ; very free bearer. F.C.C. 1897.

YELLOW FRUITS

CHAMPAGNE YELLOW.—Closely resembles Golden Drop (which see).

GOLDEN DROP.—*Growth* upright ; *fruit* almost transparent, oval-shaped, hairy. When ripe a bright amber colour. The earliest to ripen.

GOLDEN LION.—*Growth* upright ; *fruit* round, almost smooth, bronzy yellow ; *skin* thick ; *flavour* very rich ; keeps late.

YELLOW BALL.—*Growth* upright ; *fruits* shaded yellow and orange, almost bronze, very small but delicious ; *skin* smooth.

YELLOW SULPHUR.—*Growth* upright ; very like Golden Drop.

GOLDEN GEM.—*Fruit*

WHITE FRUITS

BRIGHT VENUS.—*Growth* upright ; *fruit* almost transparent when ripe ; *flavour* very sweet and rich.

CHESHIRE LASS (White Shiner).—*Growth* upright ; *fruit* white when young, transparent when fully ripe showing seeds ; *flavour* rich and sweet ; *skin* thin.

WHITESMITH (Velvet White, Eagle, White Eagle, or Snowdrop).—*Growth* strong,

upright, thorny ; one of the earliest to pick green ; *flavour* quite first-class ; *fruit* large, downy.

COLUMBUS (American).—This has proved to be the Whitesmith of our gardens.

II.—LARGE-FRUITED (LANCASHIRE)

RED FRUITS

BEAUTY.—*Growth* drooping and free ; *fruit* very large, pink, and shaded with deep red ; a good bearer.

BOBBY.—*Growth* drooping ; one of the largest ; *fruit* pale brownish red, often blood red ; *flavour* rich, brisk ; early.

CROWN BOB.—*Growth* strong, arching ; *fruit* large, with very thin *skin*, and of the finest *flavour*. Can be picked early in a green state.

CLAYTON.—*Growth* drooping ; *fruits* long, dark reddish purple, with broad veins ; late.

COMPANION.—*Growth* strong, great bearer ; *fruit* dull red ; veins paler ; keeps well (on trees) ; *skin* thick.

DAN'S MISTAKE.—*Growth* erect and free ; *fruit* rich crimson, red, and pink ; white veins ; keeps late (on trees) ; *skin* thick ; *flavour* good.

DUKE OF SUTHERLAND.—*Growth* drooping and slender ; *fruit* light red, shaded with grey ; late.

LORD DERBY.—*Growth* drooping ; one of the best ; *fruit* handsome, deep red ; *skin* thin ; *flavour* very sweet.

LANCASHIRE LAD.—*Growth* compact, arching, prickly ; *fruit* deep red, shaded light red, almost smooth ; a great favourite for market both green and ripe ; bushes can be planted 5 feet apart.

LONDON.—An awkward grower. Requires support ; rather tender in low situations ; *fruit* very large, deep purplish red.

NAPOLEON THE GREAT.—*Growth* free ; moderate cropper ; *fruit* very handsome, bright scarlet, and of good *flavour*.

PRINCE REGENT.—*Growth* spreading ; *fruit* dark red, large.

RIFLEMAN.—*Growth* upright, vigorous, making a large bush ; *fruit* bright red, hairy ; *flavour* good ; a suitable variety for late market.

SPEEDWELL.—*Growth* moderate, erect ; *fruit* large when well thinned, deep crimson red ; *skin* thin ; early.

WHINHAM'S INDUSTRY.—*Growth* upright, prickly, vigorous ; great bearer ; *fruit* carries well to market when ripe ; late.

Other varieties are :—Conquering Hero, England, Falstaff, Guido, Roaring Lion, Wonderful.

WHITE FRUITS

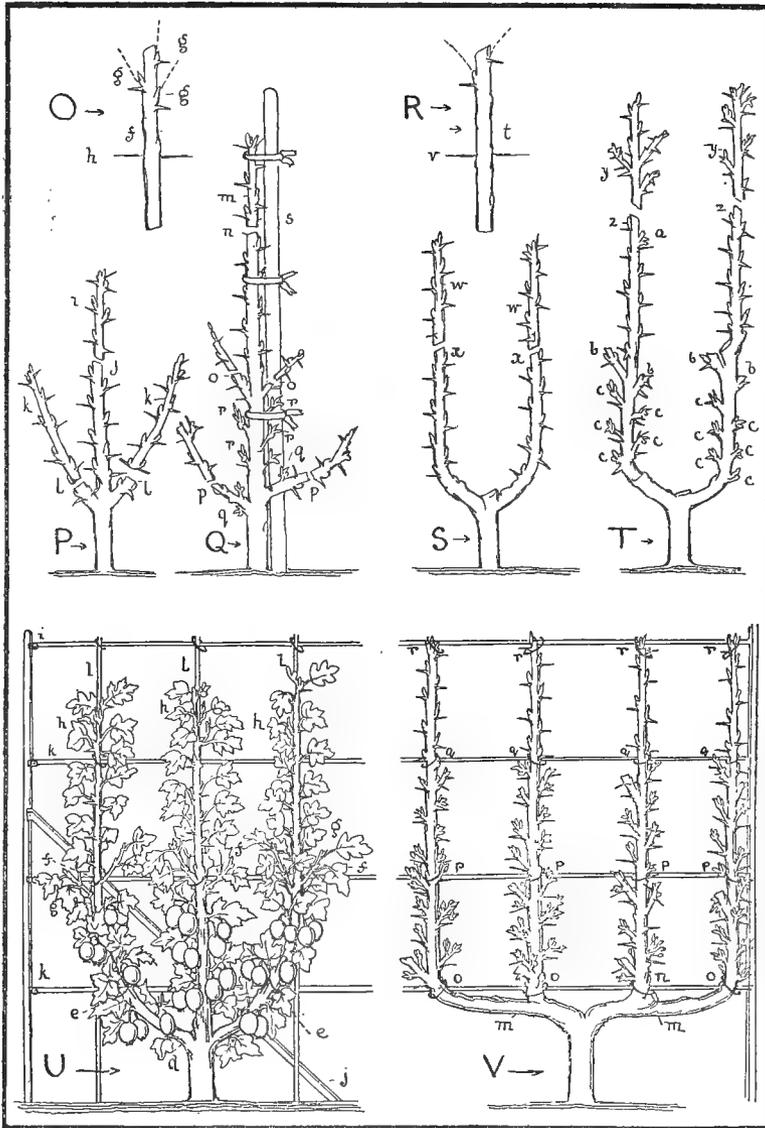
ANTAGONIST.—*Growth* drooping, the largest white gooseberry ; *fruit* creamy white with green veins ; *flavour* excellent.

ALMA.—*Growth* free ; *fruit* blotched with snow-white and pale green, handsome ; *skin* thin ; *flavour* very sweet.

CARELESS.—*Growth* free ; slender ; great bearer ; *fruit* large, creamy white with white blotches and veins, handsome ; of the finest *flavour*.

FREEDOM.—*Growth* good ; *fruit* long, green, veined white, early ; *skin* thin ; rich sweet *flavour*.

KING OF TRUMPS.—*Growth* moderate ; *fruit* dull greenish white ; early and large.



PRUNING AND TRAINING CORDON GOOSEBERRIES.



GOOSEBERRY BRIGHT VENUS (reduced).



GOOSEBERRY IRONMONGER (reduced).



A STANDARD GOOSEBERRY.

LADY LEICESTER.—*Growth* upright; *fruit* has a golden tinge when ripe; *flavour* very good. F.C.C. 1901.

LANCER, HOWARD'S.—*Growth* free; one of the largest and best gooseberries; superb in flavour and appearance. F.C.C. 1901.

OVERSEER.—*Growth* vigorous; a good mid-season variety; *fruit* creamy white, well flavoured.

POSTMAN.—*Growth* moderate, free bearer; *fruit* snow-white with green veins; *flavour* very good.

SHINER.—*Growth* free; *fruit* of the very largest, blotched with white at base; veins very marked.

SMITH'S NONPAREIL.—*Growth* upright; *fruit* downy, pale greenish white; a late berry; *flavour* good.

TRANSPARENT.—*Growth* upright; *fruit* palest green with white ribs; *flavour* very good; late and very large.

WHITESMITH OR VELVET WHITE.—*Growth* upright, prickly; *fruit* downy, good to pick early, and of splendid *flavour* when ripe.

Other good sorts are:—Faithful, Fascination, Hero of the Nile, Queen of Trumps, Tally Ho!

GREEN FRUITS

ADMIRATION.—*Growth* free; *fruit* green with white veins; *flavour* good.

BRITISH QUEEN.—*Growth* free and erect; *fruit* richly flavoured.

GREENOCK.—*Growth* upright, good bearer; *fruit* bright green; *flavour* good.

OCEAN.—*Growth* free and strong, drooping. Very fine mid-season gooseberry.

PHILIP THE FIRST.—*Growth* upright; a handsome fruit, ripening late.

PLUNDER.—*Growth* upright, but spreading; *fruit* pale green and white; *flavour* good.

PRUNING AND TRAINING CORDON GOOSEBERRIES

SINGLE CORDON.—O. Cutting; straight shoot of last year's growth about 1 foot in length—properly prepared and inserted; (*f*) part from which buds are removed; (*g*) upper buds left; (*h*) depth of inserting firmly in soil—about 4 inches deep—the dotted lines indicating direction of growth, from buds in following spring. P. One-year-old plant; (*i*) leader; (*j*) point of shortening leader in winter; (*k*) side shoots; (*l*) point of shortening side shoots to within 1 inch of their bases to form spurs. Q. Tree, first year of training; (*m*) leader; (*n*) point of shortening leader in winter, not leaving more than 1 foot or thereabouts of last summer's growth; (*o*) side shoots shortened to within 1 inch of base; (*p*) cut-back growths shortened to within 1 inch of base; (*q*) spurs formed by shortening side branches; (*r*) spurs formed naturally in previous summer; (*s*) stake to which leading growth is trained to keep it erect.

DOUBLE OR "U" CORDON.—R. Cutting; (*t*) part from which buds are cut off; (*u*) two buds retained; (*v*) ground level; dotted lines indicate growths from buds in following spring. S. One-year-old tree; (*w*) leaders; (*x*) points of shortening leaders at winter pruning. T. Two-year-old tree; (*y*) leaders on which laterals, if any, have been pinched to one leaf, as shown in upper part; (*z*) point of shortening leaders in winter; (*a*) point of shortening a lateral (stopped in summer) to within a bud of its base; (*b*) point of shortening side shoots, which in summer have been pinched to five leaves; (*c*) spurs.

THREE-BRANCHED OR "TOASTING FORK" CORDON.—U. Three-year-old tree in growth; (*d*) point where one-year-old tree (P) was shortened at winter pruning; (*e*) points where side shoots were shortened in first year; (*f*) point of second winter shortening of leading growths; (*g*) side shoots pinched at fifth leaf, and to be cut to within 1 inch of base at winter pruning; (*h*) leaders pinched at 15 inches of growth, laterals on them to one leaf, and leaders shortened to 1 foot at winter pruning.

TRELLIS.—(*i*) Straining pillar with winders; (*j*) stay; (*k*) wires 1 foot apart; (*l*) temporary wires for training the growths perfectly upright.

FOUR-BRANCHED OR DOUBLE "U" CORDON.—V. (*m*) Point of first shortening two-branched one-year-old tree, thus originating two strong growths trained erectly, in the autumn the lower on each branch is brought down and shortened; (*n*) upright shoots cut to one or two buds; (*o*) side shoots to a bud above bend, thus starting the growths on a level; (*p*) points of third pruning; (*q*) points of fourth pruning; (*r*) points of fifth pruning, the tree then being fully formed and properly pruned.

STOCKWELL.—*Growth* slender ; a very good mid-season variety, bright green with white veins.

TELEGRAPH.—*Growth* upright ; *fruit* very handsome, olive green, veined white ; late ; *skin* thin ; *flavour* excellent.

THUMPER.—*Growth* moderate and drooping ; *fruit* handsome, sometimes has a red tint.

Other good sorts are :—British Oak, Cheerful, Diadem, Lancelot, Overall, Sir George Brown, Surprise.

YELLOW FRUITS

CRITERION.—*Growth* upright ; *fruit* pale creamy yellow, almost transparent.

CATHERINA.—*Growth* drooping ; *fruit* bright orange yellow, of very good flavour.

DRILL.—*Growth* spreading ; a fine deep golden fruit, roundish oval ; *flavour* good.

GUNNER.—*Growth* free, erect, a great bearer ; *fruit* deep yellow to bronze, with paler veins ; one of the best flavoured ; *skin* thin. A.M. 1901.

COBHAM.—Resembles Gunner, to which A.M. was given.

HIGH SHERIFF.—*Growth* moderate ; a very good early gooseberry, hairy, rich orange yellow ; *flavour* first-class.

KEEPSAKE.—*Growth* vigorous ; *fruit* pale greenish yellow, lightly dotted with red. One of the earliest to pick green, a large handsome fruit, making top prices in the market ; *skin* thick.

BERRY'S KENT.—Very similar to, if not the same, as Keepsake.

LANGLEY BEAUTY (Veitch's).—*Growth* free ; *fruit* rich golden yellow ; one of the finest for beauty and flavour. F.C.C. 1896.

LEADER.—*Growth* moderate, upright, a great bearer ; *fruit* deep orange and brownish green ; of good flavour, very large.

LEVELLER.—*Growth* drooping and free, an enormous bearer ; *fruit* primrose with pale orange blotches and veins ; *flavour* rich ; *skin* thin ; early.

LORD RANCLIFFE.—*Growth* upright ; *fruit* handsome, pale yellow.

MARIGOLD.—*Growth* moderate ; *fruit* deep orange, paler near stalk ; very rich *flavour*.

RINGER.—*Growth* free and drooping ; a very fine large round gooseberry, yellow, netted, and shaded brown.

STELLA.—*Growth* upright and vigorous ; *fruit* oval shaped, light yellow.

Other good sorts are :—Broom Girl, Garibaldi, Gipsy Queen, Peru, Thatcher, Two to One.

GUAVA, THE (see p. 215).

LEMON, THE (see p. 205).

LOQUAT, THE (see p. 215).

MANGO, THE (see p. 210).

THE MEDLAR

This fruit is very highly esteemed for dessert when in proper condition ; it is also delicious when made into jelly, cheese, or as a sauce for game. The trees, budded on the whitethorn, are very hardy, and will grow anywhere. The branches require a fair amount of thinning, and a mulching of rich manure on the surface of the ground when the fruits are formed will repay the grower.



FRUITING BRANCHES OF THE MEDLAR.

Mention should also be made of the beauty of the medlar tree when in flower. There are but three recognised varieties :—

DUTCH OR MONSTROUS.—This has very large foliage and flowers, and produces the finest fruit. The tree has a weeping habit, and is not out of place on a lawn ; it may be made to form an arbour. The fruits are gathered in October and left in a cool fruit room until Christmas to ripen ; they are then much esteemed.

THE ROYAL.—The fruits of this are not so large as those of the Dutch ; the tree has smaller leaves, but as a rule bears better crops than the former.

NOTTINGHAM.—This has quite small, brisk, well-flavoured fruits, and they are very freely produced ; the tree is of upright growth, and both branches and foliage are thin.

MEDLAR, THE JAPANESE (see p. 215).

CHAPTER IX

THE MELON

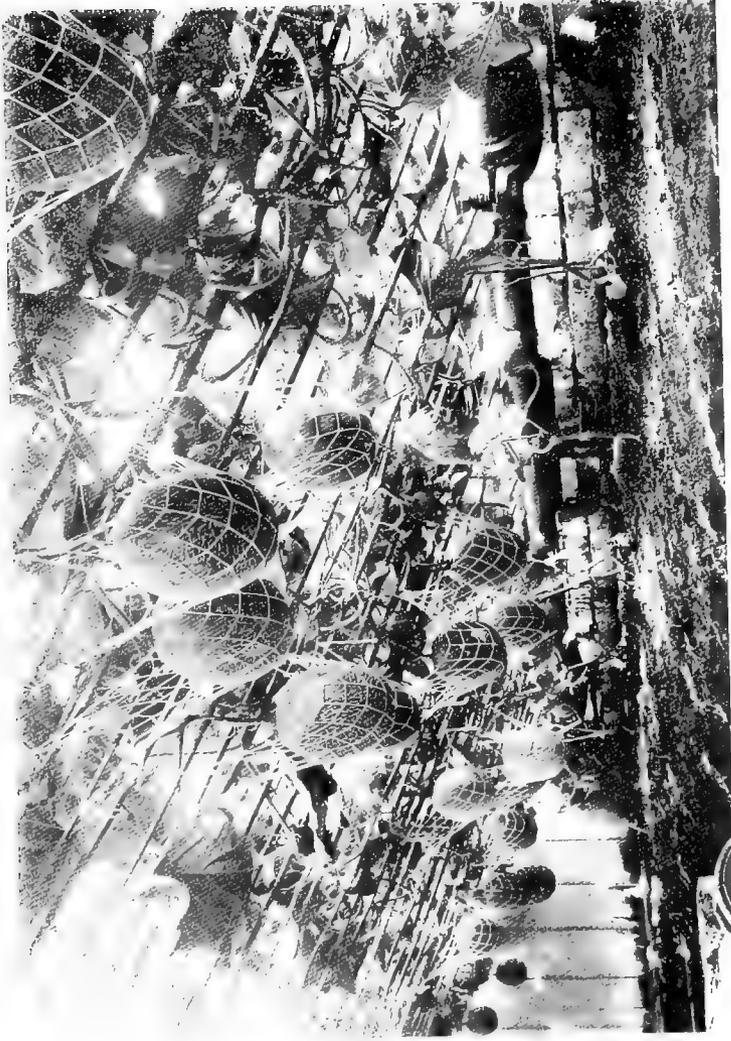
By OWEN THOMAS

THE natural order of plants (*Cucurbitaceæ*) to which the melon belongs embraces widely different kinds of fruits, and includes the cucumber, the gourd, and the vegetable marrow, but the melon is by far the most important, whether considered as an article of luxury in this country or as an article of food in the country where it is indigenous. The Cantaloupe melon, which takes its name from a town so called near Rome, is the variety most esteemed on the Continent. The flesh of the Cantaloupe is rather dry, inclined to hardness, and not melting or juicy, as compared to the melon grown in England under glass. It is imported in large quantities, and, as it is sold cheaply, affords to our industrial population wholesome and pleasant food. It may be grown in this country in summer in unheated glass frames, and then is of superior flavour to the imported fruits, but it can be obtained from our shops at so low a price that its culture in this country under artificial conditions will never be undertaken to any extent. The water melon is a fruit greatly appreciated in Egypt, China, and the East Indies, where it is cultivated extensively. In some parts of Upper Egypt whole districts are covered with water melons. The melon as known to English gardeners appears to be a native of Tartary, and, like several more of our exotic fruits, is supposed to have been introduced into Britain from Italy in the year A.D. 1520, and from Gerarde's account, its culture appears to have been almost restricted to the royal gardens. Gerarde had not grown this melon himself, but had seen it at the Queen's house, St. James's. It is stated in Gough's "British Topography" that melons were common in England as early as the time of Edward III., but were entirely lost, as well as the cucumber, during the Wars of the Roses. It is singular as confirming the fact that the evil of too many sorts of melons is a complaint of very long standing, that we find Miller remarking: "In this country there are too many melons produced of no value by those who supply the market, who, endeavouring to enlarge their size, render the fruit of no value, and unworthy of the trouble and expense, being more fit for the dunghill than the table." That the complaint has existed from that time until now in a more or less acute form must, I am afraid, be admitted, but let us hope that the mischief in this respect in the present day does not deserve the scathing condemnation pronounced by Miller against it in his time. There has been so much written, and well written too, of late years as regards the cultivation of the melon, that were it a question only of writing for the present generation of gardeners, I do



MELON CULTURE IN NARROW BORDERS.

Harold G. Green



AN EFFECTIVE METHOD OF SECURING MELON FRUITS.

not know that I should presume at this time to swell the volume of matter written on the subject. But most of us know that the wheel of time is something like the wheel of fortune; it is wonderful how quickly it revolves, and how soon one generation of gardeners is succeeded by another.

As grown in British gardens, the melon may not be so important as some other fruits, yet no summer dessert is considered complete without its refreshing and welcome presence. No committee of a horticultural summer show would think of issuing a schedule without offering prizes for this popular summer fruit, and certainly no gardener is deserving of the name who has not endeavoured to excel in its cultivation.

HOUSES.—Any structure that is sufficiently well heated will grow melons satisfactorily, but for very early crops lean-to houses, well heated, are the best, and these should face due south. For summer crops, no doubt, span-roofed houses are the best, and they should be built with the ends pointing south and north, so that the plants may have full advantage of the morning, afternoon, and evening sun, and not the full force of the sun at the hottest time of the day. I do not advocate large houses for melons—for one reason, because they succeed better in rather small ones, and for another, that they can be more economically grown, for of course less fuel is required to heat the latter than the former. A width of 8 feet is quite sufficient for a lean-to structure for early forcing; the length must be determined by the number of plants to be grown and the quantity of fruit required. The roof should be at an angle of about 38 degs. The height of the back wall need not be more than 9 feet, efficient top and front ventilation must be provided, and the ventilators should be so secure that when closed *no air* can enter, for it must be remembered that early melons are grown in winter, when scarcely any front air is admitted from the time they are planted until the ripening time approaches. If the ventilators, especially the front ones, are not effectually closed, there is much waste of heat and fuel. In houses of this size and description, three 4-inch flow and two return hot-water pipes will provide sufficient heat. As regards bottom heat, I prefer that furnished by leaves and stable (straw) litter mixed up in sufficient quantity to make a bed 2 feet thick when well trodden down. This will afford sufficient heat for three or four months, *i.e.* until the crop is ripe. If these materials are not available in sufficient quantities, then hot-water pipes will have to be substituted; one flow and return 4-inch pipe will be enough, and these should be laid in the middle of the bed, which need not be so deep as when fermenting material is used. The cultivator should have full control of the heat, and valves therefore must be fixed both to the flow and return pipes, and the same holds good with reference to the pipes for warming the atmosphere.

SIZE OF BED.—It was the custom years ago, and I am afraid it is now more or less, to provide large, wide, and deep beds to accommodate the materials thought necessary for the successful culture of the melon. This practice, I need scarcely say, entailed much waste and needless expense; the melon needs but little soil to grow in, as evidenced by the excellent crops often produced by plants in comparatively small pots. The size of bed I advise if fermenting

materials are used is $3\frac{1}{2}$ feet deep and 2 feet wide, these when settled to occupy rather more than 2 feet, and the soil rather less than 1 foot. If hot-water pipes are used, a bed 2 feet deep by 2 feet wide will be large enough. I ought to say that the border should be high enough to allow the young plants when planted out to be within 18 inches of the roof of the house, and within 6 or 7 inches of the trellis upon which the plants are to be trained.

SOIL.—The best compost for melon culture is turf cut from old pasture-land, and if the land is inclined to be marly, or of a strong, loamy texture, so much the better. The turf should be cut 4 inches deep (with the grass undisturbed). It is often recommended that with the loam should be mixed a certain quantity of organic manure (*e.g.* horse droppings, cow manure, and leaf-mould). This, in my opinion, is a mistake, as of all materials loam alone is the best. The object to keep in view is to build up a healthy, strong plant, free from gross and sappy growth—a plant that will not give way under the strain of perfecting a heavy crop of fruits. If the turf, or other soil available, is poor and of loose texture, then I should advise the addition of a small quantity of horse or cow manure and marl. Whole turves, as cut from the field, should be placed on the fermenting material the width of the bed, grass side downwards: make them firm by treading. On this turf small hillocks of soil should be placed 2 feet apart, composed of loam broken into small pieces about the size of a walnut, and made fairly firm. In the course of three or four days, when this soil has become warm, and the manure has lost some of its rankness, the young plants may be planted. If hot-water pipes are used for bottom heat instead of fermenting material, then in the bottom of the bed upon which rest the hot-water pipes, place broken bricks deeply enough to cover the pipes, finishing with a layer of broken crocks; upon this place the layer of turf forming the foundation of the bed of soil. The heat from the pipes will easily permeate the whole of the bed, and can be regulated by the valves.

RAISING THE SEEDLINGS.—If ripe fruits are required in early spring, the seeds should be sown not later than the 1st of January. I have occasionally sown them about the 20th December, and if the weather early in the new year happens to be bright, enabling the young plants to make a fair start, there is a slight advantage in this early sowing. About the 25th April is as early as it is possible to have melons ripe, and to enable the grower to cut fruit at this early season great care and vigilance must be exercised. The best way to raise the earliest seedlings I have found is to make up a heap of fermenting material (large enough to accommodate the number of plants required) to within 6 inches of the roof in a warm house. Two seeds should be placed in a small pot; one seed would be enough if it were sure to grow, but so early in the season seeds sometimes fail to start. The small pots must be plunged in the prepared bed, the temperature of which will be 85 degs. at first, falling to 80 degs. when the young plants appear above ground, and at this temperature it will remain for some time. When the seedlings are seen the temperature of the house should not be allowed to fall below 65 degs. Fahr., even in the early morning; in order to keep a temperature of 70 degs. Fahr. at night, which should be the minimum, it is better for the plants, and more economical also, to cover the

house with mats. The roof glass should often be washed, as light during winter is of importance to the young melon plants. As soon as it is possible to determine which of the two seedlings is the stronger, the weaker should be cut off without disturbing the roots, and the other encouraged to grow. When the young plant has formed, say two leaves in addition to the seed leaves, I have found it an advantage to transfer it to a larger pot, and to replunge in the hot bed; this, however, ought to be disturbed to half its depth, and a little fresh litter added in order to raise the bottom heat slightly. By the first or second week in February the seedlings should be sturdy, and ready for planting in the beds already prepared for them. Before planting out, examine the plantlets carefully to see if there is green fly on them; indeed, from the first moment the young seedlings appear, this persistent enemy must not be allowed to stay.

PLANTING, ETC.—Make a hole in the little mounds of soil, wide and deep enough to allow the tiny plant to be placed therein intact, and without disturbing the roots. After planting, the surface soil of the seedling plant should be a $\frac{1}{4}$ inch lower than that of the hillock. The soil around the plants must be made firm, and a small stick be placed against each for support, but far enough from the stem as not to injure it or the small roots near. A trial stick should be inserted in the mounds of soil to ascertain from time to time the temperature of the bed; and if found too warm a fork must be inserted in the soil beneath the plants, so as to raise them; when after a few days the heat has subsided, the plants may be pressed back into position. By keeping the plants free from fly and closing the house early in the afternoon, progress will be rapid, and the young plants will quickly reach the trellis. In securing the young growths, do not tie them too tightly. If very early fruits are desired, the plants must not be stopped; lateral shoots will naturally push out, and as soon as possible secure three with female flowers on, and fertilise these with pollen from the male blooms, preferably on a dry day.

For the information of the inexperienced, I may here draw special attention to the fact that in order to secure what is commonly understood as “a good set of fruit,” say, three fruits on a plant of the large growing varieties, and four of the small ones, the female blooms on a plant should be fertilised at the same time if possible, as if one or two fruits are allowed to develop before any more blooms are fertilised, the chances are that a light crop will result. By a little patient waiting, it is always possible to secure three or four flowers open together.

GENERAL CULTURE.—As soon as the roots have filled the small mound of soil more must occasionally be added until the fruits are formed, then the final addition of soil must be made in the form of a ridge all along the bed, and almost the width of the turves which form the foundation; press the soil firmly down. Attention must be given to tying in shoots and stopping laterals, the latter must not be stopped too short; for instance, the first lateral that makes its appearance from the main stem should be pinched at the fourth leaf whether a fruit has formed or not, and the sub-lateral which results should again be stopped at the third leaf, and so on as long as lateral growth con-

tinues. It is impossible to make a hard and fast rule in this matter, but the foregoing are safe rules to follow, the object being to provide sufficient new growths to keep the plants in health. At the same time overcrowding must be avoided, and when necessary the grower should not fail to cut out a useless, barren branch or superfluous laterals; endeavour to have a trellis covered with healthy foliage that will help the plants to develop and mature a crop of perfect fruits. As soon as the fruits have reached the size of a hen's egg they should be supported. The most useful article for this purpose is a small net which can be bought for the purpose at a trifling cost, or a piece of strong raffia placed crossways under the fruit and tied to the trellis answers very well.

So far we have been considering the first early crop of melons, which is never so heavy as later crops are; later plants therefore should be planted more than 2 feet apart, the distance recommended for early ones. If it is decided to grow the plants with single stems, as advised for the early crop, they should be planted $2\frac{1}{2}$ feet apart, and the main stems allowed to grow uninterrupted until they have reached the limit of the trellis. In the meanwhile many laterals will have formed, nearly all of which will produce a fruit; from them a selection of the best should be made in order to secure a full crop of three or four fruits to a plant. Many years ago a common method of melon-growing was that known as the "extension" system, *i.e.* planting one or two plants in a house, and allowing them to extend until the whole surface of the trellis was covered by their shoots alone. There is no doubt that excellent melons may be grown in this way, and it is also a fact that two, and sometimes three, crops may be obtained from the same plants in one season. The first crop is always good, but the second and third crops are not usually so. Where this system is adopted it is necessary to prune the plants rather severely after each crop has been gathered in order to make room for plenty of young growth to provide the next fruits. I have found better and more profitable results from the single stem system of cropping, and by this it is possible to secure three good crops from the same house in one season.

CANKER.—One of the greatest sources of trouble in the cultivation of the melon is the liability of the stem to collapse just as the fruits are about to ripen, often blasting with bitter disappointment all the labour and care of anxious months. The man who can point out a safe and perfect cure for this dreaded complaint would deserve well of his brother-gardeners; but as he has yet to be found, the best I can do is to suggest a few preventives and a partial remedy. It will be remembered that at first I recommended the plant to be grown without manures of any kind, the object being to produce a healthy and sound plant in preference to a soft and gross one. This, in my opinion, is the greatest safeguard against this disease. Another is not to cut the laterals too closely which form on the stem at its base (where canker always appears), but let them remain, and stop them at the fourth leaf. I think to cut away the laterals at the base of the stem often helps to produce this disease by reason of the wounds formed. When once canker is perceived (and the first indication is a slight black mark on the stem) the best thing to apply is Portland cement, putting it dry on the affected part. If the disease is not arrested by the

first, successive applications must be given until sometimes in extreme cases the stem will consist almost entirely of cement. This sets hard, and forms with what little life there is left in the stem a channel for sap circulation, saving a crop which, if not so perfect as otherwise would be the case, is better than the disappointment of an utter failure.

WATERING.—With increased light and heat and the extension of growth the melon plants must be liberally supplied with water, and always of the temperature of the house they are growing in. Allow the border to become fairly dry occasionally, and when watering does take place let it be an effectual one, and alternately while the fruits are swelling it should consist of manure water from the stable or cow yard. Liberal waterings must be given until the fruits are fully developed and are showing signs of ripeness, and during the ripening process water must not be entirely withheld, but only so much must be given (and clear tepid water only) as will keep the foliage fresh. The ripening fruits should be closely examined, and as soon as the aroma from them is distinguished and the stalks show signs of parting from the fruits, these should be cut. Take care that the stalks are preserved, as when they are broken off the appearance of the fruits is impaired.

TEMPERATURES AND VENTILATION.—As I have before mentioned in the case of the earliest crop of melons, little or no front ventilation will be necessary from the time the fruits are set until they are ripe; top ventilation is ample to regulate the temperature. For subsequent crops the treatment will be much the same, only more air will be necessary as the summer advances, but the melon plant should not be subjected to cool treatment at any time; the minimum should be 60 degs., maximum 85, or 90 degs. when closing the house in the afternoon. Melons do not require much air at any time.

SHADING.—Unless the roots or stems give way in consequence of an attack of canker, or from some other cause, shade should never be given.

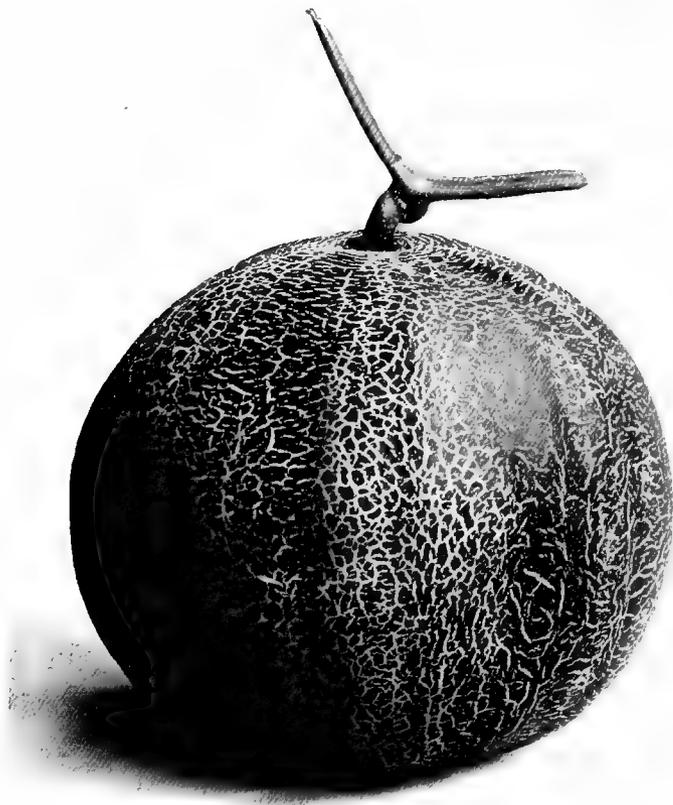
SUCCESSIONAL CROPS.—When only one house is available for the culture of the melon, it is quite possible to obtain three good crops in one season, as I have before mentioned, but to accomplish this it is necessary to anticipate the planting-time by having good-sized, strong plants ready as soon as one crop is cleared, and to secure the best results it is better to clear out all the old materials from the beds, and fill up again with fresh manure and soil. The old materials need not be wasted, for they will be valuable in other ways in the garden. Where new manure cannot be had in quantity, add some fresh to the old, and treat the soil similarly before the second crop is planted. The third crop of fruits should be ripe towards the middle or end of October. Melons can be had of fairly good quality even so late as the end of November. Where successional houses are available, I prefer planting out the young plants from small pots, when only two or three leaves are developed.

THE MELON AS A MARKET CROP.—In the Channel Islands, where the conditions are more favourable, melons are extensively grown for the English and other markets, and are, I believe, fairly remunerative; but they are only grown to a limited extent for market in this country, and then generally as a crop between others in the middle of summer, when scarcely any fire heat is

required to develop and mature the fruits. In this connection one of the most important considerations to bear in mind is to grow those only which are of handsome, golden appearance, well netted, and which are reliable and heavy croppers, and for this purpose I do not know of better varieties than Golden Perfection, Royal Sovereign, and Hero of Lockinge.

CULTURE IN COLD FRAMES.—Taking the country generally, I suppose where there are three gardens possessing ample accommodation for melon culture in houses, there are scores, if not hundreds, of small gardens, not so favourably placed, whose owners would be delighted to be able to grow their own melons. This is quite possible, and the method of doing so during the summer months is easy and simple. We will suppose that the would-be grower possesses a one, two, or three-light frame, as the case may be, and the size of the frame will govern the quantity of fermenting material necessary. If only a one-light frame is available, the bed should extend beyond the frame for at least 2 feet all round, all the better if for $2\frac{1}{2}$ or 3 feet. When the bed is finished it should be 5 feet high; the material, consisting of ordinary litter from the stableyard, mixed with fresh leaves, if obtainable (if not, stable litter will do by itself), should be put together temporarily in a large heap to ferment, and in the course of a week turned over to let the noxious gases escape; in about two hours it must be put together again until it becomes hot, then opened out as before, when, as a rule, it will be safe to make the permanent bed of the dimensions given. Immediately the bed is completed, the frame should be placed upon it, and the necessary soil put in; this will be the same as recommended for beds in the houses, namely, a layer of turf across the middle of the frame, 2 feet wide, laid grass side downwards, and a small mound of soil in the centre of each light. The seeds are sown, two in a small thumb-pot, and the pots plunged in leaf soil previously placed in a corner of the frame. It will be necessary for some time to leave a little air at the back of the frame night and day to allow the escape of any injurious fumes, which, in a confined atmosphere, might prove fatal to the young plants. When these have three or four leaves plant them out. They must be kept intact as they come out of the small pots; in planting press the soil firmly. A little air must be given each morning if the weather is sunny and warm (not otherwise), but close the frame in good time in the afternoon, so that the heat may rise to 80 or 85 degs. with sun heat. Before closing, the plants, border surface, and sides of the frame should be syringed with tepid water. Until, by experience, the grower knows how high the temperature will become after the frame is closed in the afternoon, a thermometer must be placed in a convenient corner; look at this a quarter of an hour after the frame is closed, and if more than 85 degs. are registered, a little air must be readmitted. After a few days' close observation the cultivator will soon know the proper time to close the frame in order to secure the heat desired, but until this experience is obtained, reference must be made to the thermometer.

GENERAL CULTURE.—The young plants will make rapid progress, and when about six inches high they must be stopped, so that each plant will



A TYPICAL NETTED MELON.

produce two stems instead of one, making four stems in the space under each light, and these should be disposed on the soil something in the way of a Maltese cross. When these growths are $2\frac{1}{2}$ feet long, again stop them; lateral shoots will then push out from the stem, and upon these the fruits will be produced. As soon as a good set of fruit is secured (by carefully fertilising the female blossoms with pollen from the male flowers), two fruits to a stem, that is, four fruits to a plant, a quantity of warm soil should be added as a top dressing. Half a barrow-load of soil to two plants will be sufficient, it should be firmly pressed down, and no further addition will be necessary. Keep lateral growths under control, by stopping and cutting out, as becomes necessary to prevent overcrowding. When the fruits are the size of swans' eggs, they should be raised from the surface of the border, and placed on inverted flower pots for better exposure to light and sunshine. With careful attention to ventilation, syringing, and closing the house early in the afternoon, the plants will make good progress, and soon reward the grower with an excellent crop of ripe fruit. Watering must not be neglected; use tepid water, with occasional waterings of diluted manure water from the stableyard, or guano water. On no account must water come into direct contact with the main stem of the plant at its base, certainly not nearer than two inches to it, otherwise there is great danger of the stem damping off, the plants collapsing, and the crop being sacrificed. It is not safe to commence melon culture in cold frames before the end of March, and as long as cold evenings and nights continue the frames must be covered with mats; at first three mats thick will be none too many, gradually reducing to one as warmer weather approaches.

INSECT ENEMIES.—Green and black fly are most troublesome, when the melon plants are young. They can then be destroyed by means of a small soft brush, and, when the plants are larger, by slight fumigation with "XL-ALL" Vaporizer. Red spider is sometimes troublesome. The best way to deal with this is on its first appearance to sponge the affected leaves with warm water in which soft soap and sulphur have been mixed, in the proportion of one wine-glassful of the former and two of the latter to a gallon of water. Frequent syringings with tepid rain water will afterwards keep this pest in check.

VARIETIES.—These are innumerable, and almost every grower has his favourites. There are three sorts of melons, namely, those with green, scarlet, or white flesh. The following may be relied upon for culture in a house, pit, or cold frame :—

GREEN-FLESH VARIETIES

ROYAL JUBILEE.—Large, handsome fruit of good flavour, and deep flesh.

WINDSOR CASTLE.—A large, oval-shaped fruit, finely netted, and of rich and delicious flavour.

HIGH CROSS HYBRID.—An excellent old green-fleshed variety.

EASTNOR CASTLE.—Still one of the best. Flesh dark green, of great depth, and delicious flavour. Densely netted.

GILBERT'S VICTORY OF BATH.—An old variety of sterling merit.

MIDDLESEX HERO.—A fruit of medium size, and of the highest quality and flavour.

DICKSON'S EXQUISITE.—This is well named, somewhat small, a free cropper, and certainly one of the best flavoured melons known.

EARL'S FAVOURITE.—A promising new variety of excellent flavour. Densely netted.

The green-flesh melon I consider to be richer and more luscious than either the scarlet or white-flesh varieties, but not so sweet and refreshing as the white, neither is the flesh so firm and satisfying as that of the scarlet varieties. In one respect, the green-flesh melon suffers from a serious disadvantage as compared with the white or scarlet, that is, in its much less attractive appearance; the skin is generally of a dull green colour, contrasting unfavourably with the golden appearance of the white-flesh varieties particularly. Most of these are also prettily netted.

WHITE-FLESH VARIETIES

FROGMORE ORANGE.—This is one of the earliest as it is one of the most handsome melons, a free cropper, and of delicious flavour.

HERO OF LOCKINGE.—Still one of the most popular and best. Skin bright yellow.

THE COUNTESS.—One of the best. Not unlike the preceding.

DAVENHAM EARLY.—As an early variety this is not so well known as it deserves to be. It is a small melon, of exquisite flavour, and matures quickly.

THE LADY.—This has a tinge of green and pink in the flesh, but still may be legitimately classed among the white-fleshed sorts. It is of the sweetest flavour. Of medium size, prolific, and will keep in good condition for a long time after it is ripe. Well netted.

BRITISH QUEEN.—This also has a faint tinge of green in the flesh. It is one of the best and most handsome. Rich primrose colour, well netted. F.C.C., R.H.S.

ROYAL SOVEREIGN.—A large, handsome melon, of delicious flavour, a heavy cropper, good for exhibition or for market purposes. Award of Merit R.H.S.

SCARLET-FLESH VARIETIES

BEAUTY OF SYON.—A variety of medium size, pleasing appearance, and excellent flavour.

BLLENHEIM ORANGE.—Still one of the very best in all respects.

FROGMORE SCARLET.—A handsome melon of oval shape, with very deep solid flesh, of rich flavour. Densely netted.

GUNTON SCARLET.—A new variety of promise.

SCARLET PREMIER.—A well-known general favourite. It is without doubt among the best.

READ'S SCARLET FLESH.—An old variety of medium size, and excellent in every way.

MONSTERA DELICIOSA (see p. 214).

THE MULBERRY

By GEORGE BUNYARD

This fruit is much appreciated, and, except in the northern parts of Britain, it can be grown upon standard trees in the open garden.

Mulberry trees can be purchased of good size, and in transplanting it is important to lay out the fleshy carrot-like roots their full length, not to cut or shorten them. In dry weather the mulberry tree suffers very much after removal, and a hay-band placed round the stem, and kept damp, is of great assistance for the first year after planting. After being pruned into form for one or two years, the trees naturally become shapely, developing handsome round branched heads.

The stems are often split or damaged by frost, and large holes appear, but these are soon covered up as the tree grows. In cold districts the mulberry can be grown upon south walls, trained flat, the side shoots pruned so as to form spurs, and also as a pot bush in the orchard house. Under favourable conditions the fruit becomes large, and is delicious. It is usual to plant the trees upon grass-land, and the grass not being too closely mown prevents the ripe fruits bruising as they fall. The mulberry ripens from August to October. The best variety is the black mulberry, the white mulberry is less hardy; the weeping Russian variety has small black fruits which ripen in July, and are of a pleasant flavour.

CHAPTER X

THE NUT

By GEORGE BUNYARD

COB NUTS and filberts require more pruning and cutting than any other fruit tree. When received from the nursery these trees have a small head upon a



PRUNED BRANCH OF COB NUT

- (a) Leader shortened to a wood bud with catkins produced from base; (b) side shoot or lateral closely spurred in; (c) side shoot shortened to a wood bud; (d) side shoot long pruned to secure catkins, the shoot having been broken down in summer to concentrate energies in lower buds; (e) one-year-old spur on two-year-old wood; (f) shoot that has been broken down in summer above pruning point, shortened to wood bud, with catkins at base; (g) shoots to be spur pruned; (h) blossom buds in flower; (i) wood buds.

stem 12 to 15 inches high. This stem is provided in order that the ground beneath the bush may be more readily tilled and kept free from weeds. They



COB NUT IN SUMMER.



COB NUT (NOT YET FULLY PRUNED) IN WINTER.

are planted as received, and after being allowed to grow for one year the shoots are pruned closely, to make them throw out vigorous shoots to form the foundation of the future tree. At the annual pruning, make the cut so that the terminal shoot is produced from a bud pointing outwards; in course of time a basin-shaped head of branches will result. The best shaped old trees I have seen started with six shoots cut back to form twelve main branches; from these, spurs or short shoots are given off, on which nuts are produced. If the trees are well managed, when 100 years old they will be 15 to 20 feet across the top, but not more than $5\frac{1}{2}$ feet from the ground. From the bent portion of the main boughs a number of strong annual shoots are produced, which in Kent are called wands. Some of these are taken out in summer for packing the autumn fruit; in winter the remaining ones are broken out, and either sold for flower sticks or basket-making, or reserved to pack the soft fruit of next season.

The male catkins of the cob and filbert nuts are freely produced as early as February on the upper parts of the boughs, and should be allowed to remain long enough to fertilise the tiny crimson female flowers, which are produced on the smaller boughs. When the weather is very warm and still, it is advisable to tap the branches with a stick to disperse the pollen.

At the winter pruning the spurs are thinned, and, if necessary, shortened. Old wood is removed, and the stronger growths cut back and thinned, leaving the tree regularly balanced on all sides, allowing the free admission of air and sun among the branches. The foliage is larger on pruned trees.

In July or August, if time permits, it greatly helps the tree to break off the stronger shoots on the upper boughs (a sharp twist with the finger and thumb being all that is required); this benefits the buds below the fracture and assists in ripening the wood. It is found better than cutting, as the broken surface allows the sap to exude, preventing the formation of a secondary growth, which would weaken the bush and be of no value. In summer gross central shoots should be cut away also. At the winter pruning the broken ends are severed with a sharp knife. A careful pruner will always proceed so that there is an abundance of fresh young wood in the trees; and when a twig shows signs of age he cuts so that a fresh one shall succeed it for next year's fruiting: worn-out twigs are thus never seen in old trees. Suckers from the roots should be hoed off or severed with a sharp spade, and if well rooted may be reserved to make future plants.

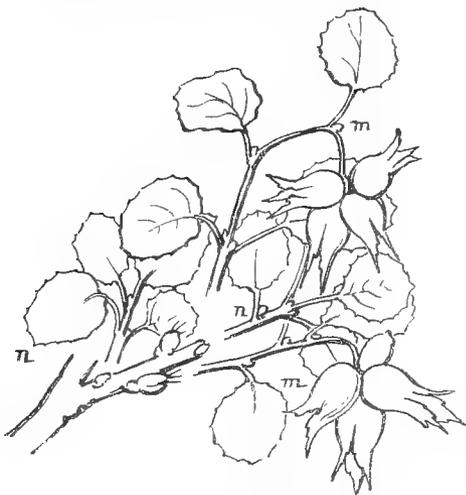


GROWTHS FROM A SHOOT CLOSELY
SPURRED IN WINTER

In following summer; (*j*) short shoot, or natural spur that need not be shortened in winter; (*k*) vigorous growth broken down in summer, and cut to above third bud from base in winter; (*l*) shoot from blossom bud bearing nuts, may be cut away in winter to cross line.

Kent is noted for its fine nuts, and only because in that county a vigorous system of pruning is carried out. Where the trees are allowed to grow

naturally and wildly the nuts are small, and the crop is almost worthless. They respond to a liberal treatment, and well repay for manuring occasionally as well as for the pruner's labour.



GROWTHS FROM SHOOT SHORTENED TO A WOOD BUD

(*m*) From blossom buds and bearing nuts; (*n*) short stubby shoots from wood buds which being mere short twigs need not be shortened at winter pruning.

DUKE OF EDINBURGH.—This is a short nut with a very thick shell, and usually produced in twos and threes; of excellent flavour. F.C.C.

KENTISH COB OR LAMBERT'S.—This is the best for general culture. The nuts are very large; the husk is wide, rather flat and deeply notched, and extends far beyond the nut. It is very hardy, and may be grown in all situations, even on gravelly and stony soils. Hundreds of tons are grown in Kent.

COSFORD COB.—A variety with roundish nuts with a very thin shell and borne in bunches of six; of excellent flavour, and a free cropper.

MERVEILLE DE BOLLWYLLER.—The largest variety; nut round with a thick shell; flavour excellent; usually two nuts in a bunch. A very sturdy grower.

WEBB'S PRIZE.—This is a variety of the Kentish Cob, and generally produces larger and more handsome bunches than the latter. Nut very similar; the husk is rather longer.

PEARSON'S PROLIFIC.—Very similar to Cosford Cob.

FILBERTS

THE WHITE OR KENTISH.—The nuts are of oval shape, small but very richly flavoured. It is tender in damp soils, and a shy bearer.

THE RED SKINNED.—A variety which is of very rich flavour, but a shy bearer. When fresh the skin is quite red, the foliage being brownish green.

PROLIFIC OR FRIZZLED.—This is a very handsome bunched variety, which often has twelve fruits in a bunch. It ripens before all the others, and is most prolific and quite distinct. F.C.C. 1901.

COB NUTS

BERGEM.—One of the best bearers. The bunches are very handsome and the nuts are large.

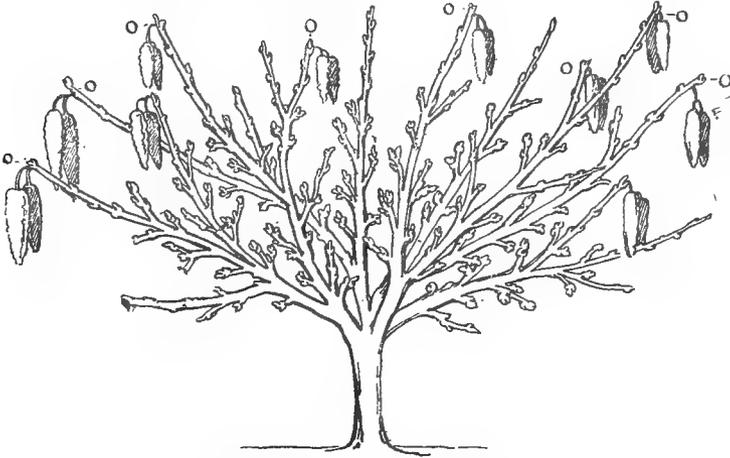
WALNUTS

Walnut trees of good size, which bear well in from eight to twelve years, are supplied from nurseries. The walnut will grow in all kinds of soil; where the climate is too cold to ripen the nuts, these can be picked in a green state and used for pickling. For this purpose the shell should not be hard; a good test is to try and pass a strong needle through them. On the Continent walnuts



AN OLD NUT WALK

are washed, and then put on a kiln with sulphur. This kills the germ, and thus they keep better than the English nuts.



COB-NUT TREE AFTER PRUNING, FOUR YEARS OLD

(o) Terminal growths bearing catkins; other growths are spurred in, though some may be left long pruned for filling vacant space, or furnishing the tree with branches.

The thin-shelled English variety is considered a good one, but as this is raised from seed it cannot always be depended upon.

The large French walnut succeeds in the warmer parts of England, but unless the summer is a warm one it does not ripen well, and the edible part is only half formed. The nut is very large.

ORANGE, THE (see p. 205).

CHAPTER XI

THE PEACH AND NECTARINE UNDER GLASS

By OWEN THOMAS

OF all British-grown fruits few, if any, are more esteemed than the peach and the nectarine.

HISTORY.—The peach boasts of a very ancient and interesting history. Although the country to which it is indigenous is not known for certain, it is generally believed to be a native of Persia. The peach tree is supposed not to have been cultivated in England before the year 1562, but by whom and whence it was first introduced we have no authentic record. Gerarde, in 1597, describes the white peach, the red peach, and the yellow peach, adding, "I have them all in my garden, with many other sorts." From this account, and finding it in the list of fruits published in the year 1557 by Thomas Tusser, who mentions peaches white and red, there can be little doubt that it was introduced into England as early as the reign of Henry VIII., and probably from Italy, by Wolf, the king's gardener, in the year 1524, as at this time we find he brought the apricot from that country. Whichever country may be the native home of the peach, and whoever may have had the honour of introducing it into England, are points involved in considerable mystery, and we pass from the historical part of our work to the more practical.

I propose to divide the subject of the cultivation of the peach into two parts: first, under glass (the trees planted out); and, second, on walls out-of-doors.

THE HOUSE.—The first thing to consider is the house in which the peach trees are to be grown, and the most favourable position in the garden which can be given to it. The size of the structure must be regulated by the supplies required. The house that I would recommend for forcing the earliest crops is a three-quarter span-roofed one. This form of house admits of nearly as much light as a span-roofed house does, and is more easily kept warm in winter by reason of the high back wall. It is important that the roof of the house should have a steep pitch, at about an angle of 45 degs. Flat-pitched roofs are to be avoided. Good peaches I know have been and are grown in flat-roofed houses, but certainly better crops and finer fruit can be grown with greater ease and certainty in steeply pitched ones. Two methods of fixing the trellis (upon which the trees are trained) are practised. One way is to fix the trellis at a uniform distance of 2 feet below the roof. By this method all the roof is utilised for the production of fruit, which is fully exposed to the sun and light all day. The other plan, favoured by many, is the drum trellis, reaching half-way up the roof. In this case the trees are planted against the back

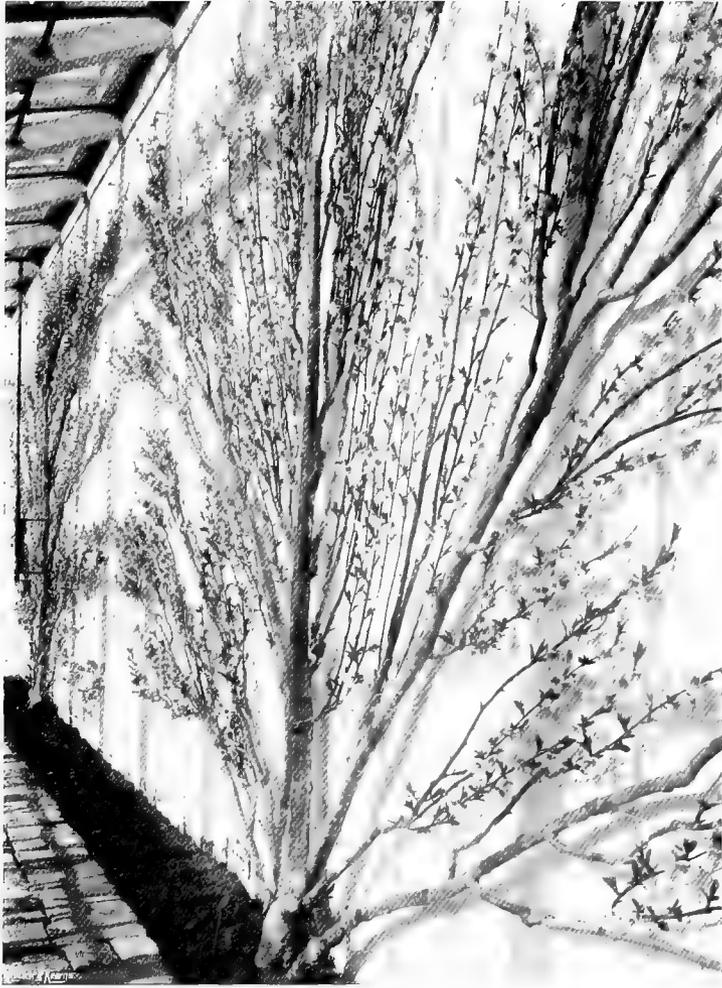
wall, and trained up as far as the apex of the hip-roof, and another set of trees, planted on the low-front trellis, are kept purposely low in order not to obstruct the light from those on the back wall. This enables the cultivator to obtain a crop of fruits from the back wall, which the former plan does not, and it also affords an opportunity of growing a greater number of varieties in the same house, as more trees are required to furnish it. A longer succession of fruit may be had from the same house by planting early, mid-season, and late varieties.

VENTILATION.—Of late years so much thought and attention have been devoted to the study of this question by enterprising horticultural builders, that a cultivator contemplating the building of glass-houses for fruit-growing purposes cannot do better than be guided by their experience and follow their advice. Still, there are considerations bearing on the subject which appeal more directly and with greater force to the cultivator than to the builder, and this is particularly the case with regard to winter and spring ventilation during forcing time. The first point I would notice is the fact that for months together in the winter and spring the ventilators are not required at all, for generally too much cold air finds its way into the houses beneath the panes, be the house ever so carefully glazed; and this leads me to remark of the loss and waste in fuel caused by badly fitted and warped ventilators. Another point worth noting is the fact that front air in winter and early spring is now scarcely ever admitted by good cultivators in early fruit forcing. Top ventilation in winter and spring, by which means alone the temperature should be regulated, becomes of paramount importance, and whenever possible, ventilators should be fixed which open at either side, so that the panels can always be opened on the side opposite to which the wind is blowing. In this way air can be admitted without at the same time causing violent cold draughts. Means, of course, must be provided for the admittance of plenty of air during summer. It is only as regards the cautious use of it in winter and early spring that I have felt called upon to give a word of warning, and this warning applies with equal force to other fruit trees as well as the peach. There is no rule without an exception, and I do not mean to say that advantage should not be taken of a warm, sunny morning, when the peach trees are in bloom, for instance, to admit a little front air for a short time, if it can be done without lowering the temperature too much. Span-roofed houses are much the best for producing peaches in summer and autumn. The ends should face north and south; the early lean-to houses, on the contrary, should face due south.

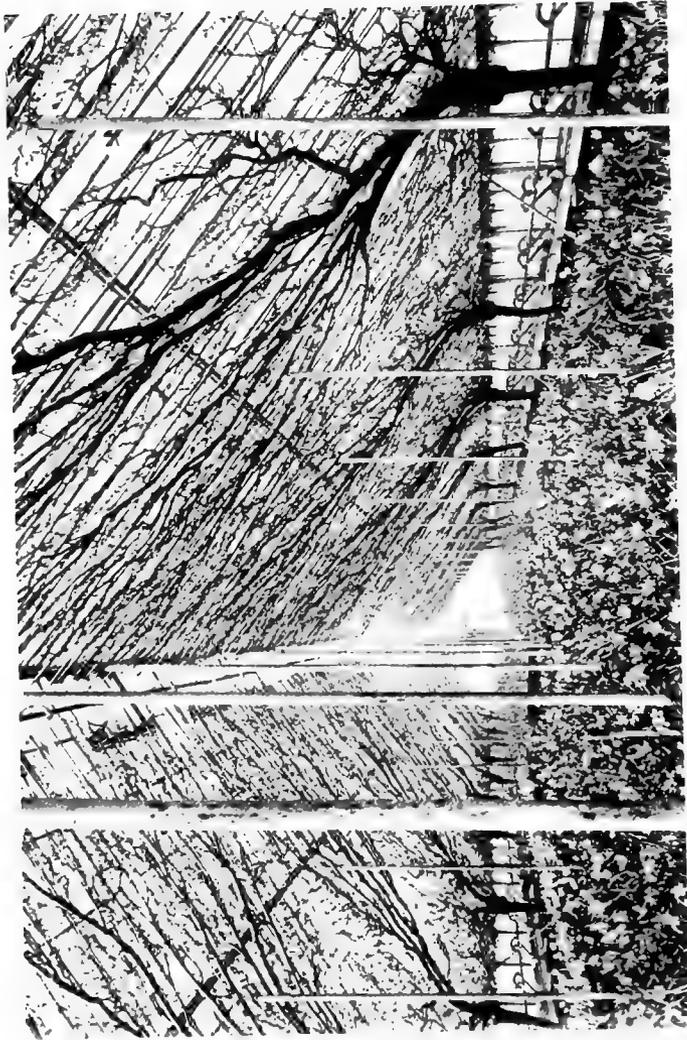
THE BORDER.—An important item in the successful cultivation of the peach is the construction of the border. To do this well begin by digging out all the soil inside the house to the depth of 2 feet 9 inches, and similarly treat the outside border; each border should be 9 feet wide, measuring from the front wall of the house. Any clayey soil, or that which is poor, must be removed, but any of good quality may be retained, and can be used again when mixed with new soil in the formation of the border. Assuming that the soil has been cleared away to the depth mentioned, the next question to consider is that of drainage; first, lay the main drain (if one does not

already exist) at the base of the border. It should empty itself at some convenient point of lower level. If the subsoil should prove to consist of stiff clay or marl, it will be necessary to concrete the bottom to prevent the roots from penetrating this undesirable medium. The border must then be 3 feet deep. If, on the contrary, the substratum should be of sandstone or chalk, no concrete is necessary; if it is found to consist of a good bed of gravel or sand no other drainage will be necessary, neither would the main drain spoken of be required. Artificial drainage, however, must be provided in most cases, and the best way to secure this (after the main drain has been laid down) is by laying 4-inch pipes at the bottom of the border, 4 feet apart, obliquely towards the lower end of the main drain, and emptying into it. The bottom of the border should be so formed, that there is a fall of at least 6 inches towards the main drain. The pipes should be covered with a layer of broken bricks, stones, or such rough material as is at hand, and will carry water away rapidly. I have no hesitation in condemning the making of large rich borders for the planting of young fruit trees of any kind. Under this system I know they will make remarkable growth for the first year or two, but this is at the sacrifice of permanent success. The border I recommend should be first made 5 feet wide—3 feet wide inside, and 2 feet outside; the front wall must be arched to allow of the roots spreading both inside and out. In commencing to form the border place turves grass-side downwards over the drainage, and build turf walls at the limits of the 5 feet wide border; they should be parallel to the wall of the house and $2\frac{1}{2}$ feet high.

THE SOIL.—The border should be formed of fairly heavy loam cut from old pasture land. This should be stacked long enough to destroy the grass roots, and no longer; a couple of months will suffice. When preparing the turf for the border it should be chopped into pieces about 5 inches square, and to each cartload of loam add a barrow-load of road scrapings, and the same quantity of old mortar rubble, broken bricks, and a bag of $\frac{1}{4}$ -inch bones. I may here draw attention to a matter which has an important bearing on the successful cultivation of the peach tree, and, indeed, I may say on all stone fruits, that is, the necessity of the soil in which they are grown having a liberal mixture of lime in its composition. This compost should be turned over several times, and when well mixed placed loosely in the border between the two turf walls. The soil must not be prepared when wet, nor should it be very dry; it must be moistened if necessary to make it friable. Presuming that the border is ready to receive the young trees, the next thing to do is to find out how many trees will be required to fill the space at command. We will suppose that it is decided to plant the house as recommended, namely, the back wall and front trellis, and as good trained trees can be had for a few shillings, I would advise that tall standard trees be planted against the back wall, say, at 10 feet apart, with dwarf fan-trained trees between them; a border should have been prepared for them in the manner advised for the front border. By planting the standard and dwarf trees together, the wall will be covered in two or three years with fruitful trees. Previous to planting, a wire trellis should be fixed to the back wall. The wires (not galvanised)



PEACH TREES ON BACK WALL OF GLASSHOUSE.



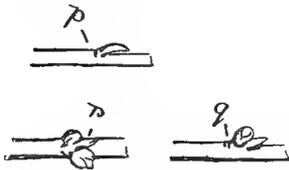
DAFFODILS AND PEACH TREES IN A MARKET NURSERY.

should be fixed horizontally, 9 inches apart, and fastened to iron pegs driven in the wall at a distance from it of 2 inches. The front trellis should be made of curved iron, should be fixed far enough from the front wall, so as to leave room for a narrow path, wide enough only to admit of the person in charge being able to attend to the trees in the way of tying, disbudding, syringing, and gathering the fruit, &c. The wires of the trellis should be the same distance apart, namely, 9 inches, and the trellis should be distant from the glass at the centre 3 feet or more according to the size of the house, so that ample light may be afforded the back wall trees. Where the one trellis system is adopted, then 2 feet from the glass will be the proper distance for the trellis to be fixed.

ROOT-PRUNING.—Do not order the trees until everything has been made quite ready for planting, for the young roots are liable to serious injury if left exposed for any length of time; and even if carefully placed in soil to wait some convenient time for planting, damage to some of the roots is sure to follow. The trees I would recommend are fan-trained and three years old. They should have five or six shoots of moderate size, and well ripened; those with gross and unripe growth are unsatisfactory. See also that the stem is free from knots and bruises. Before planting carefully examine the roots, and if any strong tap roots immediately below the stem are found, cut off to within 7 inches of their bases. The difference in the mode of carrying out this simple operation indicated will exercise a more or less controlling influence on the tree for years afterwards. For instance, if the cut is made straight across, or obliquely with the cut surface beneath, new roots which form may grow down into the subsoil, thus aggravating the trouble it is desired to avoid. An oblique upward cut will obviate this more or less, as the roots emanating from such a cut will be more likely to extend in a horizontal or upward direction, and, as a consequence, form useful surface roots, that all good cultivators aim to secure. Some growers advocate the practice of bending the tap root, without cutting at all, maintaining that by this method tap roots are altogether got rid of, and that surface roots form from the tap roots when so treated. Roots of secondary strength should be served in the same way as advised for the tap roots, but leaving them about 15 inches long. From these cut roots a number of new fibrous roots will arise. If strong roots are not restricted and made to produce quantities of fibrous and useful roots, they will soon ruin the best-formed tree by producing strong, succulent, and barren branches; branches, moreover, which will be subject to gumming and canker, two dreaded maladies. Besides the tap and secondary roots which have been considered, there should be a number of small healthy fibrous ones. These must not be interfered with further than to cut out any which are damaged.

PLANTING.—In filling up the narrow borders between the turf walls I advised that the soil should be placed rather loosely and heaped up, so that at planting time when pressed down it would fill the border to within about 2 inches of the surface of the turf wall. Presuming that the soil is neither very wet nor very dry, it should be trodden down firmly, and the trees

planted from 9 to 10 feet apart according to the size of the house. The act of planting in itself is a simple one. At the same time, there are certain details to be observed in carrying out the work which, if neglected, will adversely influence the future welfare of the tree. The soil in which the tree is to be planted must be taken out to the depth of 7 inches, and to the extent of about 2 feet square, or large enough for the roots to be extended their full length. A small mound should be formed in the centre of the position in which the tree is to be planted, to enable the planter to press the base of the stem and roots well into the soil, and through the same pressure incline the ends of the roots upwards. Place the tree in the hole prepared for it; its branches should be fastened to the lower side of the trellis so that the trees may be trained below and not above this. It will be found that the roots are more or less in layers, therefore the bottom layer must be first carefully covered with the soil, working it among the roots with the hands, and making it firm as the



CHARACTERISTIC WOOD BUDS

(*p*) Single wood bud; (*q*) double bud—a wood bud with blossom bud at its side; (*r*) triple bud—a wood bud and two blossom buds—wood bud (in centre) long, thin, and pointed—blossom buds short, bold, and rounded.

work proceeds. After the first layer of roots is disposed of, the next should be taken in hand and treated similarly. It is advisable to place a small ridge of turf around the stem about 18 inches from it, so that when watering takes place one may be sure it reaches the roots instead of filtering away into the soil of the border where there are no roots. Give each tree a good watering a day or two after planting, and here I should like to impress on the cultivator to be most careful only to water the trees where the roots are known to be, that is, inside the small ridge of soil placed around the stem. The soil in the remaining part of the border where there are no roots must not receive any water until new roots are formed in

spring, and even then sparingly until summer, when copious waterings may be given as the soil becomes dry. The young trees may be temporarily tied down to the trellis, but the final tying should not take place until early spring, just before growth commences. We will presume that planting has been completed about the end of October, which, in the case of all stone fruit trees, I consider to be the best season of the year to carry out this work, either for trees under glass or out-of-doors. At the same time, fruit trees may be planted with safety between September and the end of February, or even into March, but the best results are obtained from October and early November planting.

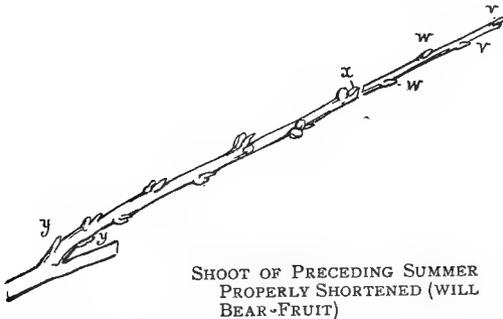
PRUNING.—Towards the middle of November the grower must decide whether the trees are to be pruned or not—that is, if the young shoots are to be cut back or left their full length. Many good cultivators will say that the shoots must not be cut, arguing that the wood buds will break from point to base of every shoot, thereby furnishing for next year's crop many more fruit-bearing shoots than can be expected from growths cut back to half their length, as I am about to recommend they should be. Were it a question of which system of pruning would secure to the grower the better result as regards the

yield of fruit for the first year or two, I should decidedly favour the shoots being left unpruned ; but when one considers that this is the time to form the foundation of the tree, and that its future success for, say, thirty years or more depends upon the method of early pruning, the importance of the subject is apparent. In the culture of the peach tree much difficulty is experienced in keeping the basal and lower branches well furnished with fruit-bearing shoots. This is occasioned in nine cases out of ten, in my opinion, by not cutting back the shoots of the young trees at the time of planting. I would recommend that each young shoot be cut back, certainly half its length. This will cause growth from buds near the stem, thus securing for future years an ample supply of fruiting shoots at the base of the tree.

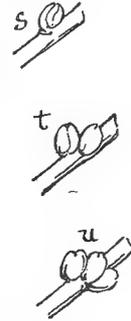
Here, for a moment, let me introduce the subject of insect pests. As soon as the buds burst into growth, in nine cases out of ten there also will be found green fly developing at the same time. Let me urge cultivators to be vigilant in their search for the enemy, for, if once it is allowed to invade the shoots in force, irretrievable damage will be done in an incredibly short time. The best way to circumvent its ravages is to anticipate its visits. Therefore I would recommend that the shoots be well washed with a solution of Gishurst compound, rather weaker than recommended on the printed instructions, while growth is dormant in winter. This will, as a rule, destroy the embryo fly ; if any are found upon the young growths, the best way to remove them is by syringing with a weak solution of tobacco water. If effectually got

rid of at this stage, it is probable that the trees will be more or less free from fly throughout the season.

DISBUDDING. — Shoots will develop rapidly on the young cut-back branches, and as soon as they are half an inch long dis-budding must be commenced. The cultivator must clearly understand which of the young shoots are to be left to bear crops of fruit the following year. The basal shoot must be preserved, so must also the terminal shoot on the same branch. Leave also, at first, three other shoots, about equal distances apart between the



(v) Extremity single wood buds ; (w) extremity single blossom buds ; (x) pruning to double bud, one a wood bud, and the other a blossom bud ; there must be a wood growth on a level with or beyond the fruit to draw the sap ; (y) basal buds from which a successional shoot must be secured.



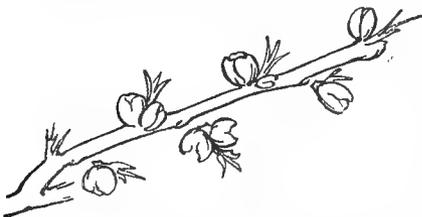
CHARACTERISTIC BLOSSOM BUDS

(s) Single ; (t) double ; (u) triple—all producing blossom, not any wood growth, therefore improper as pruning buds.

apical and basal ones ; all must be on the upper side of the branch. After an interval of ten days two more of the intervening shoots may be taken away,

leaving only one midway between the top and bottom shoots; if several are left they crowd the tree with useless growth. Among the wood-buds will be found a few flower-buds; an effort should be made to fertilise the flowers when they are open, by distributing the pollen when dry with a camel-hair brush or a rabbit's tail. The young tree may be allowed to bear a few fruits the first year after planting, for the reason that this prevents coarse growth.

GENERAL TREATMENT.—When the tree-roots are active, and have extended beyond the limited space advised to be ridged in for watering, they will soon take hold of the whole border, which should have a good soaking of water. Throughout the year the space inside the ridge should receive two waterings to every one given to the other part of the border, as in the first season, most of the roots will be there. I do not advise the use of manure water at all the first year. Speaking of watering, I may mention here what an important part this plays throughout the year in the successful cultivation of all fruits, whether under glass or out-of-doors, and especially so during the summer and autumn months; and this remark, I think, is peculiarly applicable to the peach. Let a peach tree bearing a good crop of fruit once become thoroughly dry at the root, and all prospects of success for the season are over. Therefore let me urge my readers never to let the soil about the roots of their peach trees become at all dry, and especially within 3 or 4 feet of the stem, where most of the fibrous roots are. It must not be supposed, however, that I recommend the border to be always wet. As some guide to the inexperienced, I may say



FRUITING SHOOT WITH BUDS REMOVED FROM UNDERNEATH

Often desirable when blossom buds are very numerous, in order to secure a stronger bloom and better set of fruit.

that all healthy peach trees, growing freely and bearing good crops of fruit, will need watering for a distance of 3 or 4 feet round the stem at least once a week; once in ten days or a fortnight will be often enough to water the whole border. When the trees are growing freely they must be syringed morning and afternoon, closing the house in the afternoon while the sun retains sufficient power to make the temperature rise to 75 or 80 degs. for a short time. All lateral shoots must be stopped when they have formed four or five leaves, and the young branches encouraged to make good progress, for upon them will depend next year's crop of fruit. When growth is finished and the fruits (if any) are gathered, the trees must have plenty of air night and day. Syringe occasionally, and as light and sun heat decrease give water less frequently.

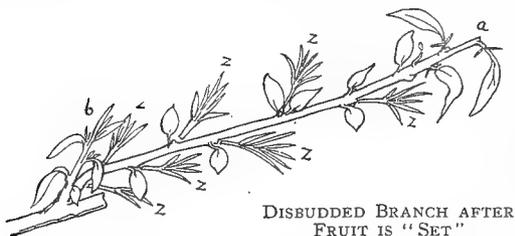
SECOND YEAR'S TREATMENT.—Instead of the five or six branches possessed by the young peach tree when planted, it should have, twelve months after planting, fifteen or eighteen, and if these are of moderate size and well ripened, no pruning will be necessary, simply wash with Gishurst compound before tying them to the trellis. If the summer treatment of the trees as regards disbudding and stopping the laterals was carefully attended to as directed,

practically no winter pruning will be necessary. It may happen that one or two strong roots have grown from other gross roots cut back the previous year, producing correspondingly strong branches. In such a case the best thing to do is to lift the young tree and cut the offending roots as before advised. Some may be surprised at my recommending the young trees to be lifted and replanted so unceremoniously. It is, however, a simple operation requiring not more than half-an-hour to carry out, and is most essential if the coarse roots are to be effectually dealt with. Many good gardeners lift and replant their peach trees every year, this method in some soils being the best to secure satisfactory crops. There will be little to do at the borders during this, the second winter season. Simply remove a little of the surface soil, adding rather more of fresh soil than you take away of old. After the trees have commenced to grow the same routine of treatment must be observed throughout as advised for the first year. If a "set" has been secured (and this should be the case if care has been taken to fertilise the flowers), I should certainly allow each tree to carry at least a dozen fruits. If the tree is in good health these will ripen perfectly, and at the same time will do good to the former. Even to young trees bearing heavy crops of fruit it is astonishing how beneficial is a top dressing of fresh horse manure mixed with an equal quantity of soil.

ENLARGING THE BORDER.—The routine of management in the third year of the tree's life will be very much like that of the second year, excepting that the border, inside and outside the house, must be enlarged by the addition of 2 feet of soil. In adding new soil break down the old turf walls, and remove the soil until the roots are reached. At the end of the third year it will probably be found that there are too many trees in the house, and the question must arise as to the best course to pursue. If all the trees are retained it will become simply a matter of hard pruning, for further extension is out of the question. For trees planted out in a good border, to my mind there is not a question of doubt as to whether the restriction or the extension system is preferable. By all means let the trees have room to grow. Where a certain number of varieties must be grown in a limited space there is nothing for it but to have recourse to frequent lifting or root-pruning, thereby restricting the annual growth of the tree without appreciably diminishing its fruit-producing capacity. On the other hand, where fruit of the first quality and in abundance is required, this fact should be considered at planting time, and the tree planted in the centre of the front trellis, as well as that planted in the centre of the back wall, be looked upon as the permanent occupants of the house. The other trees must be lifted and planted somewhere else, or it is not difficult to find a market for them.

RENOVATING OLD TREES.—It not infrequently happens that old-established trees under glass fall into bad health. It will not be irrelevant, therefore, to offer one or two practical suggestions as to the best way of bringing these into a healthy and fruitful condition. In nearly every instance that has come under my notice the trouble has been at the roots: the border was saturated or it had been allowed to become dry, the soil was poor or needed lime—conditions altogether inimical to the formation of fibrous roots. The best thing is to

remove the soil of the border to within at least 3 or 4 feet of the tree stem. In doing this many roots will be found, and must be carefully preserved. After the old soil has been cleared away and the drainage made perfect, the border may be partly re-filled with new soil, mixed as at first recommended. Among the useful fibrous roots there will be found many long, bare, and useless ones. These must be cut back half their length that young roots may spring from them. The new border formed should extend only about 2 feet beyond the

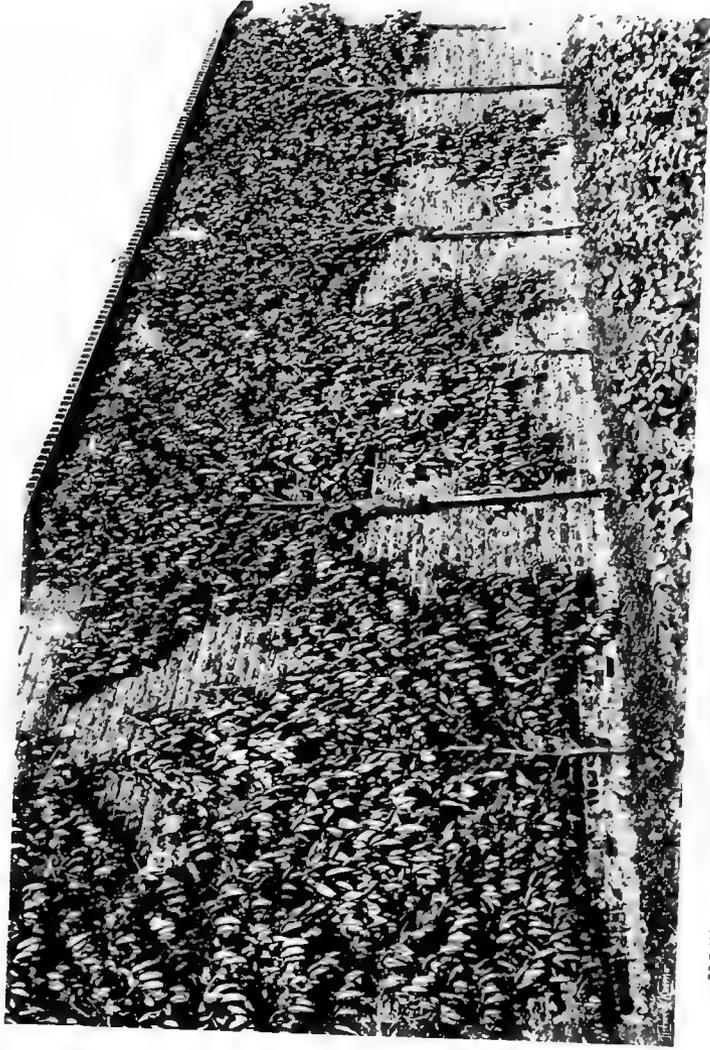


(a) Disbudded shoots; (a) growth to attract the sap to the fruit, stopped; (b) successional bearing shoot to take place in following year of that now fruiting.

roots. This will provide sufficient new soil for at least one year. Fresh soil can be added afterwards as required. A good mulching of horse manure and loam should be given to the tree or trees thus treated as soon as growth is active, and if the work has been carefully executed no great sacrifice of the crop will result. Either before or after a severe root operation of this sort has been performed it is advisable to prune the branches

rather severely, cutting out altogether any long, partly barren shoots, and shortening others which are likely to break freely, thereby helping to furnish the tree again with fruitful and more compact branches. A tree thus treated must be frequently syringed as soon as growth commences, and for some weeks afterwards.

VARIOUS METHODS OF TRAINING.—Of the various systems of training and pruning the peach tree under glass which are occasionally practised, I have so far only mentioned two, viz., with the curved front trellis and trellis on the back wall, and with one trellis covering the whole of the roof from base to summit. Another method of training the peach is upon a double upright trellis arranged transversely in the house. I believe that the claim advanced in favour of it is based principally on the theory that fruits are obtained from a larger surface. This cannot well be disputed, but it is open to question whether this larger area of fruit-bearing surface is not obtained at the sacrifice of some of the essentials of successful fruit culture, more especially heat and sunlight directly upon the foliage and fruits. This method has been known for a long time, and in these utilitarian days the public is not slow to take advantage of a good thing. Seeing that it has only been adopted on a very limited scale, we may, I think, reasonably conclude that it has failed to enlist the practical sympathy of growers. Another system which finds some favour is to train the trees horizontally, as usually practised with the pear tree on walls. When this system is adopted spur-pruning is generally resorted to, but the current year's shoots can also be tied in to bear fruit the following season. I have tried this method of culture for some years, but cannot recommend it. In narrow glass-houses, where the peach trees are planted against the wall only, I have had much success by training branches from the trees on the wall over the pathway and down the



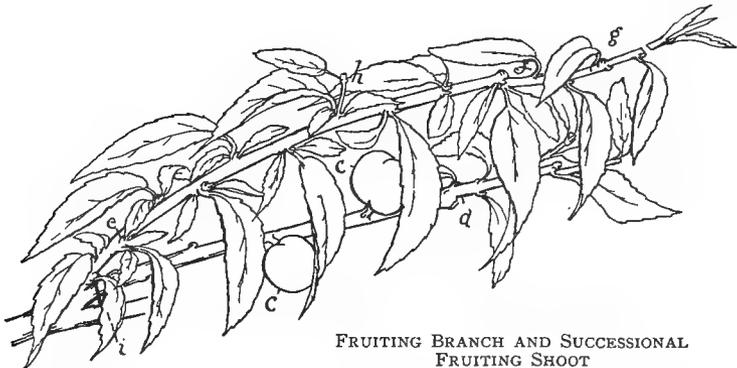
*HOW TO COVER A W-ALL QUICKLY. DWARF AND STANDARD FAN-TRAINING
PEACH TREES.*



MODEL FAN-TRAINED PEACH TREE.

front of the house, at distances of 12 feet apart. Cordon trees are thus practically formed, and they invariably produce a good crop of excellent fruit, without in any way impairing the fruit-bearing capacity of the trees on the back wall.

GENERAL REMARKS.—When trees are carrying heavy crops of fruit, weak manure water may be given at each watering, but as soon as the fruit commences to ripen manure water must be withheld, and less copious supplies given, although the trees must not at any time be allowed to suffer from dryness at the roots; use water the same temperature as that of the house. It will have been observed that I have not advised organic manure to be added to the peach border. The first consideration in making a border for fruit trees should



- (c) Fruits "stoned," two being ample to leave on a branch to secure good size and quality; (d) shoot above the fruit, pinched first to three or four leaves, and afterwards to one or two leaves; (e) successional fruiting shoot; (f) point of stopping successional fruiting shoot when about 14 inches long; (g) lateral and sub-lateral resulting; (h) lateral on the successional fruiting shoot, stopped always to one leaf or node, and in winter cut close to basal buds; (i) point of cutting out bearing branch after fruit is gathered.

be what materials will best encourage the formation of fibrous roots; and to my mind there is nothing so suitable as good loam, with the addition of ingredients previously recommended to make it porous. If the border is well filled with roots, liquid manure water may be given while the fruits are developing. I have found diluted farmyard manure water the best stimulant, but it is well to vary the manure by substituting at one time weak guano water, at another time soot-water; once or twice during summer the trees benefit greatly by sprinkling the border with nitrate of soda. In applying stimulants the grower should give them weak rather than strong; much damage has often been done by using too much manure. When the fruit is gathered the trees will be more or less exhausted, and a watering with liquid manure will do much good.

THINNING THE FRUIT.—Usually far more fruits are produced upon the trees than should be allowed to ripen. As a rule one fruit to each of the previous year's

growths will provide an excellent crop. On some of the stronger shoots two may be allowed. There will then be about one fruit to each square foot of branch surface; with this number well grown and perfected every reasonable cultivator will be well satisfied. Good colour is a great desideratum in the peach, and to obtain this the fruit should be well exposed to the sunlight; not too soon, however, as I believe the young fruit develops better under the partial shade of foliage. As soon as the stoning period of the fruits is over and



LATERAL FROM AN EXTENSION BRANCH

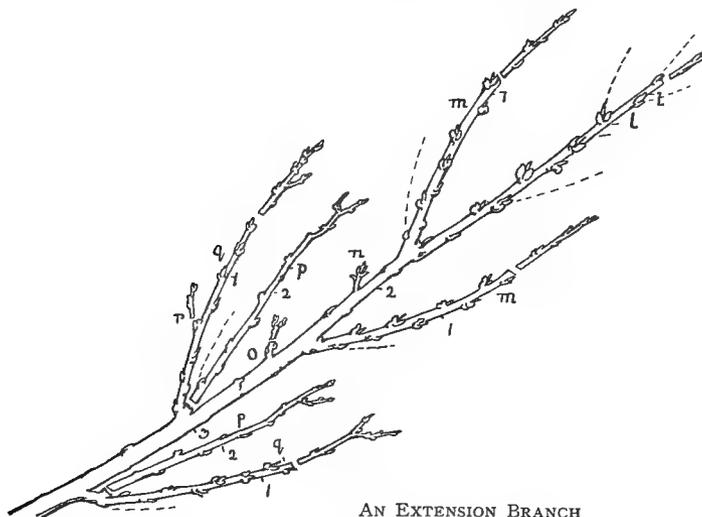
(j) Point of pinching; (k) point of winter pruning.

the latter are growing fast, they should be fully exposed to the light. The best way to accomplish this is to place stiff twigs of wood across the trellis from wire to wire beneath the branch, and so bring the fruit above the trellis, afterwards pushing aside any leaves which may overhang the fruit. When thinning the fruits, those below the branches should be removed and those on the upper side left; the latter can be more easily exposed to the light. The stoning period of the peach commences when the fruit is about the size of a walnut, and will continue for about a fortnight or three weeks, during which time the temperature must be slightly lowered and more air admitted. To ascertain when stoning is

completed cut a fruit, and if the stone is so hard that a knife will make no impression, then it is safe to conclude that stoning is over, and the usual conditions may again be provided.

TREATMENT OF RIPE FRUITS.—To the experienced cultivator, gathering, harvesting, and disposing of the fruit will cause no anxiety, but to the inexperienced a word of caution and advice is necessary. For a week or so before the fruit is quite ripe, if the weather is very hot, place a net (single thickness) upon the roof to prevent the fruit being burned and disfigured by the sun. A net should also be suspended under the tree to receive any ripe fruits which may not have been noticed when gathering. Many do not know when to pluck a ripe peach from the tree. Knowledge of this description can only be acquired by experience, and instruction in the matter is difficult to convey. The general appearance of the fruit will indicate approaching ripeness, but the final test must be that of the touch. The last portion of a peach to ripen is that around the stalk, and to this part must be applied the real test of ripeness. Should the flesh yield easily to the touch then the fruit is ripe; if, on the other hand, it does not, gathering must be deferred. Handle a ripe peach very lightly as the least unnecessary pressure will disfigure it, taking away many points from its quality either as an exhibition or dessert fruit. Never expose the ripening fruits to a chance of chill by unduly lowering the temperature of the house, or place them when gathered in too low a temperature.

PACKING THE FRUIT.—It is almost superfluous to remark that when peaches have to be sent a long distance by road or rail they must be carefully packed. How best to accomplish this work I will endeavour to show by detailing the method practised successfully by me for a great number of years; this plan was subjected to a test which was as severe as one could wish, namely, the journey from Windsor to Balmoral, about six hundred miles, yet I have no

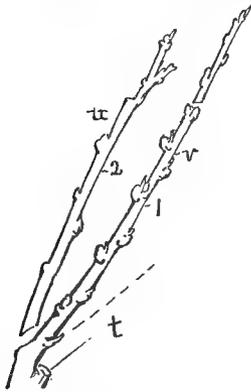


AN EXTENSION BRANCH

- (1) Extension shoot or continuation of branch, just the unripe point being shortened or cut off at winter pruning, as it is very important to retain only well-matured, short-jointed wood; the dotted lines indicate continuation growth furnishing side shoots in following summer; (*m*) side shoots from preceding year's extension branch, properly shortened to 8 or not more than 12 inches; (*n*) natural spur on previous year's extension branch; (*o*) pinched spur cut back; (*p*) bearing branch cut away after fruit gathered; (*q*) successional bearing shoot properly shortened; (*r*) point of cutting off a lateral. The numerals refer to the age of the branch; it will be noticed that the fruit is produced on the wood of the preceding year's growth, older wood being retained only to provide next year's bearing shoots and extension, the fruiting wood is renewed annually. Spurs, or short stubby shoots, are not advisable in the case of wall or trellis trees, though a few may be retained on the extensions for bearing once, then cutting away. On bush, pyramid, and standard trees, a larger number of spurs may be allowed.

recollection of receiving a complaint of the fruit having arrived in a damaged condition. When the grower knows that he has to send ripe peaches a long way by rail he must give careful consideration to the varieties he grows, as some travel much better than others. For instance, the early American varieties, such as Alexander and Waterloo, and some others introduced of late years, have skins so thin and easily bruised that it is absolutely impossible to send them any distance without their suffering damage. Again, peaches having to travel should be gathered before they are quite ripe, say

at least a day earlier than if they were intended for consumption at home, and if for a long journey two days earlier. The boxes I prefer for packing peaches in are those 16 inches square, divided into sections 4 inches square by thin boards as deep as the box, viz., 5 inches; each of these sections will accommodate one peach. The same boxes also answer well for packing the choicest varieties of pears, and for nectarines, apricots, and choice dessert plums, when two or three of the smaller fruits can be placed in one section. Before packing begins as many sections of the boxes as are likely to be wanted are partially filled with soft wood wool, enough to provide a base for the fruit to rest upon. In packing, the fruit, if possible, should be graded, first quality in one box, second and third in others, and each one labelled to this effect. This prevents much confusion and rough usage of the boxes at the destination. There is nothing better than common cotton wool for wrapping

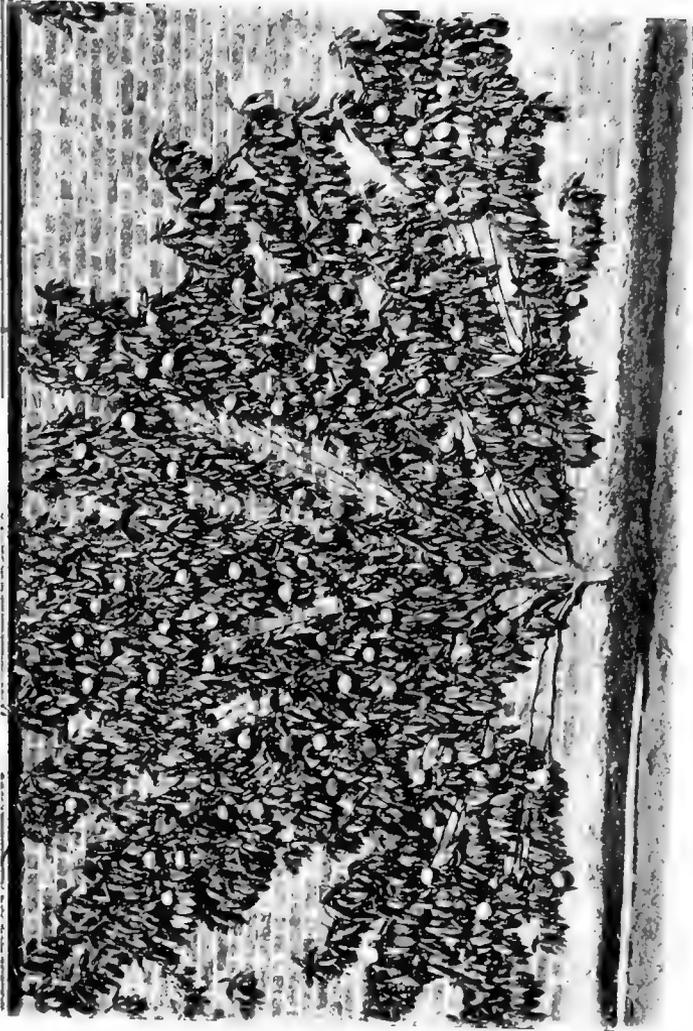


THREE-YEAR-OLD SIDE
BRANCH

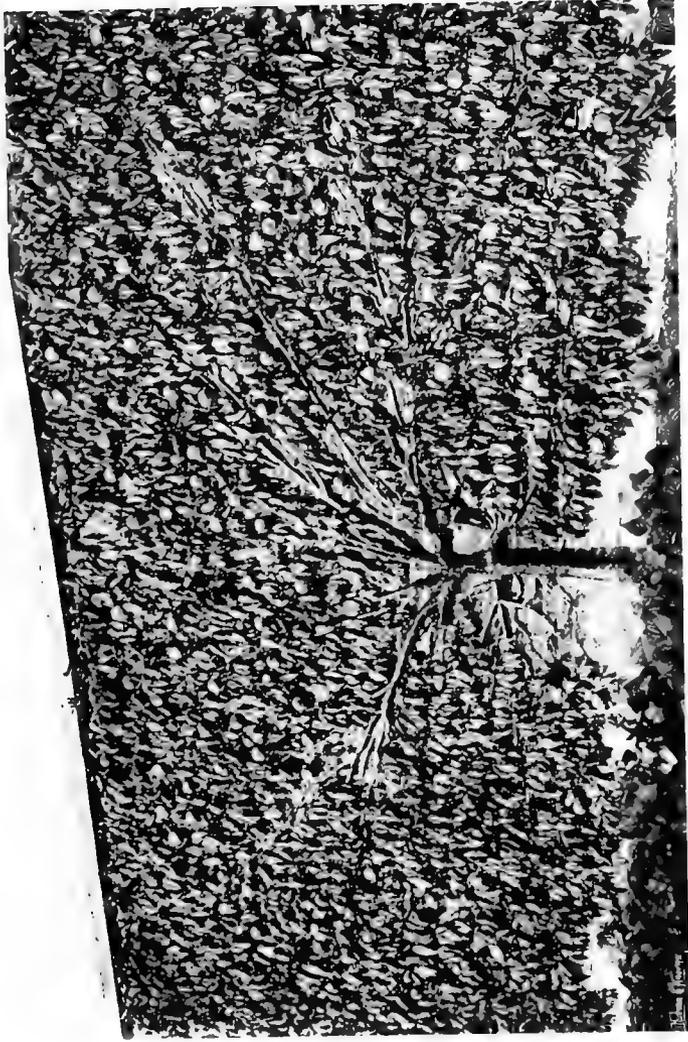
(1) Point where bearing branch was cut away after fruit gathered; (2) branch that bore fruit last summer, and cut away when fruit gathered; (v) successional bearing shoot. Numbers give age of wood.

around the fruit, the smooth side of the wool being placed next the latter. The wool should be cut into squares large enough to envelop the fruit; half the thickness of the sheet of wool is sufficient to protect it from injury, unless it happens to be very ripe, in which case the wool should be used as it is. The peach or nectarine should next be wrapped neatly in tissue paper and placed in the box. When the box is full, all space around the fruits must be carefully filled with more wood wool; place sufficient also upon the top, that when the lid is put on the box, slight pressure will have to be used in nailing it down, thus making the packing so firm that oscillation or displacement of the contents cannot possibly take place. A word of caution may here be given against using too many nails in fastening down the box. This only causes useless labour and shaking of the fruit in unpacking. A strong case (the ends fastened with iron bands) large enough to hold three of the boxes of packed fruit is provided. When well secured in this case it is practically impossible for them to suffer even with the rough usage they invariably, and, I am afraid, unavoidably, are subjected to at the hands of railway employés. Here I may say a word about returning

empties. Non-attention to this work is the cause of endless trouble and expense. True, it is in a degree out of the power and jurisdiction of the gardener to control this, but he may do much by impressing on those in authority the importance of not only returning the packages with despatch, but also the packing material, which can be used over and over again.



PEACH ROYAL GEORGE ON A SOUTH WALL.



STANDARD FAN-TRAINED PEACH TREE ON SOUTH WALL.

CULTURE ON WALLS OUT-OF-DOORS

Whether the climate in a certain district is favourable or not to the culture of the peach out-of-doors will, as a rule, be well known to those interested, and I need only say that, if the climate is favourable, let the other adverse conditions, such as bad soil and inefficient drainage, be what they may, they can be overcome in the way recommended for the culture of the peach under glass. I think it may be safely affirmed that the culture of the peach out-of-doors is less understood and its importance less appreciated by the present than by the past generation of gardeners. In all the counties around London the peach and nectarine will succeed admirably, as they will also in many places on the south, east, and west coasts where protection from strong winds can be given. In many of our inland counties, *e.g.* Worcester, Hereford, Berks, Surrey, Middlesex, Bucks, and some of the midland counties, they thrive well, and in many parts of Wales also may be most successfully grown. With regard to trees against open walls, there is no occasion to go to such expense in preparing the border for outside trees as recommended for trees under glass. Provided the border is sufficiently drained and the natural soil is fairly good, it will be necessary only to trench $2\frac{1}{2}$ feet deep, adding a barrowful of loam where the young trees are to be planted, and a good dressing of farmyard manure to the border generally, bearing in mind that heavy crops of vegetables or salads are grown there all the year round.

The aspect of the wall upon which the peach is grown should be south, although the earlier and mid-season varieties will succeed on a wall facing west or south-west, and trees in such positions will often prove useful in extending the season of these ripe fruits. The distance between the trees when planted should be regulated somewhat by the height of the wall; for instance, if against a 12-foot wall, dwarf fan-trained trees, three years old, should be 12 feet apart with tall standard trees between in order to fill the wall quickly; if the wall is only 9 feet high then 15 feet between each will do.

NAILING, &c.—It will be appropriate here to mention how the trees must be permanently fastened to the wall. The old-fashioned way, and which I still believe to be the best for many reasons, is nailing the shoots to the wall with cloth shreds. The more modern way is to fix against the wall a wire trellis to which the trees may be tied. Another method favoured by some is the use of wall nails with pliable lead heads which can be wrapped over the branch to secure it in the position desired without the use of shreds. There is no doubt much to be said in favour of each method. The system of trellising the wall secures neatness, and possibly despatch by saving time in training the trees in winter. Where this system is adopted the wires should be $\frac{1}{2}$ -inch in thickness and 10 inches apart, and when fixed should be distant from the wall at least $1\frac{1}{2}$ inches. The wires should not be galvanised, for this has been proved in many instances to be inimical to the bark of the young shoots. The objection I have to this system after considerable ex-

perience is that the trees do not derive full benefit from the heat communicated to the wall by the sun; the space between the foliage of the trees and the wall allows a cold current of air to pass through, thus effectually annulling any heat the wall may give, and neutralising the wall's usefulness. The objection I have to the wall nail with the lead heads is this, if the lead is pressed hard enough against the young branches of the trees at the winter pruning and training to hold them securely in position, then gumming will be caused before the end of the season by the lead cutting into the shoots. If the lead is not pressed hard enough against the wood in winter, friction and damage to bark will occur through oscillation of the branches. The old way, and the one I recommend, namely, nailing with list shreds (not cloth), certainly secures to the trees the full advantage of what heat the wall may absorb, and this is one of the first objects in planting against a wall. Another important item relating to the successful cultivation of the peach and nectarine out-of-doors is the protection of the bloom from frost in spring. Many different opinions are held on this question; some advocate no protection at all. Most of the peach walls at the Royal Gardens, Windsor, are protected by portable glass copings, fastened to permanent brackets fixed to the wall. To the copings and brackets are fastened roller blinds, which are let down at night and rolled up during the day so long as danger from frost is feared, they effectually protect the blossoms from any ordinarily severe frost. When this danger is over the glass protection and the blinds are taken down. The former are used to protect salad, strawberries, French beans, early peas, &c., and hasten maturity. The canvas blinds are well dried and carefully stored away ready for use another spring. Another simple and satisfactory method, and the one most commonly practised, is to hang herring nets, two or three folds thick, loosely against the wall. At the Royal Gardens, as I said before, most of the peach walls were protected by glass copings and blinds, but there were also peach walls which received no protection at all, so that I had excellent means of comparing the results from well-protected walls and those not protected. I am afraid that the statement I am about to make will be received with a smile of incredulity by many. It is, taking an average of five years, that as good crops were produced by trees on unprotected walls as on those well protected. This does not prove much in favour of protection, but it says a very great deal, I think, in encouragement of the more general culture of these delicious fruits, as they may be successfully grown without expensive protective material, or, in fact, any protection at all.

GENERAL CULTURAL REMARKS.—So important as regards the health and fruitfulness of the trees is the danger from the attacks of green and black fly at the time of flowering and immediately afterwards that I must be excused for drawing attention to it again. As a means of affording immunity from their early attacks I would recommend that the trees be washed when dormant in January with a weak solution of Gishurst compound before being fastened to the wall. Disbudding must have timely attention, and overcrowding the shoots strictly guarded against. When the young shoots in the course of the summer are fully grown, lateral growths will form; these should all be cut out.

Many cultivators fasten these shoots to the wall too early, more perhaps for the sake of neatness than with any other object, but it is a practice inimical to success, and which I would deprecate. Rather let the shoots, when reduced to a suitable number and the laterals removed, be left untouched, for I am convinced that the young peach fruits up to a certain stage enjoy the partial shade of the loosely disposed branches, and in consequence become larger and better. However, as soon as the fruits attain their full size and indications of ripening are apparent, then these shoots must be fastened in. The simplest and best way to do this is to press the young shoots to the wall with hazel or birch twigs about 6 or 7 inches long, fastening each end of the twig under the older branches. This secures the shoots in position for the remainder of the season. When doing this work, place the fruit in the best position as regards exposure to the sun; herein, in my opinion, the nailing-to-the-wall system possesses advantages which certainly cannot be claimed for the trellis, in so far that the fruits actually nestle against the wall, and thereby fully enjoy the sun heat. The method of fastening the young branches requires neither nailing nor tying, and is done in half the time that tying to a trellis would entail. A difficulty is invariably experienced as regards the out-of-door peach on walls in ripening the whole of the individual fruit at the same time: the side exposed to the sun ripens earlier than that next the wall. There is no way that I know of entirely overcoming this difficulty, but it may be considerably minimised by exposing all parts of the fruit to the sun's influence as much as possible, and by giving partial shade in very hot weather to the ripest portion. I have found that if the fruits are placed in the fruit-room after harvesting they ripen properly in three or four days.

Fruit trees on walls are at a disadvantage as regards the quantity of rain which finds its way to their roots in the course of the year when compared with trees growing in the open ground. For instance, those planted against a south wall get very little of the rain which may fall when the wind is in the north, and not very much when the wind is east and west. Therefore the deficiency should be made good by artificial means. To make this effectual I would advise that a ridge of soil be placed in front of the trees about 2 feet from the wall so that a thorough saturation takes place. When the fruits are developing, weak manure water may with advantage be given every ten days or a fortnight.

WINTER CULTURE.—After the fruits are gathered and the leaves have fallen, little remains to be done to the peach trees until pruning and nailing time arrives early in the new year. As early in the autumn as a convenient opportunity can be found, the border for about 2 feet from the wall should be lightly forked over, the loose soil removed, and in its place some rich and well-decomposed manure laid, about 3 inches deep; cover this again with soil, and finally give a good soaking of water. The winter rains will carry the manurial properties to the roots, recuperating the trees, and preparing them to bear heavy crops of fruit the following year. I ought to say a word on the winter pruning and training of the trees, although, as regards the former, if the summer treatment has been practised as advised for the peach under glass, there

will be little to do. Whatever the system of training, the principle to be observed is the same, namely, first to place in position and secure the main branches, forming, as it were, the foundation or framework of the tree. We will suppose the tree to be fan-shaped. The first thing will be to bring the two lowest branches to within a foot of the ground horizontally, and then to place the other main branches obliquely at equal distances apart. The space between the main branches will afterwards be filled in by minor branches and young fruit-bearing shoots of the previous year's growth.

SPUR-PRUNING.—The peach is quite amenable to spur-pruning, as much so as the pear or the plum, but it is seldom practised in its entirety, though useful in conjunction with the more usual method. It often happens that there are positions upon the main stems where it is inconvenient to have a shoot its full length, yet desirable to have fruit, and it is here that spur-pruning is useful. All we have to do is to cut the shoot back to three buds instead of tying it down, and the foundation of the spur will be permanently laid.

BUSH AND STANDARD TREES IN THE OPEN

During the exceptionally hot seasons of 1899, 1900, and 1901, excellent crops of well-ripened, good quality peaches and nectarines have been gathered from young trees in the open in nurseries within thirty miles of London. I have seen young trees of Pineapple Nectarine loaded with beautiful and delicious fruits, and the same with Waterloo and other peaches. The subject is an interesting one, and opens out a question of importance to fruit growers, which, so far as I know, has never been seriously tried—whether by the selection of varieties and suitable positions it is possible to make the culture of these fruits in the open a profitable one. The experiment is well worth trying on a limited scale. The fruits I have seen were excellent in quality and of good size.

VARIETIES.—The following varieties are best suited for culture on walls and under glass. Those most suitable for small collections have an asterisk placed against them :—

PEACHES FOR CULTURE UNDER GLASS

VERY EARLY.—*Alexander, Waterloo, Early Beatrice, Early Louise.* One tree of each of the above varieties is quite enough to plant in a small collection, as earliness is their chief recommendation.

EARLY.—**Duchess of York, Amsden June, Early Ascot, Grosse Mignonne, Dymond, Condor.*

MID-SEASON.—*Crimson Galande, Royal George, Stirling Castle, Bellegarde, Violette Hâtive, Noblesse, Goshawk, Raymaekers.*

LATE.—*Barrington, Princess of Wales, Gladstone, Nectarine Peach, Sea Eagle, Walburton Admirable, The Salway.*

PEACHES FOR WALLS OUT-OF-DOORS

EARLY.—**Alexander, Waterloo, Early Beatrice, Early Louise, *Early Rivers, *Duchess of York, Rivers' Early York, *Amsden June, *Early Ascot, Grosse Mignonne, Condor, Hale's Early, Abec.*

THE PEACH AND NECTARINE

111

MID-SEASON.—*Crimson Galande*, **Royal George*, **Stirling Castle*, *Bellegarde*, **Noblesse*, *Goshawk*, **Raymaekers*, *Dymond*, *Dr. Hogg*.

LATE—*Barrington*, *Prince of Wales*, **Princess of Wales*, **Gladstone*, *Nectarine Peach*, **Sea Eagle*, **Walburton Admirable*, *The Salway*.

NECTARINES FOR CULTURE UNDER GLASS

EARLY.—*Cardinal*, *Précoce de Croncels*, *Early Rivers*, *Lord Napier*, *Rivers' Early Orange*, *Stanwick Elruge*.

MID-SEASON.—*Pineapple*, *Violette Hâtive*, *Downton*, *Hardwicke Seedling*, *Spenser*, *Elruge*.

LATEST.—*Dryden*, *Byron*, *Humboldt*, *Victoria*.

NECTARINES FOR WALLS OUT-OF-DOORS

Précoce de Croncels, **Early Rivers*, **Lord Napier*, *Rivers' Early Orange*, **Violette Hâtive*, **Elruge* and *Stanwick Elruge*, *Downton*, **Hardwicke Seedling*, **Spenser*, *Dryden*, *Byron*, **Humboldt*, *Victoria*.

These Nectarines are placed in the order of ripening.

PEACH AND NECTARINE CULTURE UNDER GLASS FOR MARKET

This has now become an important and successful industry, many acres of glass-houses being devoted to the culture of these popular fruits to meet the growing demands of the London and other markets. To be successful it is an industry which should be conducted on a fairly large scale, and to this end span-roofed houses of large dimensions should be erected. Those 180 feet long by 24 feet wide answer the purpose admirably. It is not necessary to refer here to matters of cultivation or packing, as these subjects elsewhere receive full attention; the principles of good culture are the same whether the fruits are for commercial or private use. The following varieties are found to be the most reliable and profitable to grow for market. They are arranged in the order of ripening:—

PEACHES.—Very Early: *Amsden June*, *Duchess of York*, *Alexander*, *Condor*, *Abec*. Early: *Dr. Hogg*, *Crimson Galande*, *Royal George*, *Dymond*, *Goshawk*, *Large Early Mignonne*. Late: *Late Devonian*, *Princess of Wales*, *Prince of Wales*, *Exquisite*, *Barrington*, *Sea Eagle*, *Gladstone*.

NECTARINES.—Very Early: *Cardinal*, *Early Rivers*, *Rivers' Early Orange*, *Elruge*. Early: *Lord Napier*, *Stanwick Elruge*, *Elruge*. Late: *Pineapple*, *Spenser*, *Victoria*.

THE BEST PEACHES

BY GEORGE BUNYARD

Peaches and nectarines are most difficult to name. It is necessary to know if the blossoms are large or small, if the leaves have kidney-shaped or round glands at their bases, or whether the glands are wanting.

ALEXANDER.—*Fruit* small, flat with deep suture on one side; *flesh* whitish; *skin* deep blood red with yellow on shaded portion; *stone* very small. One of the earliest

to ripen. Juicy and refreshing, but not so richly flavoured as the later sorts. *Leaf glands* round; *flowers* large, pale rose, with darker eye. F.C.C. 1883.

ALEXANDRA NOBLESSE.—This is perhaps the sweetest and most delicious peach grown. *Fruits* from indoors are pale primrose colour, and the *skin* is very thin. *Flowers* do not "set" freely. It is a good grower. Some fruits may have a soft pale red skin; *flesh* primrose colour, veined red next the stone; *leaf glands* small, round; *flowers* large, palest blush.

AMSDEN JUNE.—This differs from Waterloo only in foliage; the flowers, however, have the merit of setting more freely when forced. The *fruit* is sweeter than Waterloo, flat, and mottled deep red in places. *Leaf glands* round; *flowers* large, bright pale rose, with dark eye; *skin* downy. A.M. 1892.

BARRINGTON.—*Fruit* large; *suture* small; *skin* rough; *colour* very pale yellow, mottled with red and deep crimson; *flesh* juicy, white, slightly red near the stone; *flavour* vinous, rich, and melting. A very fine hardy, rather late fruit. *Leaf glands* round; *flowers* large; *growth* vigorous and hardy. Excellent in all forms.

BELLEGARDE.—*Suture* regular, slightly depressed; *skin* dark primrose with rosy red cheek (mottled with deeper red under orchard-house culture), on open walls fully exposed it becomes black red, downy, peeling freely; *flesh* juicy, pale primrose, melting, more or less red near the stone; *flavour* delicious, very rich, certainly one of the finest grown; free stone; the *stone* is sharply pointed at the stalk end. We give rather a longer description of this grand peach than of others, because it is altogether first-rate. It must not be confounded with Violet Hâtive, English Galande, or English Bellegarde. *Growth* vigorous, cropping freely; *foliage* bold; *leaf glands* very small, round; *flowers* small, dull flesh-colour.

CONDOR.—*Fruit* downy; *suture* wide, with edges rounded; *skin* deep blood red, primrose on shaded side, speckled with red; free stone; *flesh* milk white, whiter round the stone, which is small, firm; *flavour* rich and almond-like, bitter when fruit is not fully ripe. A very hardy free-bearing variety, for mid-season culture. *Leaf glands* kidney-shaped to round; *flowers* large.

CRIMSON GALANDE.—*Suture* all round the fruit; *colour* greenish yellow shaded and mottled with deep crimson, shading to blackish crimson; *flesh* greenish yellow, bright carmine near the stone, which is small; mealy when fully ripe; *flavour* brisk; *skin* thick, peeling readily, downy. A very large variety which is valuable for main crop. Bears very freely, and is largely cultivated for the markets. *Leaf glands* round; *flowers* small, salmon red; *foliage* bold.

DUCHESS OF CORNWALL.—*Suture* shallow and broad; *skin* primrose on shaded side, striped and blotched with red; *stone* small, free; *flesh* juicy, melting, with a smack of nectarine flavour. This is expected to be an improvement on the early American sorts. Forces well. *Leaf glands* kidney-shaped; *flowers* very large, rose-coloured, and "set" freely. A.M. 1901.

DUCHESS OF YORK.—This fine late peach raised by Mr. Divers at Ketton Hall is not yet in commerce, but we believe it will prove a valuable and hardy variety of the Late Admirable race. *Leaf glands* none. A.M. 1893.

DYMOND.—*Suture* marked on one side; *skin* greenish yellow, covered with rich bright yellow on sunny side, soft and downy; *flesh* melting, greenish white, bright carmine red near the very small stone; free stone; *flavour* brisk and nectarine-like. A very fine large variety. *Leaf glands* none; *flowers* pale rose, very large; *foliage* very bold.

EARLY ALFRED.—Resembles Early York, and ripens at the same season. Has a rich, brisk flavour, and is very juicy. The tree is robust, short-jointed and very hardy, and bears freely. *Leaf glands* none; *flowers* large.

EARLY GROSSE MIGNONNE.—*Skin* downy, pale red on sunny side dotted with crimson; *flesh* deep red near the stone, with red veins running towards the skin; *flavour* rich and vinous, particularly agreeable. A most exquisite peach following the second early varieties; *foliage* flaccid, long and drooping; *leaf glands* very small, round; *flowers* large, rose.

GOLDEN EAGLE.—A very late yellow-fleshed variety; *fruits* very downy, flat, dull

golden, with coppery coloured cheek. It is large and clearer in colour under glass; *foliage* very large, with a golden tinge. Although an October peach it ripens perfectly. *Leaf glands* kidney-shaped; *flowers* small, salmon red.

GOSHAWK.—A very fine mid-season variety of vigorous growth. It attains a large size, and is one of the most handsome for outside culture, and extra fine under glass. *Skin* greenish white, mottled with spots on a dull red ground; *flavour* very brisk; *flesh* juicy and melting; the *fruit* closely resembles Dymond, but is a little later; *leaf glands* none; *foliage* bold, wrinkled; *flowers* large, rich rose with dark eye.

GROSSE MIGNONNE.—*Skin* very thin and downy; *colour* pale primrose, with a bright rosy cheek mottled with silvery spots, and sometimes with a dark crimson flush; *flesh* juicy, entirely pale primrose; *stone* small; *flavour* very brisk, rich; free stone; *leaf glands* round and small; *flowers* large.

HALE'S EARLY.—*Fruit* rather long and pointed, terminating in a prominent nipple; *suture* deep and narrow; *skin* downy; *colour* bright red, with blood-red blotches; *flesh* juicy, palest yellow, faintly red near the stone, separating from it freely; *flavour* brisk, rich, and quite first-rate; *leaf glands* round; *flowers* large, bright rose; *growth* moderate.

LADY PALMERSTON.—*Fruit* very large, rather flat. *Skin* woolly, of a bright golden colour, sometimes marbled with crimson. A noble fruit for a late crop under glass; except in good seasons it does not ripen well outside; free stone; *flavour* pleasant and good for its season; *leaf glands* large, kidney-shaped; *flowers* small, dull flesh colour; *foliage* very large and handsome.

LATE DEVONIAN.—*Suture* very deep and narrow; *skin* woolly rather than downy; *colour* pale primrose green, with bright red marblings and deep crimson blotches on the exposed side; *flesh* juicy, pale red at the stone; free stone; *flavour* brisk, rich, and melting; a fine, late, very hardy sort, and a free bearer; *leaf glands* round; *flowers* large, rich pink. F.C.C. 1894.

NECTARINE PEACH.—A good late variety. *Skin* very woolly, greenish white, with marblings of bright red and deep crimson, greenish on shady side; *flesh* juicy, white and translucent, deep red next the stone, from which it separates readily; *flavour* brisk; *leaf glands* kidney-shaped and quite small; *flowers* large.

NOBLESSE.—*Skin* downy, pale lemon yellow, sometimes a little shaded with red; *flesh* very juicy and melting, palest primrose, slightly reddened at the stone; *flavour* sweet, rich. One of the best-flavoured peaches. The tree grows well, but it does not bear very freely. *Leaf glands* none; *flowers* large and pale blush.

PRINCE OF WALES.—*Suture* marked; *skin* pale green, striped and mottled with red, when grown outdoors rich dark crimson. A very fine rather late peach, which fruits freely and is useful for outdoor and pot culture. *Fruit* pointed, large, and of nectarine flavour, juicy, and very rich; *leaf glands* round, *flowers* large, dull salmon red.

PRINCESS OF WALES.—*Suture* deep and narrow on one side of the fruit only; *skin* velvety; *colour* pale lemon and green, blotched with pale rose and spotted with red; *flesh* juicy, very white, and quite deep red near the stone; *flavour* very brisk, and refreshing, with a pleasant acidity. The skin separates readily, the stone leaves the fruit easily (free stone), and is very small for the size of the fruit. A grand late fruit. *Leaf glands* round; *flowers* very large, pale rose.

RIVERS' EARLY YORK.—*Suture* wide, on one side only; *skin* deep greenish yellow covered with pale carmine on sunny side, downy; free stone; *flesh* whitish, faintly red near the stone, which is large; *flavour* brisk and vinous. A very fine second-early fruit, bearing freely. Tree hardy. *Leaf glands* kidney to round; *flowers* large, very bright rose, dark eye. This is better than the old Early York, which has no leaf glands. F.C.C. 1867.

ROYAL GEORGE.—An old and justly esteemed variety. It is grand under glass; when well thinned the fruits grow to a large size. *Skin* thin, very deep blood red with pale yellow on shaded side; *flesh* palest yellow, nearly white, very bright red near the stone; *growth* vigorous. Bears freely, forces readily, and seldom fails. *Leaf glands* none; *flowers* small, dull salmon red; *foliage* wrinkled, bold.

SEA EAGLE.—*Suture* rather shallow and wide on both sides of the fruit; *skin* very

downy, almost woolly; *colour* pale lemon green, with minute red spots and large blotches of red; *flesh* juicy, palest green flushed bright red, deep red near the stone; *flavour*, when well-grown under glass, rich, not so good from outside trees. A very hard, large late fruit, valuable for its heavy crop. *Leaf glands* round; *flowers* large, rose; *growth* very free and robust; *foliage* very large. A favourite with the market growers.

STIRLING CASTLE.—*Suture* deep and broad, running all round the fruit; *skin* pink, covered with deep red in blotches; *flesh* melting, juicy, pale greenish white, deep crimson next the stone, which is small; free stone; *flavour* rich, vinous, and refreshing. On walls or in peach-houses the fruit is a much darker colour, nearly black, rather rough to the touch. Tree hardy, and bears freely. *Leaf glands* round; *flowers* small.

THOMAS RIVERS.—A very handsome, large, round fruit, ripening at the end of September; free stone; *skin* downy, with a brilliant red flush. It is yet new, but has been very highly spoken of by those who have tested it. *Leaf glands* none; *flowers* large, bright rose; *growth* vigorous, forces well. F.C.C. 1898.

VIOLETTE HÂTIVE.—*Skin* downy, of a pale green flushed with rosy red, and marbled with chocolate red. A grand mid-season peach, and one of the finest flavoured; bears moderately. *Flesh* tender, white, very juicy and melting; *leaf glands* round; *flowers* large, dull pink.

WALBURTON ADMIRABLE.—*Fruit* terminating in a nipple; *suture* broad, and deep on one side; *skin* velvety; *flesh* juicy, white, deeply starred at the stone with dark crimson; *flavour* very rich and vinous in fruits under glass; *stone* very rough, separating freely from the flesh. A valuable late variety. The fruit is very large, but the tree does not bear freely; *leaf glands* round; *flowers* small.

WATERLOO.—*Fruit* flattish, of medium size; *suture* marked; *colour* primrose, with deep crimson cheek, almost black on fruits grown outside; *flesh* sweet, juicy, and good for such an early variety; *leaf glands* large; *flowers* large pale rose, with dark eye.

Dagmar, Doctor Hogg, and Early Louise are excellent peaches when grown under glass, but they are very tender outside. Lord Palmerston and Exquisite are very large and handsome yellow varieties which ripen late, but unless under exceptional cultivation are not worth eating.

AMERICAN PEACHES (Alexander, Amsden June, and Waterloo).—Some cultivators do not succeed with these when forced early, because they keep them too warm at starting. They should have a moderate heat till the blooms are "set," the temperature can be then increased, and the fruits develop quickly.

THE BEST NECTARINES

CARDINAL.—*Suture* well defined; *skin* pale greenish yellow, marbled with salmon red, white patches showing in a net-like form; *flesh* pale greenish white, and very juicy; *stone* large, cling stone; *flavour* brisk, refreshing. A remarkably free-bearing first early variety, very valuable for forcing and pot culture. *Leaf glands* kidney-shaped; *flowers* large, pale rose. F.C.C. 1896.

DRYDEN.—*Skin* almost entirely covered with deep chocolate red, with pale green showing between; *flesh* yellowish white, and very juicy, pale red around the stone, parting freely from a small flattish stone; *flavour* rich, almond-like, refreshing. One of the finest sorts for late and mid-season crops. *Leaf glands* kidney-shaped; *flowers* small, dull salmon red. The tree is vigorous, hardy, and succeeds in all forms.

EARLY RIVERS.—One of the best Nectarines, often reaching 8 oz. in weight. Its skin is almost shining, bright red, pale greenish yellow on the shaded side. *Flesh* greenish. The fruits are very juicy, and have a brisk flavour. A very free bearer. *Leaf glands* kidney-shaped; *flowers* large, pale rose; *growth* vigorous. F.C.C. 1892.

ELRUGE.—*Suture* rather broad; *skin* greenish yellow, mottled with brick red, crimson on sunny side; *flesh* greenish, very juicy, with bright pale red near the stone; free stone; *flavour* rich and brisk. A hardy sort for main crop. *Leaf glands* kidney-shaped; *flowers* small, dull salmon red.



NECTARINE LORD NAPIER PACKED FOR MARKET.

HARDWICKE'S.—*Fruit* large and richly flavoured. It resembles Elruge, but is much larger and darker in colour. *Flesh* greenish, reddish near the stone. The tree is very robust and hardy. One of the best white-fleshed Nectarines. *Leaf glands* none; *flowers* large, foliage bold.

HUMBOLDT.—*Fruit* terminates in a nipple; *suture* deep and broad on one side only; *skin* deep chocolate-crimson, with patches of golden russet; *flesh* deep golden, juicy; *flavour* rich; cling stone. One of the best golden varieties, bears freely and succeeds on open walls, giving a good crop of large fruits; very fine as a pot tree. *Leaf glands* kidney-shaped to round; *flowers* large, very beautiful, deep rose, showy. Worth culture for its blossoms alone.

LORD NAPIER.—One of the finest early sorts. The *fruit* is often very large, primrose and green on the shaded side, with a dull red cheek spotted with gold. *Flavour* piquant; *flesh* very juicy. The *skin* is very tender, and in hot weather it is well to shade the fruits. *Leaf glands* kidney-shaped; *flowers* large, pale rose. F.C.C. 1877.

NEWTON.—*Suture* shallow; *skin* pale greenish yellow, marbled with patches of brownish red and deep crimson, broken by pale spots; *flesh* greenish yellow, with pale red near the stone, very juicy and melting; *flavour* rich and almond-like; free stone; a valuable large late fruit; tree hardy and short-jointed in growth; *leaf glands* round to kidney-shaped; *flowers* small.

PINE APPLE.—*Suture* on one side only; *skin* deep orange crimson; *flesh* yellow to orange, marbled with red near the small and also deeply furrowed stone, firm, rather glutinous in texture; *flavour* rich, sugary; *leaf glands* round; *flowers* large, very handsome, rich rose with dark eye. A rather tender variety, of splendid quality when grown under glass.

PITMASTON ORANGE.—One of the finest yellow-fleshed sorts; the *skin* is deep orange almost covered with deep mahogany red, marbled with golden patches and dots; *flesh* rich and deep yellow, of very fine *flavour*, rather tender outside; *stone* deeply indented; *leaf glands* round; *flowers* large, rich rose, abundant; *foliage* with golden tinge.

RIVERS' ORANGE.—*Suture* shallow all round the fruit; *colour* deep chocolate red, with golden dots on the sunny side, blotched with crimson and russet patches; golden on shaded side; *flesh* dull orange with crimson specks near the stone, which is small (free stone); *flavour* rich, almond-like, and half-sugary; a fine but rather tender variety, safest under glass culture; *leaf glands* round; *flowers* large and beautiful, rich rose with dark eye; *foliage* in autumn has a yellow tinge.

STANWICK ELRUGE.—Similar to Elruge, but rather later, and a deeper red colour with more russet; *flavour* rich, vinous; *growth* free, very hardy, free bearer; *leaf glands* round; *flowers* small; excellent for pots.

SPENCER.—A fine large late variety, rather flat; *suture* very deep; *skin* almost covered with dark crimson, and bronzy red on the sunny side; *flesh* very dark red near the stone; *leaf glands* round and kidney-shaped; *flowers* large. One of the best flavoured.

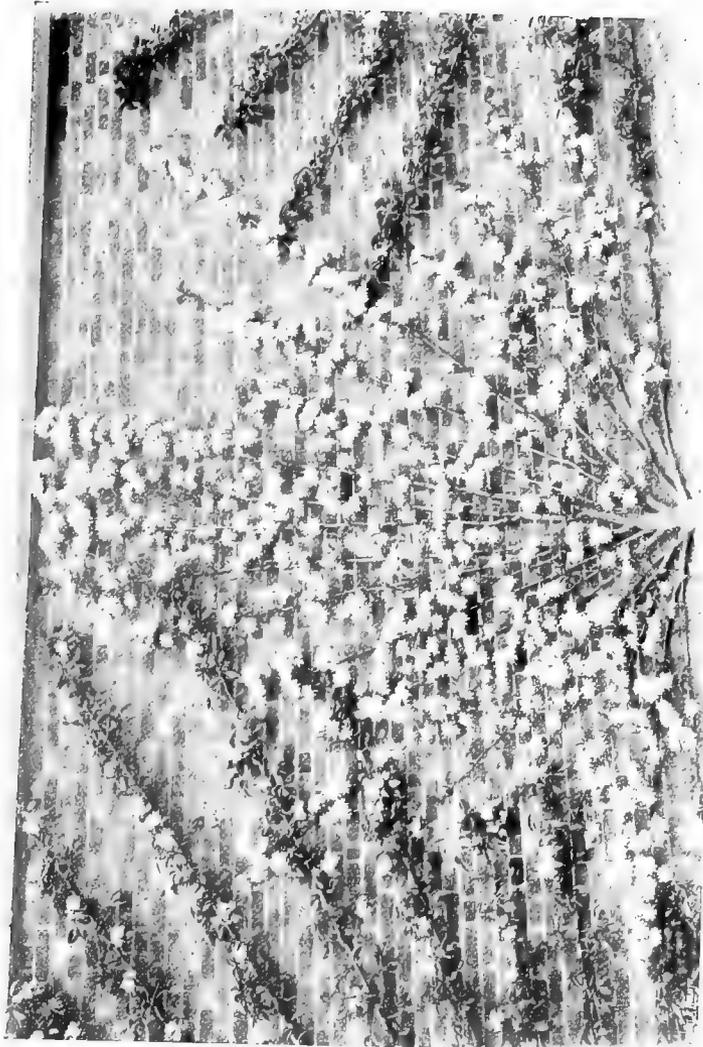
VICTORIA.—A very large and late pointed green fruit, with slight shading of dark chocolate red on sunny side; *suture* very marked; it does not always ripen well on walls, but is extra fine under glass culture and of the most luscious *flavour*; *leaf glands* kidney-shaped; *flowers* large; *growth* very vigorous. F.C.C. 1861.

CHAPTER XII

THE PEAR

By OWEN THOMAS

PUBLIC attention of late years has certainly been more directed towards the importance of the minor industries of the land, both in connexion with the garden and the farm, as bearing on the national food supply and the well-being and happiness of our rural population. As one of these minor industries, pear culture, I think, may lay claim to be most important. There has been an impression that pears of the highest quality cannot be grown in England, but must be sought for in France and the Channel Islands. It is a fact, I admit, that the pears from these places exhibited in our markets and fruiterers' windows are of finer appearance, and sometimes of better quality than those English grown; and it may be reasonably asked, why is this so? Most would, I have no doubt, answer this question offhand by saying that the climate of these countries, being warmer and more suitable for the culture of the pear, is entirely accountable. I have visited the pear gardens both of France and the Channel Islands, where I had an opportunity of witnessing the systems adopted of growing this fruit, to which as much care, attention, and patience are devoted as we give to our choicest fruits under glass in Britain; not only in growing the fruit is this great care manifested, but in harvesting, packing, and marketing also. How does the care and attention given to the cultivation of the pear in this country compare? I regret to say there is no comparison whatever. In England the culture of the pear has never been treated seriously except in Hereford, Worcester, Kent, and a few other counties where orchards exist for the purpose of furnishing fruit for the manufacture of perry. Those growers who have taken the pear in hand for commercial purposes on a large scale in this country are very few indeed, and even in private gardens not many gardeners have given that time and thought to the subject which is absolutely necessary if the best results are to be obtained. Judging from the few pear orchards that still exist in the neighbourhood of London and other favourable districts, our forefathers thought a great deal more of this fruit than we of the present generation do. Many of these old pear trees are of huge size and great age, and all on the pear stock. They have received hardly any attention as regards manuring, pruning, or thinning the fruit, yet it is largely from these that pears are supplied to our poorer markets, and even the half-grown, bruised, and fallen fruits command a ready sale at fair and remunerative prices. It is clear that if English cultivators are to compete with success against French and Channel Island growers, greater care and skill must be given to the industry. The relative



FAN-TRAINED PEAR TREE IN BLOSSOM.

excellence of English and Jersey pears was forcibly brought out at the great Hardy Fruit Show held by the Royal Horticultural Society at the Crystal Palace in 1901, where an excellent collection of hardy fruit, chiefly pears, was exhibited by a Jersey firm. Excepting a few dishes where the specimens were larger, the best English samples on view were equal in every respect to the Jersey ones.

A great improvement in the methods of cultivating the pear has been quietly taking place for years—ever since the Quince has been substituted for the Pear stock for grafting and budding. It is an old saying (and was a true one) that “he who plants pears plants for his heirs.” This no longer is the case, however, as the pear worked on the Quince will yield fruit in half the time it takes when grown on the Pear stock. This fact has already done much to encourage pear tree planting, and has resulted in a generally improved quality in the fruit. Another point of importance is that the old belief that a warm wall was absolutely necessary for successful pear culture is exploded; it has been proved that a great number of our choicest varieties, formerly thought to require a wall to bring them to perfection, can be grown better, certainly as regards flavour, in the open garden; and this fact when widely known will, I trust, be the means of increasing pear growers in this country a hundred-fold, especially in the warmer counties where conditions are favourable.

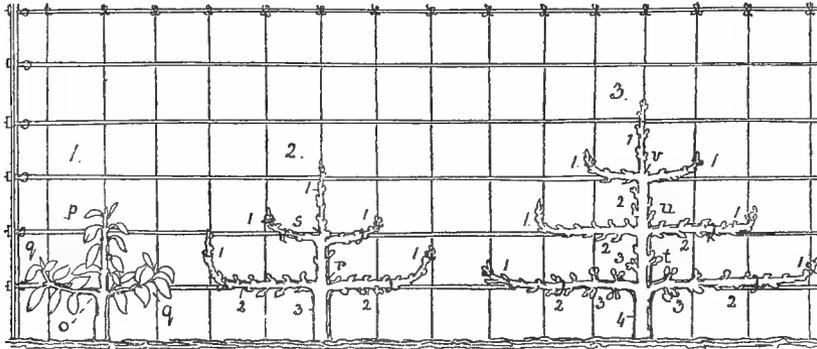
PEAR TREES ON WALLS

Although, as I have already stated, a wall is now proved not to be indispensable to successful pear culture, there are varieties of great excellence which can only be grown successfully on walls, even in the south of England; in the Midlands and the north the wall would be still more necessary.

SOIL.—The first question to engage the planter's attention must be the nature of the soil he has to deal with, and, next, the drainage. Should the land be either heavy clay or poor light soil it should be cleared away to a depth of $2\frac{1}{2}$ feet and 9 feet wide for each tree, and filled in again with good turf. Add a small quantity of road scrapings, lime and mortar rubble, two barrow-loads of horse manure, and one bushel of $\frac{1}{4}$ -inch bone manure to each cartload of soil. The turf should be left in pieces the size of half a brick; mix the soil well before planting. This amount of soil will suffice for the tree's requirements for many years. If the existing soil is good the land should be trenched $2\frac{1}{2}$ feet deep and 9 feet wide, some of the worst soil thrown out, and fresh soil mixed as advised above. Keep the new soil fairly near the surface. Should the drainage be unsatisfactory, then means must be taken to improve it as advised for peach borders.

FORMS OF TREES.—Horizontal and fan-trained trees are usually planted against walls, and of the two I prefer the latter, as I believe a more regular and better crop is obtained by this mode of training, especially when the trees become old. However, the pear succeeds well both ways. Where the land is poor and light and the wall of a good height, and one wishes the tree to cover a large

space, one worked on the Pear stock should be planted; but if the land is heavy, then the Quince stock is to be preferred. The roots of the former are strong, and have a tendency to penetrate deeply into the soil, which in the case of light land is an advantage, whereas the roots of trees worked on the Quince keep near the surface, and on cold and heavy soils the danger of many

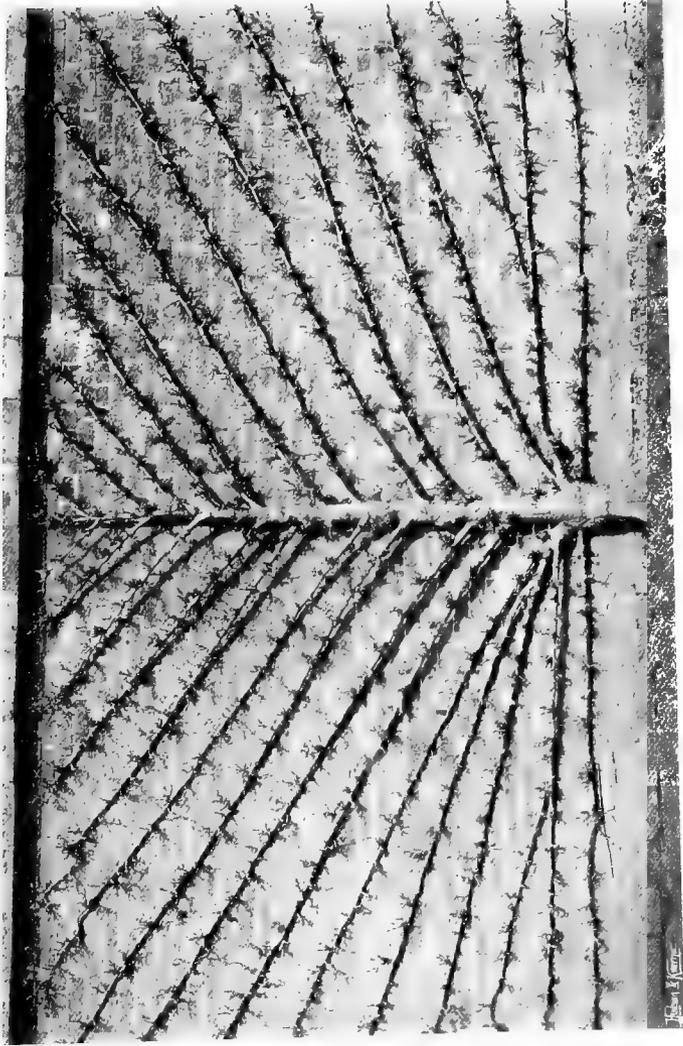


FORMS OF PEAR TREES FOR WALLS AND ESPALIERS

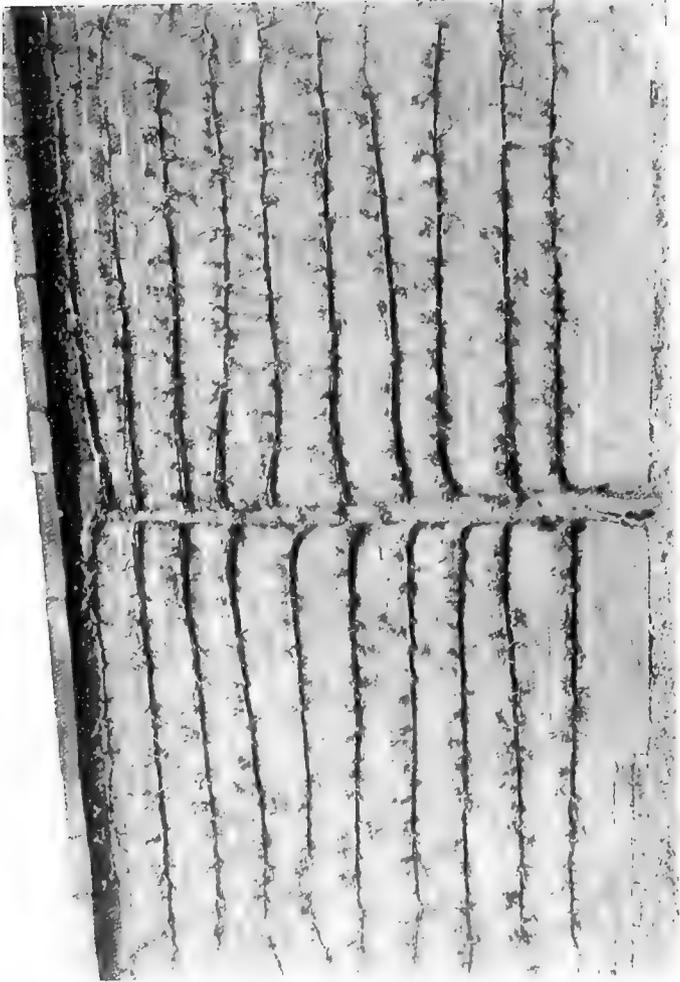
1. "Toasting Fork" tree first year after cutting down maiden tree; (o) point of cutting maiden tree, 1 foot from ground; (p) growth from uppermost bud in following spring, which must be topped at about 12 inches, in midsummer; of the shoots that push afterwards the uppermost should be trained upright, pinching others to one leaf; (q) side growths not stopped, but trained full length, and when about a foot long trained upright. In autumn the tree has three branches. Such form has received the fanciful name of "Toasting Fork." The chief thing to aim at in these trees is equality of vigour, this being effected by stopping the strongest or all the three branches when about 12 inches long, training one of the shoots that push as an extension, suppressing all side growths at the third leaf, and cutting back to one in winter. It is a useful form for pillars, also when space is limited, or variety is required on low walls or espaliers.
2. Candelabra tree; (r) point of cutting back maiden tree originating three growths; one is trained upright, and one on each side; (s) point of shortening leader at second winter pruning, again originating three growths to form the tree of five branches. This form also represents the horizontal and upright modes of training combined. The branches are originated and trained on the principle of the "Toasting Fork" tree. When the two lowest horizontal branches have extended 2 feet from the stem, they are trained upright, and the second tier of horizontal branches is trained upright 1 foot on either side of the stem; by suppressing the leader the side branches acquire vigour, so that all are ultimately on a level.
3. Palmette Verrier tree; (t) point of first pruning; (u) second shortening; (v) third pruning. The Palmette Verrier is simply the "Toasting Fork" and "Candelabra" extended. Two side branches are originated each year, and these are trained horizontally at 1 foot apart until a sufficient number is obtained to cover the allotted space; the vertical training is facilitated by temporary wires affixed to the trellis, as shown. The object of the Palmette Verrier is to secure as much vigour in the lower branches as in the higher ones. It is a pleasing and productive form for espaliers and walls. Numerals refer to age of wood.‡

of the best roots penetrating deeply is avoided. In planting fruit trees it is a safe plan to place them the same depth in the ground as they were in the nursery, and this depth is always apparent by a soil mark on the bark of the tree. This is important, as in the case of the tree on the Quince it is imperative to plant deeply enough to cover the union of stock and graft.

TREES ON THE PEAR STOCK.—After the second year's growth it may



FAN-TAINED PEAR TREE WITH CENTRAL STEM



HORIZONTALLY-TRAINED WALL PEAR TREE.

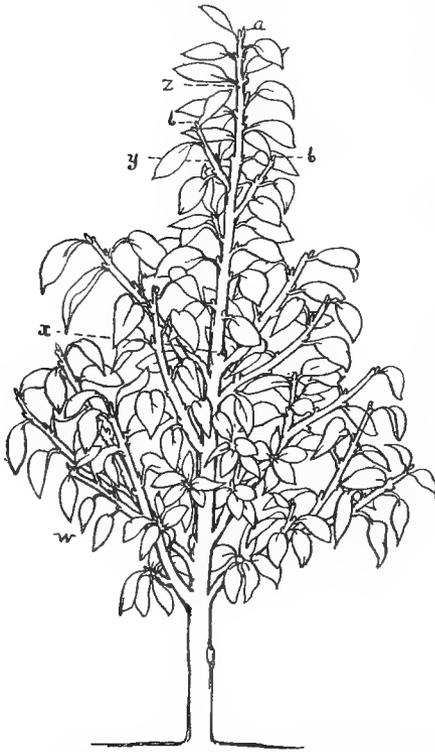
be found that the young tree on the Pear stock has made some strong growths, and also some strong roots, which, on examination, will be seen to be making their way towards the subsoil. There is nothing for it then but to lift the roots with all possible care, prune them, and carefully replant the tree, adding a little fresh soil to the roots as the work proceeds. If this is carefully carried out scarcely any check to the growth of the tree the following season will be apparent. After root-pruning the tree will not require further attention in this respect for many years, but should strong growths again arise, in the course of two or three years, do not lift the tree, but endeavour to find the coarse roots by clearing a passage with a fork here and there under the tree where the offending roots are most likely to be found, and this, as a rule, is directly beneath the strong growths.

TREES ON THE QUINCE STOCK.—In this case the treatment differs considerably, as the tree will tend to form a mass of small fibrous roots near the surface; the grower must encourage the formation of these, and the best way of doing this is to top-dress the border regularly every year, adding after the operation a mulching of about 3 inches of decayed manure, and placing a ridge of soil about 3 inches high round the tree at a distance of about $2\frac{1}{2}$ feet from the stem, so as to form a basin for retaining water. As the roots are not far from the stem it will be seen how necessary it is thus to nourish the tree, not only by top dressings, but also by frequent applications of water in hot weather.

TOP-DRESSING.—Autumn is the best season for top-dressing. The old material should be removed before the new is added, and every two or three years it will be necessary to dig out a trench, $1\frac{1}{2}$ feet deep and the same in width, all round the tree as near the points of the roots as it is safe to go without injuring them, and fill it with fresh soil. By this means a large number of new fibrous roots will constantly be added to the tree, greatly helping it to produce and mature heavy crops of fruit. In the south of England, and in most of our fairly warm counties, no doubt the best aspect for the pear is west; it will also succeed on a south or south-west, but does not grow so well on an eastern aspect. In cold northern counties the only chance of growing late pears successfully is to plant them on south walls.

TRAINING.—If it is decided to cover the wall with horizontal-trained trees, a tree three years old had better be purchased from a trustworthy nurseryman, who will guarantee that the variety is true to name. It should have a main stem 3 feet long, and side branches from this in a horizontal direction, from 10 inches to a foot apart, the lower ones being a foot from the ground. When the young trees are established the main stem should grow 18 inches to 2 feet every year. This at the pruning season must be cut to within a foot of the last pair of branches; the three top buds should produce three shoots, one on the left hand and one on the right, one being trained upright to continue the main stem. These must be taken great care of by being tied to the wire or nailed to the wall as growth extends. The same process of pruning the main stem to provide side branches must be carried out every year until the top of the wall is reached, and side branches 1 foot apart have been

furnished from base to summit. It is possible to furnish a wall more quickly



PYRAMIDAL TREE, IN THIRD SEASON'S GROWTH

(*w*) Point of cutting back maiden tree 1 foot from ground; (*x*) point of second pruning, four side branches and a leader being reserved the year following pruning; (*y*) point of stopping, as soon as 12 inches length attained; (*z*) growth from uppermost bud again pinched, if making more than three or four joints; (*a*) terminal growth resulting from second pinching, say early in August; (*b*) side growths pinched after first stopping of leader, and stopped at third or fourth leaf if making more growth. This pinching enables the worker to dispense with winter shortening of the leader. The side branches are also pinched at 6 to 8 inches when necessary to preserve the symmetry of the tree (see side branch page 121), the first tier of branches is shown forked, with spurs on the two-year-old wood, so that fruit may be had in the fourth year.

by stopping the main stem in summer when it is a foot long, thereby forcing new growths immediately below. From these growths one is selected to form the main stem, and one on each side to be trained horizontally as before. I do not recommend this plan, however, as the shoots obtained from green and soft wood will never prove so strong and serviceable afterwards as those which have had the whole summer wherein to grow and mature. Moreover, it often happens that from the summer stopping only one or perhaps two shoots will result, thus defeating the object in view.

In the case of the fan-trained tree, the framework will already have been formed before it comes into the grower's hands (supposing he plants a tree three years old), and all he will have to do is to add to its main branches year by year until the tree has filled its allotted space.

DISTANCE APART TO PLANT.—This must be determined by the height of the wall. Where the walls are 12 feet high, 20 feet apart will be the proper distance, with tall standard "rider" trees between, in order to cover the walls in the shortest possible time with fruitful trees. On walls of lower height the trees should be planted 15 to 25 feet apart.

SPRING AND SUMMER PRUNING.—Under this heading is included thinning out the blossom buds when too numerous, disbudding, stopping, removing lateral and sublateral growths. Where summer pruning is properly carried out, winter pruning becomes almost unnecessary. The pear as a rule, like most other fruit trees, produces more young shoots and blossoms on its branches in spring than can be properly developed, and it is to release it of this unnecessary burden and help it to

produce better fruit and more fertile branches that disbudding is resorted to. We will take the previous year's main shoots first. These will very seldom show any blossom buds the first year, although occasionally a few are formed at the extreme ends of the shoots, and they should be allowed to bear fruit, as usually it is of excellent quality. These young shoots will vary in length from 12 to 18 inches, and will, when breaking into growth in spring, produce from eight to twelve or more small shoots. Five will be quite enough to furnish spurs for this length of shoot for the following year, therefore they should be reduced to this number, and so that they are equally distributed the whole length of the shoot. Spring and summer pruning possess one great advantage over winter pruning, because then it is impossible to be in doubt as to which is a flower bud and which is a wood bud.



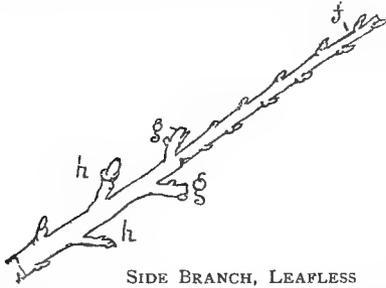
SIDE BRANCH IN GROWTH

(c) Extension growth stopped; (d) side shoots shortened to three leaves, not counting small basal ones; (e) spurs.

When winter pruning nothing is more difficult to the amateur and beginner than to be able to tell the difference between a wood bud and a fruit bud. The fruit buds are short, thick, and blunt at the end, containing as they do the embryo flowers. The wood bud is longer and thinner, and tapering instead of being blunt at the end. Having explained the manner in which last year's shoots should be disbudded, it only remains now to treat of the main branches in the same way. They ought to have flowering spurs at least every 10 inches, each of which often produces three or four clusters of flowers. These should be reduced to two, reserving, of course, the best. Two clusters would really be enough, as at most we can only have two fruits to a spur; but as frost and much inclement weather have to be reckoned with, we must be on the safe side, and consequently retain two of the clusters of flowers until a good set of fruit is secured.

Wood buds on the main branches are also usually produced in superabundance. Numbers of these will cluster round the blossom buds, and should in the first instance be reduced by disbudding to three at distances apart of 6 to 8 inches all along the branch, afterwards reducing them to two if any tendency to overcrowding is observed. The shoots from these wood buds should be allowed to grow freely until about the middle of July, by which time they will have attained almost their full length, then they should be cut back to within six or seven buds of their bases. (Terminal shoots, or those wanted to fill any vacant spaces, should be retained their full length.) Cutting back the shoots will help the development of the fruit buds at their bases, and also exposes the tree and its crop of fruit to more air, light, and warmth. All subsequent shoots that may form should be stopped at the fourth

leaf. By some growers the system is advocated of stopping the growth of these shoots as soon as they have developed five or six leaves, instead of leaving them



(*f*) Extension growth not shortened because neither too long nor sappy unripe laterals present; (*g*) side shoots spurred in; (*h*) spurs on which fruit may be produced the following summer.

to grow their full length, as recommended above, maintaining that by this plan the whole energy of the tree is concentrated in an effort to develop and strengthen this growth, and so prepare it more effectually to produce at its base stronger and better blossom buds. To small cultivators whose fruit plantations are primarily intended to give recreative employment and pleasure, this system may be practised with advantage. Good crops of excellent fruit may be secured in this way, but the natural and healthy development of the tree is undoubtedly retarded. Under this method stopping must be continued during the season, the second, and third, and any subsequent

growths being pinched at the third or fourth leaf. This plan is suitable for gardens of limited extent where one wishes to grow many kinds of fruit trees, and where large trees are not desired.

ESPALIER-TRAINED TREES.—I am of opinion that no system of training is better adapted for the successful culture of the pear than the horizontal espalier. It affords to the tree all possible exposure to light, heat, and air. Espalier trees may be had in many forms, but the one most commonly adopted, and which I believe to be the best, is the horizontal espalier. The espalier or fence is formed by fixing upright iron bars (using hot lead as cement), into stones about 15 inches square, and sunk in the ground to the same depth. These upright bars should be formed of $1\frac{1}{2}$ -inch iron, and should be 5 feet above the ground and fixed 6 feet apart. This height will admit of five rows of wires, 10 inches apart, upon which to train the branches, the basal wire being fixed at 10 inches from the ground and the top one being 4 inches below the top of the bar. At each end of the trellis strong posts must be placed, to which the wires can be fixed tightly, and if the length of the trellis is above sixty yards a middle straining post must be fixed. For this high trellis the size of the wire should be $\frac{1}{8}$ inch in diameter. To any one contemplating the culture of the pear on the Quince stock on a large scale for commercial purposes, I can strongly recommend this form of training. The espalier trellises should be fixed at 12 feet apart, and should run from north to south. Plenty of light and air would then reach the trees, and the land between the trellises be of greater value by reason of the protection and warmth afforded by the trees; it could be utilised for the culture of strawberries, early crops of vegetables, &c.

At the Royal Gardens, Windsor, a very elegant trellis was successfully and

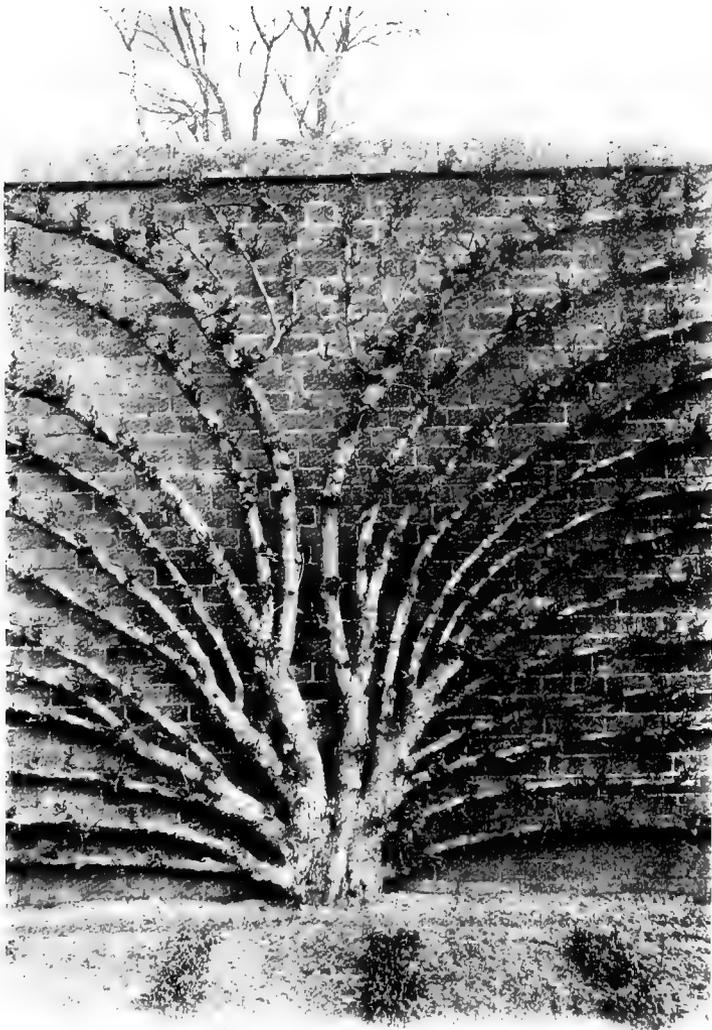


SHORT STUBBY SHOOT

That must not be pinched in summer and shortened in winter, for such, as in this instance, is often terminated by a blossom bud.



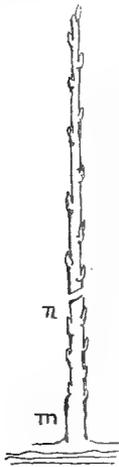
PEAR TREE ON AN ARCHED TRELLIS, ROYAL GARDENS, WINDSOR.



*A VETERAN HORIZONTALLY-TRAINED PEAR TREE
AT HEWELL GRANGE.*

FEEDING.—This term as applied to man and beast is well understood, and its importance recognised, but with regard to a fruit tree the expression may seem inappropriate, but in reality it is not so, as without due and intelligent attention to this matter success is impossible. To emphasise this point I need only draw attention to the amount of thought and care which is given to this subject in the case of the vine, the peach, the pine, the melon, &c. If the same results are to be obtained, the same practice more or less must be applied to the pear. I have already advised that a ridge of turf should be placed round the base of the stem, so as to form a sort of basin to hold water. Without a provision of this sort there is danger that the water given may filter away into other courses and be wasted. The season during which stimulants may advantageously be applied to the pear is from June to August, that is, from the time the fruit is the size of a cob nut until it is nearly fully developed, and for this purpose there is nothing better than clear liquid manure from the stableyard or the cowshed, occasionally using guano water instead. Late Pear trees should be fed until the end of September. Twice

during the season a slight sprinkling of nitrate of soda washed in with water will be of great service. With regard to old and large pear trees, whether in the open or against a wall, more especially the latter, there is no doubt, I think, that the cause of their unsatisfactory condition and indifferent fruiting which one often notices, is frequently caused by dryness at the root. Let me recommend my readers to have them thoroughly and copiously watered in the course of the winter months with weak manure water if possible. In pulling up such trees to be thrown away who has not observed the dust-dry condition of the ground under the roots, therefore do not be afraid of giving heavy waterings occasionally in winter to old and large fruit trees.



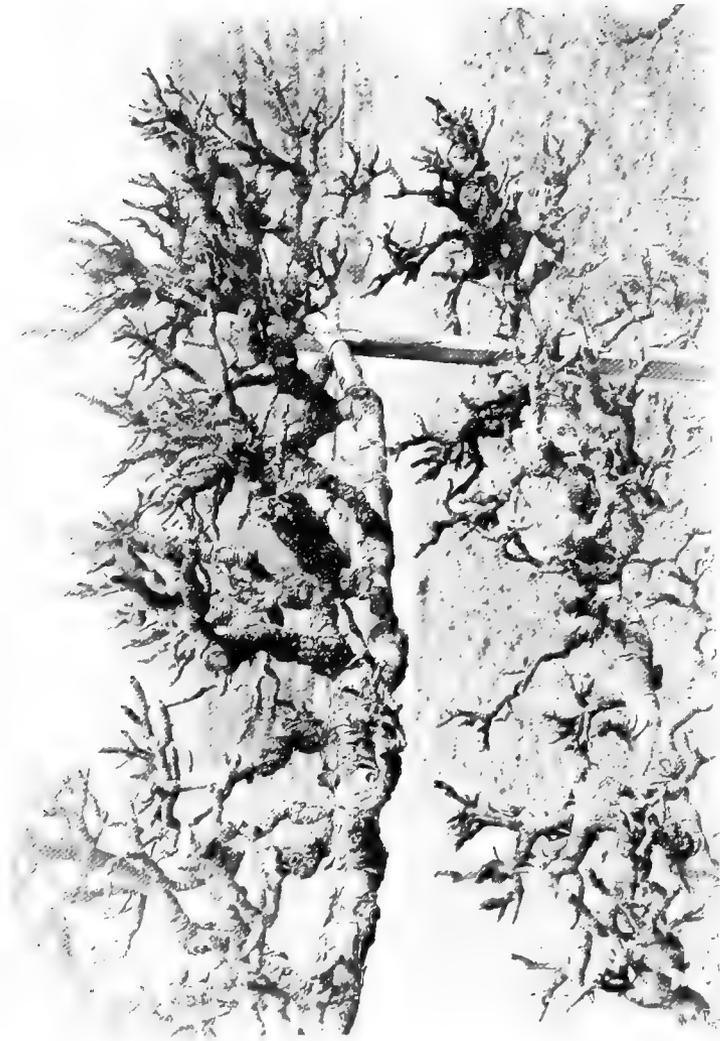
MAIDEN TREE
(ONE YEAR OLD
FROM BUD)

(*m*) Stock; (*n*) point
of shortening
growth from bud
to 12 inches from
ground.

GATHERING AND STORING THE FRUIT.—This is one of the most interesting, and certainly one of the most important, duties in connection with the cultivation of the pear. As a general rule it may be safely affirmed that in the case of nearly all the early and mid-season pears, they should be gathered some little time before they are ripe, that is, immediately they show signs of separating from the tree. This can easily be ascertained by taking the fruit in the hand and raising it, when, if fit to pull, the stalk will easily part from the branch. Some early sorts if allowed to become ripe on the tree quickly deteriorate in flavour. In the case of late pears it is different. These should be allowed to hang on the tree as late as possible until there is danger of frost, and even a little frost, say five or six degrees, will not hurt them. As regards the storing or the disposal of the fruit, if intended for market the early and mid-season sorts should be despatched certainly ten days before they are ripe, otherwise much loss and damage will result by bruising. When for home consumption



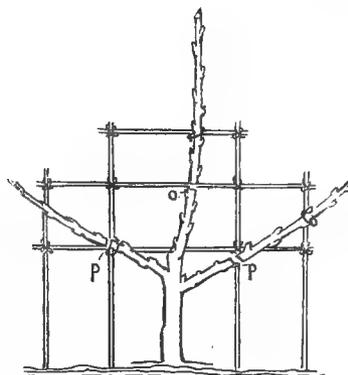
DOUBLE CORDON PEAR TREES ON WALL.



FRUIT SPURS OF AN OLD ESPALIER PEAR TREE AT CHISWICK.

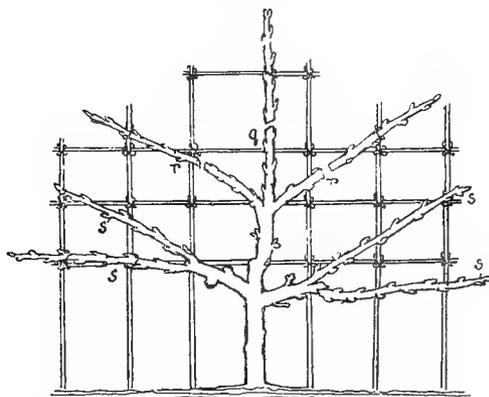
the best way I have found for gathering and storing fruit is to have shallow baskets, $2\frac{1}{2}$ feet long by $1\frac{1}{2}$ feet wide, and 6 inches deep. These, when full, are placed on a long barrow, with ends only and no sides, having springs under the wheels to prevent jolting.

Where there is a good collection of pears grown it is well, if possible, to have a special fruit-room for storing them in, for the reason that the flavour deteriorates if the fruits are harvested in a room where the temperature is low. The apple, for instance, will withstand a much lower temperature without injury than will the pear. It goes without saying that before the season of fruit gathering begins the fruit-room should be well cleaned, and if necessary whitewashed. In harvesting pears it is a good plan to lay the earliest to ripen on the shelves most convenient to hand, so that



ONE YEAR FAN-TRAINED TREE

(o) Leader shortened to 6 inches; (p) side shoots shortened to 6 inches; the growths are secured in the preceding summer to an improvised trellis of stakes and rods as shown.



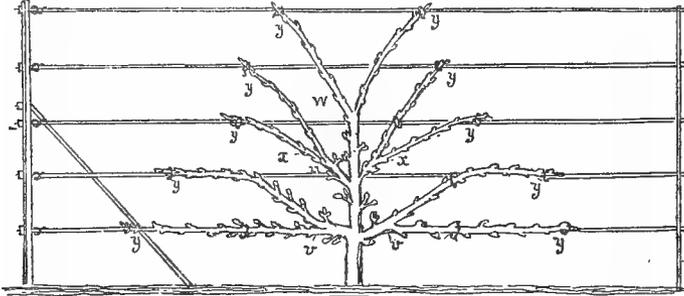
TWO YEAR FAN-TRAINED TREE

(g) Leader shortened to 6 inches; (p) side shoots shortened to 6 inches; (s) growths from side branches not shortened. It is not necessary to shorten any of these shoots. Two growths are secured from the upright branch in the following summer, and two from each of the upper side branches, while a shoot is taken forward from each of the four lowest branches. Thus ten branches will be secured and will quickly cover an espalier or wall, 5 feet in height. If the tree two years trained is required for a higher espalier or wall than 5 feet, three shoots must be secured from the upright (instead of two as for a 5 feet high espalier), thus securing eleven branches, and from these any number of others may be originated to cover the space.

they can be easily and quickly looked over, and the bruised and decayed ones taken away. Late pears may be placed on less accessible shelves, as they will require little or no attention in this respect until the early ones have been disposed of.

SINGLE OR DOUBLE CORDONS ON WALLS.—This is an interesting and successful method of cultivating many varieties of pears. It is interesting from the fact that a large number of varieties may be grown on a limited wall space, thereby giving the amateur and the small grower an opportunity of growing a number of distinct fruits. This is an important matter, in that it enables the cultivator to enjoy the advantage of ripe pears in season, say from August to Easter. Larger and more handsome fruit can be grown by this method than in any other way, although it must be said that quantity is somewhat

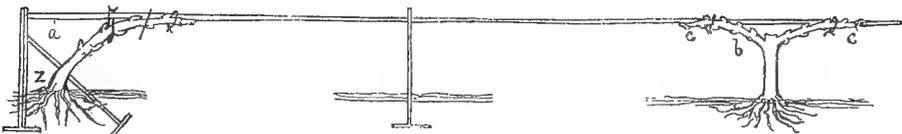
sacrificed. This system is not recommended where heavy crops are the chief desideratum. The single cordons should be planted 18 inches apart, and the double



MODIFIED FAN AND HORIZONTAL TRAINING

Three-year trained tree on a 5 feet high espalier; point of cutting back maiden tree is about 12 inches from ground; (*z*) point of shortening leader at second pruning to 1 foot; (*w*) point of cutting back side shoots to 6 inches; (*w*) point of shortening leader at third pruning; (*x*) point of shortening side shoots at third pruning; (*y*) branches originated for covering the trellis. This method combines the principles of the fan and horizontal training. The tree is trained with an upright stem, the maiden growth and the subsequent leading growths are shortened each year to 12 inches, and side growths originated at this distance. They are shortened to 6 inches so as to produce two vigorous growths from each, training them as shown. In this particular the system is that of the fan, but when the several growths reach their respective wires of the trellis each is trained horizontally. By this mode the trellis is furnished with branches in four years from the bud instead of six years, as by the horizontal method. The system is applicable to any height of espalier or wall, and obviously doubles the speed of forming branches for horizontal training in all but the first and last years of shortening the leader.

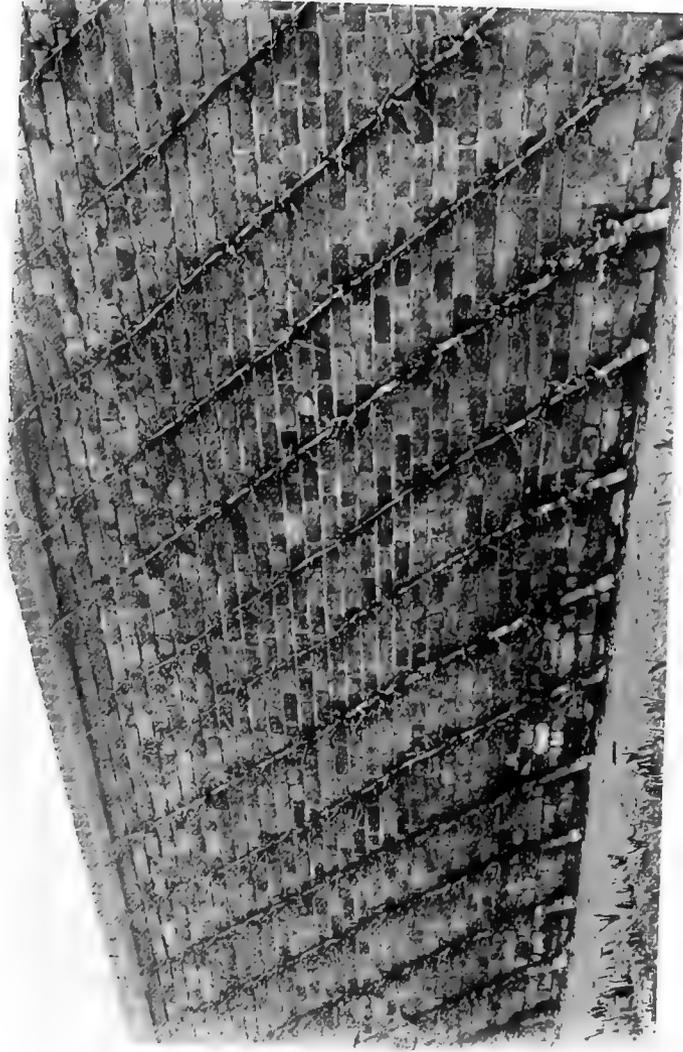
cordons 3 feet apart. In the first instance I recommended single cordons as best, for the reason that when the single cordon has reached the top of the wall it is an advantage to the tree to encourage a second cordon from the base of the stem,



SINGLE AND DOUBLE HORIZONTAL CORDONS

Properly planted and secured to wire not less than 1 foot from ground; (*s*) maiden tree planted at an angle of 45°; (*a*) horizontal wire. The tree if well rooted and not unduly vigorous may be left intact, if not well rooted, shorten to the cross line, about one-third of its length. In the spring after planting cut off all growths below the wire and take forward a strong leading shoot from the upper part and train it horizontally. All others having made five or six joints of wood stop back to three or four leaves, cutting them in autumn to one or two buds. It is not necessary to shorten the leading growth until its limit is reached. Double horizontal cordon, one year trained: (*b*) point of cutting back maiden tree; (*c*) shoots to form branches, all others rubbed off.

with the object of converting the single into a double cordon. This new development will give the single cordon more room and result in healthier



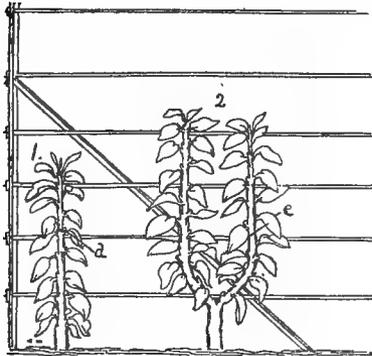
SINGLE OBLIQUE CORDON PEAR TREES.



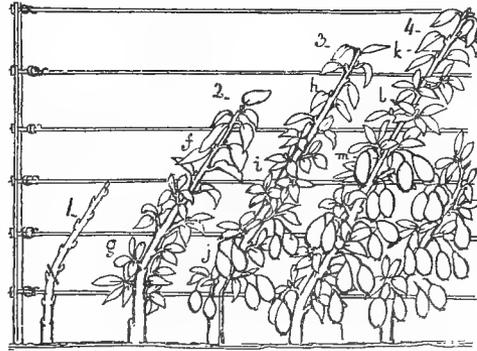
*PEAR MARGUERITE MARILLAT AS A CORDON
ON WEST WALL.*

and more fruitful growth ; it is to be recommended on all occasions where practicable. If worked on the Quince stock, as all cordon pears should be, they will remain fruitful for many years after they have filled their allotted space on the wall, especially if the wall is a high one, say 12 feet. But they would undoubtedly succeed better and live longer if allowed gradually to develop into double ones as suggested above. In the case of a low wall, say 8 or 9 feet, double cordons should be planted in the first instance.

Apart from the interest and utility cordons possess in their adaptability for



VERTICAL CORDONS



DIAGONAL CORDONS

1. Single maiden tree in growth from bud ; (*a*) point of shortening at winter pruning, about half its length. In the following spring retain the strongest shoot as leader, and when it has grown 12 inches pinch out the point. If this is done by midsummer, it will grow again ; reserve the strongest growth, training it upright, pinching the other to the third leaf. Shoots on the previous year's wood are treated similarly. At the winter pruning the leader need only be shortened to well-ripened wood, or, if well matured and the second growth short, leave full length, cutting pinched side shoots to a bud or two. Subsequent years' treatment is similar.
2. Double tree one year trained (in leaf) ; (*e*) point of shortening growths at winter pruning. Following spring and summer treatment same as for single cordon.

Single cordon four years trained. 1. Maiden tree properly planted and secured to trellis. If well rooted and not too vigorous, it need not be shortened, otherwise it must be shortened to the cross line so as to secure a vigorous growth for extension. 2. Second year from bud, maiden tree not having been shortened ; (*f*) continuation growth ; (*g*) previous year's wood on which spurs have formed. 3. Third year ; (*h*) extension growth ; (*i*) previous year's wood with spurs ; (*j*) three years' wood bearing fruit. 4. Fourth year ; (*k*) extremity growth and limit of trellis ; (*l*) previous year's wood with spurs ; (*m*) three years' wood fruiting ; below four years' wood in bearing. In trees trained diagonally the flow of sap is more evenly distributed than in the vertical, consequently more vigour is imparted to the lower parts.

the requirements of small gardens, they have a special advantage in the case of any large or small garden with new walls, and where it is desired to furnish them immediately and without loss of time with fruitful trees. Cordons can be purchased at reasonable prices, from 6 to 10 feet in height, and clothed from base to summit with fruit-bearing buds, and they return to the grower the first year after planting a satisfactory yield in a crop of excellent fruit. It may here also be stated that to those wishing to grow large and handsome pears, either for private dessert or for exhibition purposes, there is no method of culture which will secure this result so successfully as the cordon tree. A

word of caution is necessary as regards the selection of varieties; much disappointment and loss will be experienced by indiscriminate planting. I may say at once that it is useless to plant those varieties which are known to be weak and poor growers. When subjected to restriction, as they naturally are under this system, in time they absolutely refuse to grow at all. Therefore in selecting cordon trees be careful to order those varieties only that are known to be of good constitution and free growth, and amongst them I may enumerate the following as being suitable for this purpose, and also as affording a supply of first quality dessert fruits from August to Easter. These varieties are also well adapted for growing on walls as horizontal or fan-trained trees.

VARIETIES FOR WALLS

AUGUST.—*Beacon, Doyenné d'Été, *Beurré Giffard, *Clapp's Favourite, Grégoire Bordillon, *Jargonelle, Souvenir du Congrès.*

SEPTEMBER.—**Williams' Bon Chrétien, *Beurré d'Amanlis, Beurré superfin, Brockworth Park, *Fondante d'Automne, *Triomphe de Vienne, Madame Treyve, Marguerite Marillat.*

OCTOBER.—*Bergamotte Hamburg, *Beurré Bosc, Beurré Capiaumont, Beurré Fouqueray, *Beurré Hardy, *Beurré Brown, *Comte de Lamy, Doyenné Boussoch, Gratioli of Jersey, *Louise Bonne of Jersey, Marie Louise d'Uccle, *Pitmaston Duchess, *Seckle, Magnate.*

NOVEMBER.—*Durondeau, Baronne de Mello, Beurré Clairgeau, *Conference, *Doyenné du Comice, Hacon's Incomparable, *Marie Louise, *Thompson's, Van Mons Léon Le Clerc, *Duchesse d'Angoulême, *La France.*

DECEMBER.—**Beurré d'Anjou, Beurré d'Arenberg, Beurré Bachelier, *Beurré de Jonghe, Chaumontel, *Doyenné d'Alençon, *Glou Morceau, Knight's Monarch, *Marie Benoist, *Winter Nelis, *Beurré Diel.*

JANUARY.—**Nouvelle Fulvie, *Beurré Sterckmans, *Easter Beurré, Jean de Witte, *Le Lectier, Président Barabé, Vicar of Winkfield, Zéphirin Grégoire.*

FEBRUARY.—*Marie Guisse, Duchesse de Bordeaux, *Olivier de Serres, *Passe Crassane, *Nec Plus Meuris, Beurré Perran.*

MARCH TO MAY.—**Bergamotte Esperen, *Beurré Rance, *Josephine de Malines, Anna Nelis.*

Where it is desired to have a limited collection, those varieties marked with an asterisk should be grown.

THE PEAR IN THE OPEN

By GEORGE BUNYARD

Under orchard culture only a few varieties of pears are suitable for market. It is in the cultivated garden that they are valuable for dessert and culinary purposes by reason of their long season. They can be grown as standards in the outer garden above the coarse vegetables, or as pyramids and bushes upon the Quince stock by the sides of the garden paths planted from 6 to 12 feet apart, but the fruits attain perfection when grown upon walls facing all points but the north. Some prefer pear trees as fan-trained or horizontally trained espaliers upon the Free or Pear stock, planted 15 feet apart.



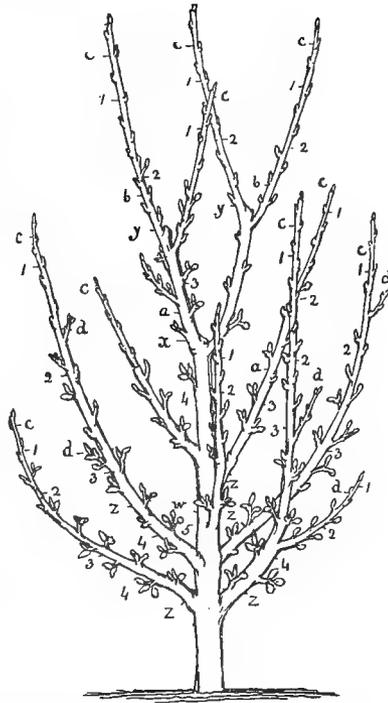
YOUNG PYRAMID TREE OF PEAR CHARLES ERNEST.



They may be grown as cordons upon the Quince stock, planted against walls at 2 feet apart. When properly pruned and root-pruned pears are very fertile in any form. The early varieties thrive well on walls facing east, the mid-season sorts on a west wall; the late varieties should be planted against walls with a western or southern aspect, as they require considerable warmth to perfect their fruits. They should be fed with water and stimulants well into October.

All the early pears, such as ripen before October, should be gathered a few days before they are really ripe, otherwise such varieties as Jargonelle and Williams' Bon Chrétien become mealy and soon decay. All the fruits should not be gathered at once. The shaded fruits will hang some days after the exposed ones are gathered. Such a delicate fruit as the pear must be carefully picked, without bruising, and be stored at once.

Enquiry is often made as to when pears should be picked. Only general rules can be given. Should the fruits fall from the trees without any apparent cause a few should be cut open, and if the pips (seeds) are black the fruits may be considered ready to store. The fruits of some late varieties should remain on the trees until November, and when the stalk end grows over the spur it may be taken as an indication that the pear is ready to gather. Again, if when gently lifted up it parts readily from the spur the fruit may be picked. Amateurs should not be alarmed if a few fall, as they are frequently diseased and do not indicate that all the fruits are ripe. Finely developed fruits should be the cultivator's aim. They should be thinned as soon as well



A BUSH PEAR TREE (5 YEARS OLD)

(w) Point of shortening the first growth from the bud or graft; (x) point of second pruning of leading growth; (y) point of third pruning; (z) side branches originated the first year; (a) branches formed in second season; (b) branches originated in third year of pruning; (c) leading growths of branches; (d) subsidiary growths allowed to remain for furnishing the tree with branches about 1 foot distant from each other. The numerals refer to the ages of the shoots. The tree is formed by cutting back maiden trees to 15 to 18 inches from the ground, so that the lowest branches are well clear of the soil. Of the growths pushing, five or six of the most promising and well situated are retained, and the others rubbed off, thus leaving four or five side shoots and a leader. Side growths or laterals on any of these are pinched at the first leaf as produced, cutting below the first stopping at the winter pruning; as some basal buds will be left, spurs will form the following summer. At the winter pruning the leader is shortened to 15 inches, and the side shoots, if over a foot in length, topped, otherwise left intact. The next spring four to six shoots push from the stem and are encouraged, but not a leading central growth (the absence or presence of this marks the difference between a bush and a pyramid tree); lateral shoots are pinched to three leaves, not counting the small basal one or two, and they are shortened to one or two buds at the winter pruning following. Short stubby shoots are not pinched or winter pruned, as on these the fruit is produced. In winter the uppermost shoots are shortened to about 15 inches to cause them to fork, and the leading growths of the side branches are treated as in the preceding season; subsequent pruning is simply a repetition.



A PYRAMID PEAR TREE (5 YEARS OLD)

(c) Point of cutting back maiden tree; (f) point of second shortening; (g) point of third cutting back; (h) point of fourth shortening of leader; (i) point of stopping leading shoot in summer; (j) continuation growth of leader made after pinching; (k) side growths made in consequence of stopping leader. The numerals refer to the age of the wood. Practically such tree requires no winter pruning. The pyramid is formed by shortening the maiden tree to 15 inches from the ground, and five to seven shoots originated; one is taken upwards, secured to a perpendicular stake, the remaining ones selected are retained in the best positions, all others being rubbed off. The following winter the leader is shortened to 15 inches, or 18 inches if strong, and at least four shoots will grow in spring, one to be trained upwards as continuation of the stem, the others regularly disposed around. The side branches may have been shortened, in which case a growth must be trained forward as leader from the extremity of each, and the others pinched, though the branches may be forked where desired to originate subsidiary branches; the pinched side shoots are cut back in winter to within a bud or two of their bases to form spurs. The side and subsidiary branches should not be nearer each other than 9 inches, and are better 1 foot apart; the lower side branches seldom require shortening, and the others only to preserve the symmetrical form of each specimen. At the third and fourth pruning three side shoots and a leader will be secured, and so on, until the tree is as large as desired.

formed. A large portion of the pears will fall naturally when quite small, and the cultivator should wait three weeks after this stage before he commences to thin. Late frosts will often destroy numbers also, so that it is not advisable to start thinning too early; leave the best-looking fruits which are placed in such positions as to derive the fullest benefit from sun and air. All imperfect fruits, those below the branches and (on wall trees) those touching the walls, should be removed. A very heavy crop will result in small fruits of inferior flavour and hard texture. Pears on walls, and heavily cropped trees in other positions, need mulching and watering in July and August, and well repay this attention, especially if large fruits for exhibition purposes are desired; medium-sized fruits are, however, better flavoured and more generally useful.

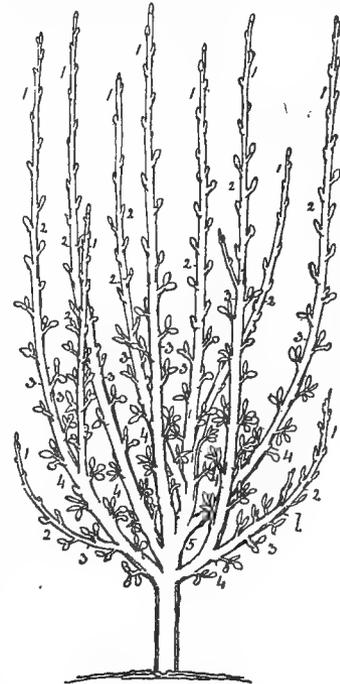
BEST STOCKS FOR PEARS.—Pyramidal, bush, cordon, or other forms of restricted growth, are best upon the Quince stock. Orchard trees and espaliers should be upon the Free or Pear stock. As the quince is a moisture-loving tree, where the soil is gravelly, sandy, or very light, the pear trees must be on the Pear stock; gross growth can always be checked by root-pruning. In planting pears grafted or budded on the Quince stock the junction of the scion should be placed 2 inches beneath the soil. But, on the other hand, care should be taken not to plant trees on the Free stock too deeply. Some varieties of the pear will not grow if worked direct on the Quince stock; in such cases nurserymen first graft or bud on the Quince a variety that is vigorous, and then upon this work the desired sort. This is termed "double grafting," and such trees produce a maximum of fruit with a minimum of growth.

MANURING PEAR TREES.—It is better to and duly thinned before giving stimulants, for if the trees fail to bear, too much growth results, and the proper balance between roots and branches is disturbed. The fruits upon trees of late sorts should be freely thinned and allowed to hang into November. Unless they are perfectly matured the fruits are harsh and woody, and never become fit for table use. These late sorts should be given warm positions, even south walls in cool districts.

ORCHARD CULTURE.—It is seldom that pains are taken to thin the crop of pears in orchards, but much finer fruits can be obtained where the boughs are kept well apart by severe pruning in winter, and a few hours given to thinning the fruits will be well repaid. If liquid manure or a mulch of long stable litter can be applied in June or July, and for the latest varieties until October, to those bearing a heavy crop the trees will benefit greatly.

In planting pears we do not advise manure to be used too freely as this may force the trees to make gross growth, and thus lead to the loss of spurs and fruit buds. Many buds may become blind, and the joints of some sorts will be too far apart to clothe the trees with fruit spurs, so we prefer rather to rely on good, sound loam. It frequently occurs that where much manure is used the soil becomes too loose for the trees to root readily, and those on the Quince stock especially will suffer in a dry season and become stunted. Established pear trees flower very freely, and are liable to exhaust themselves by the profusion of blossoms, so that no fruit "sets." In varieties that do this (generally those which make the least growth) it is advisable to go over the trees as soon as the buds are sufficiently forward and remove surplus clusters of flowers, *e.g.* those next to the wall, or where the clusters are so close to each other that it is evident all cannot come to perfection.

DESCRIPTIONS OF FRUIT.—It must be understood that there is a great



COLUMNAR PEAR TREE (5 YEARS OLD)

(1) Point of cutting back maiden tree (the numerals refer to the age of the wood). The result of this is six growths, disposed regularly around the stem, all others being removed. They may be arranged by means of wooden hoops,—an inner one 9 inches in diameter, and three uppermost shoots secured to it at 9 inches apart around the circumference; the outer hoop should be 15 inches in diameter, the three lower shoots arranged at equal distances around it, and alternating with the inner shoots. If the uppermost shoots grow more vigorously than the others, stop them not later than early in August when about 15 inches long, keeping the shoots as nearly on a level as possible. The winter pruning will be practically nil if summer stopping is practised, and the shoots are about on a level; otherwise shorten those too long, and cut close all laterals. The subsequent treatment is the same as for the bush and pyramid, the main branches are continued, and forked so as to have bearing branches 9 inches apart. Such tree has no central stem like the pyramid, and the form is peculiar to some varieties; it is well suited for plantations and gardens, especially when the cultivator cannot devote much time to the shaping of the trees.

difference both in the size and colour of pears, depending upon (1) the district where they are grown; (2) the position; (3) form of the tree; and (4) upon the amount of thinning. For example, fruits of Marie Louise gathered from standard trees may be almost entirely covered with russet, and but a quarter the size of fruits from wall trees, the latter being a bright orange when ripe, with only a suspicion of russet. Many pears in certain soils develop a crimson or red flush which is not met with generally. Pears are classed as gritty when the flesh is apple-like and hard round grits are found around the core; as melting when dissolving in the mouth like a peach, e.g. Doyenné du Comice; as crisp when mastication is needed. Some pears are apt to rot at the core. This may be prevented in a degree by gathering the fruits before they are fully ripe. The flavour of pears is variously described as sweet, rich, and perfumed; the meaning of each term is evident. Mid-season pears, as a rule, do not keep after they are ready for eating, more especially the September and October sorts, but their season can be lengthened by first gathering from the sunny side of pyramid trees or from the warmest parts of wall trees; as a rule all early pears are best flavoured and most juicy if gathered just before they are quite ripe.

There are some 500 varieties of this fruit known and catalogued, but for our purpose only 63 are figured and described, and these cover the whole season from the ripening of Doyenné d'Été in July to the last days of April.

ASPASIE AUCOURT.—*Skin* smooth, faint patches of russet; *colour* greenish, shading to yellow; *flesh* primrose, melting and juicy; *flavour* sweet and rich, first-class; *season* August; *growth* slow on the Quince stock, upon which it forms a fertile tree. Upon the Pear stock it grows moderately. It is one of the best pears in its season for garden use.

BARON LEROY.—*Skin* slightly rough; *colour* green, spotted with freckles of russet and brown, with bronze patches; *flesh* white, melting; *flavour* sweet, rich, and first-class; *season* December to January; *growth* moderate. This new pear resembles Bergamotte Esperen. It may supersede it, for Bergamotte Esperen is very captious. We consider it worthy of garden culture.

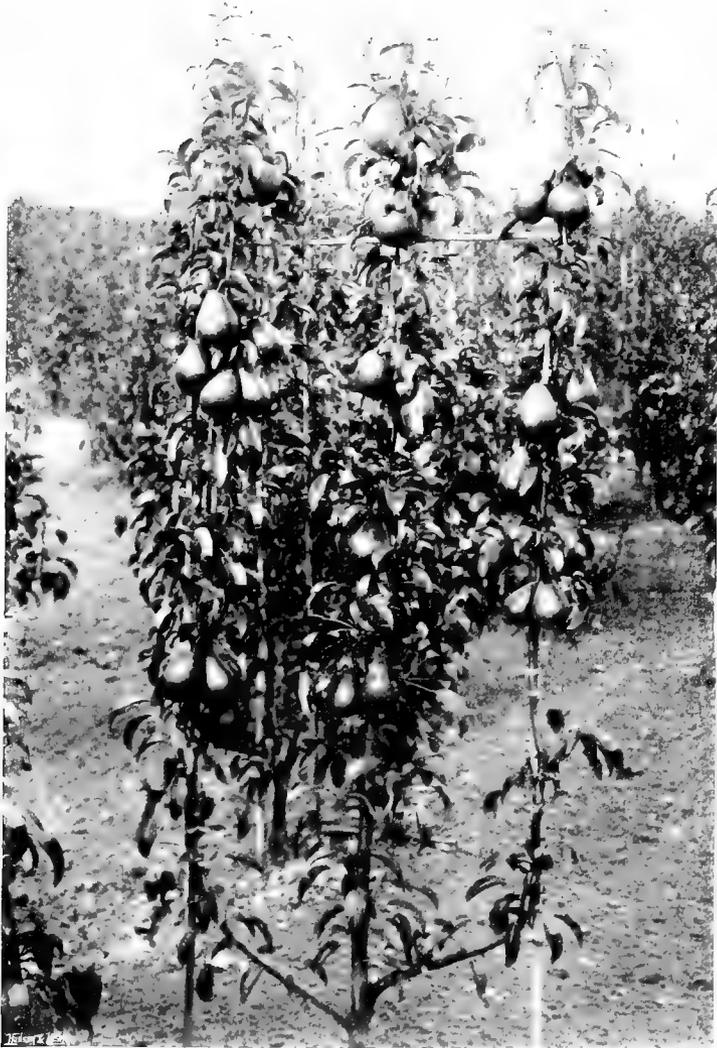
BEACON.—*Skin* smooth and shining, with faint russet; *colour* pale green, yellow, and with a brown cheek; *flesh* firm; *flavour* sweet, not first-rate, but passable for its season; *season* middle to end of July; *growth* very slow on the Quince stock, upon which it forms a fertile, compact tree. A free bearer.

BERGAMOTTE ESPEREN.—*Skin* smooth and shining; *colour* pale pea-green, covered with large russet dots and patches of russet, faintly red or rosy sometimes; *flesh* pale primrose, half-melting; *flavour* sweet and rich in a warm season, but in cold seasons only fit for stewing; *season* February to April; *growth* free and twiggy, an enormous cropper; prefers a heavy soil and wall culture, but on light land is seldom eatable.

BELLE JULIE.—*Skin* rough, covered with russet dots and patches; *colour* pale green to yellow; *flesh* nearly white, very juicy, melting; *flavour* rich, sweet, and quite first-class; *season* early November; *growth* close and compact; first-rate on Quince stock, and bears profusely; might succeed as a standard in warm positions; a very fine variety for garden culture in all forms. F.C.C. 1894.

BELLISSIME D'HIVER.—*Skin* smooth, with patches of rough russet; *colour* green and yellow, with a rich, bronzy cheek which, as the fruit ripens, is often scarlet; *flesh* white and crisp; *flavour*, a stewing pear; *season* November to March; *growth* compact, sturdy, upright, forming a great number of fruit-spurs; bears very freely, and, on account of its long season, is a valuable late cooking pear. Splendid when baked.

BEURRÉ BOSC.—*Skin* rough and harsh, entirely covered with rich, brown russet, with silvery dots; *flesh* firm, very juicy; *flavour* very rich and distinct; *season* October; *growth* spreading and moderate; forms a thin-branched orchard tree; not suitable for



TRIPLE UPRIGHT CORDON PEAR TREE.

cold soils; first-rate on walls or as a garden tree; requires double grafting on the Quince stock. Succeeds near the sea.

BEURRÉ D'AMANLIS.—*Skin* smooth, with russet patches; *colour* green, with black specks, and often with a reddish crimson cheek; *flesh* greenish white, half-melting; *flavour* refreshing and juicy, not very rich, and only fit for stewing in cool seasons; *season* September; *growth* spreading, succeeds in all forms, and is a very robust tree with large foliage. Though not first-class it is valuable, because it often fruits when pears are scarce.

BEURRÉ DE JONGHE.—*Skin* smooth, with thin russet; *colour* pale green to orange, with faint orange flush; *flesh* white, melting, juicy; *flavour* very rich, sweet; *season* January to March; *growth* very compact and full of fruit-spurs. Upright; forms a prolific tree on the Quince stock. It is free on the Pear, and one of the most useful garden fruits. F.C.C. 1875.

BEURRÉ DIEL (Beurré Magnifique, Jersey Beurré).—*Skin* slightly rough when from a wall, but frequently russety from open trees; *colour* green, with russet patches, changing to golden yellow when ripe; *flesh* crisp, white, granulous at the core, not melting; *flavour* very rich and unlike any other pear, very fine in good seasons, but in cold years only fit for stewing; *season* end of October and November; *growth* free. A variety that succeeds in warm soils, but the tree is apt to canker. The fruit is more or less gritty, so that, except in very good seasons, it is of little value. There are many better pears. Fine in Devon and Cornwall.

BEURRÉ DU BUISSON.—*Skin* harsh and uneven; *colour* pale greenish yellow, with a chocolate-red flush on one side; *flesh* greenish white, juicy; *flavour* very sweet and rich; *season* December to March; *growth* moderate and compact. A valuable garden pear, worthy of a wall or specially warm place, though it succeeds in the Midlands. F.C.C. 1894.

BEURRÉ FOUQUERAY.—*Skin* smooth and polished; *colour* pale pea-green, shading to yellow-green; *flesh* white, melting, very juicy; *flavour* almost first-rate, rich and refreshing; *season* October, over-ripe it is inferior; *growth* moderate, very freely set with spurs. A most prolific variety for garden culture, succeeding in all forms. F.C.C. 1895.

BEURRÉ GIFFARD.—*Skin* smooth and very thin; *colour* bright yellow, mottled with crimson, often scarlet; *flesh* snow white and crisp; *flavour* sweet, juicy, and refreshing; *season* August; *growth* peculiar; leaves small and placed widely apart; wood deep purple. It grows very irregularly, but bears freely, and is quite a first-rate garden fruit.

BEURRÉ HARDY.—*Skin* slightly rough; *colour* rich brown, shading to golden; *flesh* greenish white, melting, very juicy; *flavour* rich and refreshing; *season* October; *growth* robust. A grand grower, with large handsome foliage; forms a regular pyramid, and is good in any form. Bears moderately.

BEURRÉ JEAN VAN GEERT.—*Skin* smooth, with faint patches of russet; *colour* lemon, with a handsome red cheek; *flesh* white; *flavour* sweet, juicy, and pleasant; *season* October; *growth* neat and compact. Very free bearer; valuable for market sale. One of the most beautiful pears grown. Should be used before very ripe, or it loses quality.

BEURRÉ MORTILLET.—*Skin* slightly rough, often russety; *colour* pale yellow and green, with a brilliant brown-red cheek; *flesh* white, juicy; *flavour* refreshing, and often first-class; it requires to be gathered before it parts readily from the tree, as it soon rots when stored; *season* September; *growth* very sturdy, upright. A rather new pear of beautiful appearance. Often 1 lb. weight.

BEURRÉ PERRAN.—*Skin* almost covered with rough russet, less so on fruits from walls; *colour* rich brown; *flesh* juicy, whitish, crisp, but half-melting; *flavour* very rich; *season* February; *growth* upright and wiry; rather sparse of foliage. A very fine late pear that succeeds in all garden forms. In shape it is like Duchesse de Bordeaux. F.C.C. 1894.

BEURRÉ RANCE.—*Skin* rough and pitted; *colour* pale olive-green, strewn with russet and russet dots; *flesh* tender, melting, and juicy; *flavour* sweet and refreshing; *season* February to April; *growth* very free, fruit often very large. A most valuable late pear,

which prefers a warm wall. When upon the Pear stock it must be heavily root-pruned. Grows slowly as a cordon on the Quince. Not suitable as a standard.

BEURRÉ SUPERFIN.—*Skin* russety in places, smoother from a wall ; *colour* green to lemon, with patches of russet sometimes almost covering the fruit ; *flesh* nearly white, melting ; *flavour* first-class, very rich, like Marie Louise, but more piquant ; *season* end of October and November ; *growth* upright and compact. A grand garden pear, succeeding in all forms, and as a standard in warm soils.

CATILLAC (Pound Pear).—*Skin* harsh, often russety ; *colour* apple-green, with minute dots and flecks of russet, it often has a red or chocolate-red flush ; *flesh* firm, very crisp, and white ; *flavour*, when stewed, excellent ; it is not a dessert variety ; *season* November to May ; *growth* pendent, with very large roundish foliage. Makes a fine standard and a good garden tree on the Quince stock in all forms, but the growth is spreading for a bush.

CHARLES ERNEST.—*Skin* smooth ; *colour* bright primrose, with thin patches of russet ; *flesh* snow white, half-melting, juicy ; *flavour* sweet, rich, and refreshing, first-class ; *season* December to January ; *growth* compact and sturdy. This new pear resembles Souvenir du Congrès. One of the best of recently introduced pears. F.C.C. 1900.

CLAPP'S FAVOURITE.—*Skin* slightly harsh, very uneven ; *colour* bright yellow, with bronzy or sometimes bright red cheek ; *flesh* melting if gathered before fully ripe, but mealy when allowed to ripen on the tree ; *flavour* pleasant, but not first-class ; *season* September ; *growth* upright, with narrow foliage on long footstalks ; bears moderately. A valuable market pear on dwarf trees.

COLMAR D'ÉTÉ.—*Skin* slightly harsh, smooth on one side ; *colour* bright green, with pale yellow and bronzy red ; *flesh* crisp, half-melting ; *flavour* sweet, rich, and very pleasant ; *season* early September ; *growth* sturdy and upright, very full of fruit-spurs. A very free-bearing pear, which seldom fails to crop.

CONFERENCE (Rivers' Conference).—*Skin* slightly rough, with netted patches of russet ; *colour* pale green, shaded orange ; *flesh* tinged with pale orange, melting and juicy ; *flavour* rich, aromatic, and distinct ; *season* October ; *growth* upright and free, with plentiful foliage. A profuse bearer. Perhaps too large for orchard trees, but indispensable in gardens in any form. F.C.C. 1885.

CONSEILLER DE LA COUR (Maréchal de la Cour).—*Skin* rather harsh, sometimes russety ; *colour* pale bright green, with minute russet dots and splashes ; *flesh* greenish white, melting ; *flavour* very rich, with a peculiar musky flavour ; *season* November ; *growth* very free, with narrow foliage on long footstalks. A fine garden pear. Does well in cool soils, and is often 1 lb. in weight.

DIRECTEUR HARDY.—*Skin* smooth, with greenish dots and patches of russet ; *colour* pale lemon, rich bronzy red on one side ; *flesh* lemon-white, crisp and juicy ; *flavour* sweet and rich ; *season* October ; it keeps very well ; *growth* neat and compact. Although not one of the finest, it bears so well when other good pears are scarce that it merits culture, and is certainly an acquisition. A.M. 1896.

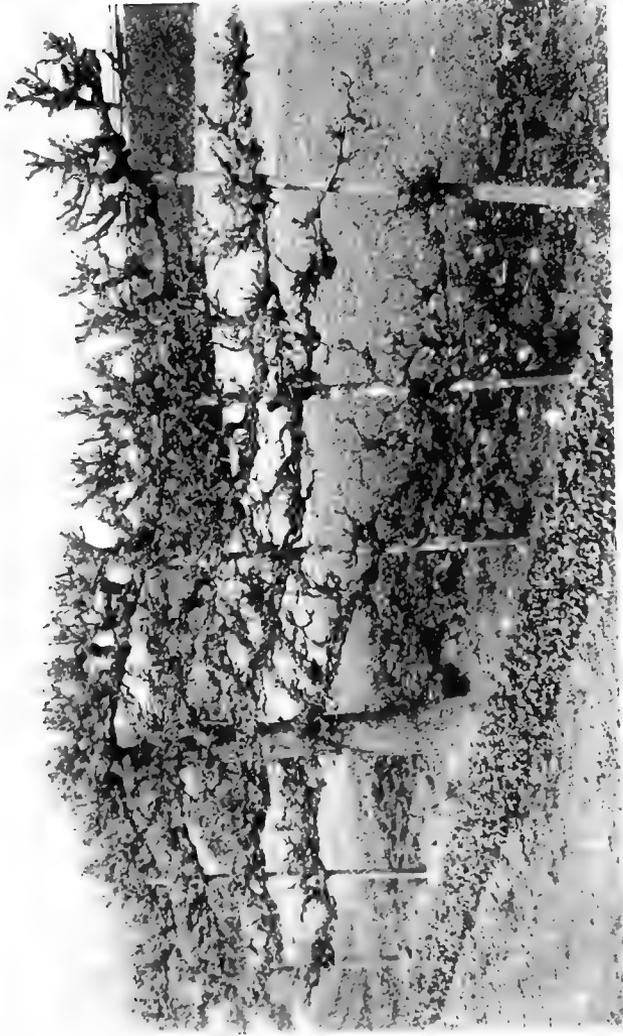
DOYENNÉ BOUSSOCH (Doyenné de Merode, Albertine).—*Skin* slightly rough ; *colour* bright orange with crimson flush and stripes, and large russety specks ; *flesh* white, crisp, half-melting, and juicy ; *flavour* brisk and refreshing, slightly acid ; *season* October ; *growth* moderate, spreading ; makes a good standard, and is very good in any form as a garden tree, though not first-class. Many like the briskly acid flavour ; it can be depended upon to bear when pears of better quality are scarce.

DOYENNÉ D'ALENÇON.—*Skin* smooth with faint russet ; *colour* pea-green, entirely covered with black dots, with thin patches of russet round both the eye and stalk, tinged with bronze on the sunny, primrose on the shaded side ; *flesh* pale creamy colour, half-melting ; *flavour* very rich and pleasant ; *season* January to March ; *growth* free on the Pear, compact on the Quince stock. A good bearer, and worthy of a wall. When the tree is fed the fruit becomes large and handsome. A.M. 1900.

DOYENNÉ D'ÉTÉ (Summer Doyenné).—*Skin* smooth and shining ; *colour* green, marbled yellow and primrose, with a bronzy or brilliant crimson cheek, with irregular



*PEAR TREE, UPRIGHT FORM OF TRAINING FOR
COVERING PILLAR.*



AN OLD ESPALIER PEAR TREE (GLOEU MORCEAU) AT CHISWICK.

patches of russet and golden dots ; *flesh* firm ; *flavour* rich, sweet, and pleasant ; if left on the tree to ripen it becomes mealy, but when gathered in time is juicy and good ; *season* middle to end of July, the earliest good pear ; *growth* upright, rather spreading ; forms a pretty pyramid or garden tree. Its earliness is its chief characteristic ; *foliage* thin and long.

DOYENNE DU COMICE (Comice).—*Skin* slightly harsh ; *colour* dull orange-yellow, with minute black dots, sometimes when from a wall has a brilliant red flush ; *flesh* melting, pale primrose, entirely without grit ; *flavour* exquisite, rich and delicious ; *season* November, and sometimes into December when from a cool wall ; *growth* moderate. This is without doubt the best pear grown, and should be freely planted in various aspects, on walls and in the open, to lengthen its season. Care should be taken to keep the roots near the surface by mulching, and if it grows too freely root-pruning must be carried out. It succeeds in any form. We do not advise heavy thinning, as the moderate-sized fruits have the richest flavour. F.C.C. 1900.

DR. JULES GUYOT.—*Skin* smooth and polished ; *colour* orange-yellow, with black dots ; *flesh* buttery and melting ; *flavour* perfumed and occasionally very good, but its chief value is as a market variety ; *season* September ; *growth* slow and sturdy. Bears profusely, and the fruit is often 1 lb. in weight. When gathered before fully ripe it is very juicy and good, but if over-ripe it is mealy and flavourless. This excellent fruit is being largely planted for market sale. The tree is very hardy and bears regularly. It succeeds in the north.

DUCHESSÉ DE BORDEAUX.—*Skin* smooth and velvety ; *colour* pale cinnamon-brown, streaked with patches of russet, with coppery tinge on sunny side ; *flesh* white and firm, half-melting ; *flavour* very rich, slightly aromatic ; *season* February to March ; *growth* moderate, free on the Pear stock, but slow on the Quince. A good bearer, and like many late pears pays for feeding at the root. Fruits must be well matured before being gathered. F.C.C. 1885.

DURONDEAU (De Tongrès).—*Skin* harsh, shining ; *colour* rich nut-brown with deep red-brown flush ; *flesh* white, half-melting, and juicy ; *flavour* very rich ; *season* end of October ; *growth* free ; *foliage* rather small. This indispensable pear succeeds in all forms, and is worthy of wall culture ; bears freely and regularly.

EASTER BEURRÉ.—*Skin* harsh when grown in the open, but often smooth in wall-grown fruits ; *colour* pale green with a chocolate-red cheek, with dots of the same colour, and faint silvery russet dots on shaded side ; *flesh* tender and melting, juicy ; *flavour* very refreshing, pleasantly sub-acid ; *season* December to March ; *growth* moderate, slow on the Quince stock ; worthy of a south or south-west wall, and is then first-class in beauty and flavour. Succeeds as a pyramid in good situations.

EMILE D'HEYST (Beurré d'Esteren).—*Skin* smooth ; *colour* orange-yellow with small russet dots and patches ; *flesh* yellowish, melting, and juicy ; *flavour* rich, piquant, with a pleasant refreshing acidity ; *season* end of October and November ; *growth* neat and compact, and somewhat irregular. It forms a mass of fruit-spurs, and bears profusely and regularly. It succeeds in many forms, and is a far more reliable sort than Marie Louise, though not so sweet and richly flavoured, but it has a pleasant sub-acid juice which many prefer. It is one of the best pears, and should be freely planted in various aspects. F.C.C. 1899.

FONDATE D'AUTOMNE.—*Skin* smooth with russet flecks and dots ; *colour* orange-yellow, with brownish red cheek, sometimes all greenish yellow ; *flesh* buttery, very juicy ; *flavour* very sweet and rich, first-class ; *season* end of September and October ; *growth* neat and compact with sparse small foliage. It succeeds in all forms, and is one of the very best grown. (Birds are particularly fond of it.)

FONDATE DE THIRRIOT.—*Skin* nearly smooth, with shallow punctures ; *colour* lemon to orange, often with a deep golden-scarlet tinge ; *flesh* firm, and very juicy ; *flavour* sweet, rich, and first-rate ; *season* October and November ; *growth* upright and free. A remarkable bearer, succeeding in any form, one of the best recently brought to notice ; *foliage* rather small.

GILOGIL.—*Skin* smooth and velvety ; *colour* rich coppery brown, strewn with thin

russet, shaded deeper brown; *flesh* white and crisp; *flavour* sweet and aromatic; *season* October to January, a stewing pear; *growth* very sturdy, bears freely, succeeds in all forms. It resembles Olivier de Serres. Almost apple-shaped.

GLOU MORCEAU.—*Skin* smooth, green from wall fruits, but from the open is often harsh with thick russet; *colour* dull olive-green, with some brown shadings, entirely covered with minute dots; *flesh* white, melting and juicy; *flavour* sweet, rich, and very refreshing; *season* November and December; *growth* moderate, with thick deep green shining foliage. This is first-class in warm seasons, or in the West of England, but the fruits are watery and insipid in cold seasons. It, however, bears freely, and succeeds by the sea, and in its season is valuable.

GROSSE CALEBASSE (Van Marum).—*Skin* harsh and russety with smooth patches; *colour* green changing to orange, but often entirely covered with russet; *flesh* white, crisp, juicy; *flavour* second-rate; *season* October and November; *growth* upright and sparse with long foliage. A stewing pear, and the largest grown. Although poor in quality is worth growing for exhibition, and for its handsome appearance.

JARGONELLE.—*Skin* smooth, often with rough russet markings; *colour* dark green shaded with yellow, with a chocolate or bronzy cheek; *flavour* sweet, perfumed; *flesh* whitish, melting, juicy, and refreshing, a fine old early pear; *season* August; *growth* spreading as a standard or garden tree. It requires much pruning to make a cordon or wall tree, but bears well upon the Quince stock. On the Free stock the trees require root-pruning, as they only fruit at the ends of the branches. Often much larger than the figure. Trees often live 200 years.

JOSEPHINE DE MALINES (Malines).—*Skin* smooth, netted with russet round the stalk and eye, thick and leathery; *colour* pale yellowish green, with spots and freckles of bright green; *flesh* melting, pale cream coloured, very juicy; *flavour* perfumed, rather richer from open trees than from those on a wall; *season* January to March; *growth* upright, moderate. Succeeds in all forms, and is one of the most regular bearing sorts we have. F.C.C. 1901.

KNIGHT'S MONARCH.—*Skin* smooth, polished, and sometimes patched with russet; *colour* green to yellow, with bronzy cheek; *flesh* leathery and crackling, pale golden yellow; *flavour* very rich, Bergamot-perfumed; *season* November to April; *growth* thin and wiry, produces fine large fruit on garden trees; that from standards is small, but of good quality. As the fruits fall before ready to gather, they should not be severely thinned. It varies much in shape from peg top to a blunt oval.

LE LECTIER.—*Skin* smooth and shining; *colour* dull green, covered with faint dots, slightly russet round the eye; *flesh* palest primrose, melting, juicy, and free from grit; *flavour* quite first-rate, sweet, and delicious; *season* January and February; *growth* free and vigorous, upright, with fine glossy foliage. F.C.C. 1894.

LOUISE BONNE OF JERSEY (Beurré d'Avranches).—*Skin* smooth and shining, sometimes with russet patches; *colour* pale green, with deep chocolate crimson—sometimes scarlet—flush; *flesh* white, crisp, and very juicy; *flavour* very sweet and refreshing, first-class; *season* October; *growth* moderate, upright, with narrow foliage. A very free bearer, succeeding in any form, and one of the handsomest sorts.

MARGUERITE MARILLAT.—*Skin* smooth, almost shining; *colour* pale orange with red flush, and irregular patches of russet; *flesh* palest primrose, melting and juicy; *flavour* rich; *season* early October; *growth* upright and vigorous. A grand garden pear, bears freely on the Quince stock, and is often 1 lb. in weight. Superb as a wall fruit on the Pear stock.

MARIE BENOIST.—*Skin*, when fruits are from a wall or orchard-house, bright pale green, netted and flecked with cinnamon-russet, but when from open trees often entirely covered with russet; *flesh* palest cream, half-melting; *flavour* rich and sweet; *season* December and January; *growth* slow on the Quince, moderate on the Pear stock. This varies very much in quality, but is often first-rate.

MARIE LOUISE.—*Skin*, smooth when from wall fruit, but when in the open often covered with russet patches; *colour* golden, or very rich nut-brown; *flesh* tender, melting, and very juicy; *flavour* extremely rich, quite first-class; *season* October and

November; *growth* very free and twiggy. Succeeds as a standard in good soils, but is best as open espalier or on a wall. Grows less freely on the Quince, and bears well every other year.

MARIE LOUISE D'UCCLE.—*Skin* smooth, with rough patches; *colour* orange and green, with russet spots and dots and an orange brown cheek; *flesh* white, crisp; *flavour* sweet, rich; *season* October; *growth* very robust, with deep green leaves. Though not first-class, it is so hardy that it frequently bears when pears are scarce; the fruit is very large and handsome.

MARQUIS (Rivers').—*Skin* slightly rough, with russet patches and dots; *colour* pale to bright green, bronzy on sunny side; *flesh* creamy brown, half melting and juicy; *flavour* rich and vinous; *season* Christmas; *growth* fair on the Quince stock. This new pair resembles Beurré Hardy and Easter Beurré, and has a large open eye, the stalk being inserted in a deep cavity; very promising.

MICHAELMAS NELIS.—*Skin* smooth; *colour* pale yellow with green dots, lemon on shaded side, russety near stalk; *flesh* white, buttery, and melting, no grit; *flavour* sweet and luscious, very rich and perfumed; *season* middle to end of September; *growth* vigorous. A seedling from Winter Nelis, which it resembles in form. Perhaps no pear in its season equals this, but it must be gathered before it parts readily from the tree, or, like many early sorts, it rots at the core. Grows freely on the Quince and Pear stocks. A.M. 1902.

NOUVELLE FULVIE.—*Skin* rough, very irregular; *colour* pale green, with russet spots and very minute dots, sometimes with a chocolate flush, and when grown on open trees, russety; *flesh* tender and melting; *flavour* first-class, rich and sweet; *season* February to March; *growth* moderate. Succeeds as a garden tree in the open, but is best from wall trees; bears moderately; shape very variable. F.C.C. 1900.

OLIVIER DE SERRES.—*Skin* rough, covered with nut-brown russet, with pale green patches showing through in places, slightly tinged with dull bronze on the sunny side; *flesh* dull golden, firm, half-melting, juicy; *flavour* very rich indeed, quite first-rate; *season* January to March; *growth* moderate, very knotty at joints, fine for cordons, pyramids, or garden trees in any form. Must remain on trees till November. A.M. 1900.

PASSE CRASSANE.—*Skin* smooth, but often rough from trees in the open; *colour* pale brown and green, but more often entirely covered with russet, especially round the stalk and eye; *flesh* melting, nearly white; *flavour* very rich, briskly acid, refreshing, first-class; *season* January and February; *growth* slow, on the Quince stock. When well grown this pear is grand, but it is very captious, and should be tried on walls in good pear soils only. F.C.C. 1898.

PETITE MARGUERITE.—*Skin* smooth, with faint russet; *colour* green, mottled yellow, bronzy on sunny side; *flesh* yellowish, half melting and juicy; *flavour* rich, sweet and pleasant; *season* September; *growth* free, succeeds in all forms; an enormous bearer, and a good variety for orchard culture.

PITMASTON DUCHESS.—*Skin* smooth, sometimes patched and striped with russet; *colour* pale green to yellow; *flesh* firm, half-melting and juicy; *flavour* in good seasons first-rate, but in cold years apt to be acid and poor; *season* October; *growth* very robust, with handsome foliage. Succeeds in all forms. A fine pear for bottling and stewing; fruits often weigh $1\frac{1}{2}$ lb. F.C.C. 1874.

PRESIDENT BARABE.—*Skin* russety, but in well-grown examples smoother; *colour* rich golden, and cinnamon; *flavour* first-class, extra fine quality; *flesh* milk-white, melting, and juicy; *season* March and later; *growth* moderate; a really grand fruit. It has not inaptly been termed a spring *Doyenné du Comice*, and is quite worthy of a wall. When well grown is large and delicious. F.C.C. 1901.

PRINCESS.—*Skin* smooth and shining, rarely russety; *colour* green and pale green with a brownish tinge, dark-green dots under the skin; *flesh* white, juicy, and melting; *flavour* briskly acid, very good; *season* October; *growth* compact, upright. A very free bearer, valuable for market culture, and one to be depended upon in poor seasons; fine as a cordon.

SAINTE LUKE (Rivers').—*Skin* rough, russety; *colour* deep cinnamon-brown with green patches; *flesh* melting, juicy; *flavour* rich and sweet; *season* October; *growth* moderate on the Quince stock. This, we believe, will prove a valuable variety.

SECKLE.—*Skin* slightly rough; *colour* mahogany-red with silvery dots; *flesh* white, crisp, and half-melting, juicy; *flavour* peculiar, rich, and aromatic; *season* October; *growth* neat and compact with narrow foliage on long footstalks. Many like the peculiar flavour and aroma of this little pear, but it is not always first-class.

SOUVENIR DU CONGRÈS.—*Skin* smooth, polished, knobby, and uneven; *colour* lemon with stripes and blotches of bright orange, scarlet, and red, and small russet dots over the whole surface; *flesh* white and firm; *flavour* musky, juicy, and pleasant; *season* end of September and October; *growth* on the Pear stock very free, requires to be double-grafted on the Quince, and then grows slowly, but bears freely, and often produces fruits $1\frac{1}{2}$ lb. in weight.

THOMPSON'S.—*Skin* fairly smooth, frequently knobbed; *colour* pale lemon yellow; *flesh* melting, very juicy; *flavour* sweet, perfumed, and delicious; *season* September and October; *growth* upright; *foliage* narrow and drooping. Succeeds as a standard and as a garden tree in all forms, but must be double grafted when on Quince stock.

TRIOMPHE DE VIENNE.—*Skin* rather harsh; *colour* pale orange, with russet spots and specks, russety near stalk; *flesh* crisp, melting; *flavour* brisk, and very sweet and rich, much better when gathered before it parts freely from the tree; *season* September and October; *growth* free and compact. A garden pear of great excellence, very handsome. If gathered early the flavour is very good, apt to rot at the core if left too long on the tree.

UVEDALE'S ST. GERMAIN (Spring Beurré, Pickering, Belle Angevine, Pound Pear).—*Skin* harsh; *colour* green and primrose, sometimes golden in hot seasons, with bright brick-red cheek covered with minute spots; *flesh* crisp and tough, greenish white; *flavour*, only used as a stewing pear; *season* November to May; *growth* very vigorous. Succeeds as a standard; fruits often are 2 lbs. in weight from wall trees; it is best upon a wall. It succeeds on the Quince or Pear stock.

VERULAM (Pound Pear, Black Jack, Warden).—*Skin* rough and harsh; *colour* cinnamon to bronzy red; *flesh* hard and gritty, crisp; *flavour* resembling that of Marie Louise; a useful stewing pear; *season* February, March; *growth* remarkably free, forms a large tree. On a cool wall the fruit will often be very large, and almost fit for dessert.

VICAR OF WINKFIELD (Bon Curé).—*Skin* smooth and shining; *colour* dull pea-green with a brownish or crimson flush; *flesh* white, crisp; *flavour* second-rate, valuable for stewing; *season* December; *growth* very free, pendent, with long-stalked leaves. It is a free bearer and very handsome, but more suitable for decoration or stewing than for dessert.

WILLIAMS' BON CHRÉTIEN (Bartlett, Williams').—*Skin* smooth, with patches of russet; *colour* yellow, often with a carmine flush, or when from open trees frequently russety; *flesh* melting, very juicy; *flavour* highly perfumed; *season* September; *growth* sturdy, upright, and compact. This well-known fruit succeeds in any form, but garden trees on the Quince stock produce the best fruits.

WINTER NÉLIS (Bonne de Malines).—*Skin* rough and russety from open trees, and nearly smooth when from a wall; *colour* pale yellowish green with patches of nut-brown; *flesh* melting, slightly gritty towards the core, cream coloured; *flavour* sweet, yet brisk; *season* November to March; *growth* thin and sparse, with small foliage on long footstalks. Can only be depended upon as a garden tree or on walls, which culture it well deserves. F.C.C. 1902.

ZÉPHIRIN GRÉGOIRE.—*Skin* smooth and polished; *colour* green, mottled with yellow; *flesh* white, melting, and juicy; *flavour* sweet and delicious; *season* December-January; *growth* thin, and spreading; *foliage* sparse. Forms a neat garden tree on the Quince stock. A fine sort for walls when grown on Pear stock.



TYPICAL PYRAMID PEAR TREES.



M. AR JOSAPHINE DL MALINES GRAFTED UPON BEURRÉ D'AMINLIS,
SHOWING FIRST SEASON'S GROWTH.

SELECTIONS OF DESSERT PEARS

FOR SMALL GARDENS

Petite Marguerite	September	Emile d'Heyst	November
Williams' Bon Chrétien	"	Beurré Superfin	"
Conference	October	Belle Julie	"
Louise Bonne	"	Fondante de Thirriot	"
Durondeau	November	Doyenné du Comice	Nov., Dec.
Pitmaston Duchess	"		

As amateurs do not often possess fruit stores, the later varieties are omitted; the most reliable of these are Josephine de Malines, Winter Nelis, and Duchesse de Bordeaux. The above are suitable for pyramids, cordons, and wall trees.

FOR GARDEN CULTURE

Jargonelle	July	Beurré Diel	Oct., Nov.
Souvenir du Congrès	September	Doyenné du Comice	Nov., Dec.
Williams' Bon Chrétien	"	Knight's Monarch	Nov., Feb.
Triomphe de Vienne	"	Winter Nelis	"
Fondante d'Automne	"	Charles Ernest	November
Marguerite Marillat	"	Beurré du Buisson	December
Michaelmas Nelis	End of Sept.	Beurré de Jonghe	Jan., Feb.
Conference	October	Easter Beurré	"
Louise Bonne of Jersey	"	Nouvelle Fulvie	"
Thompson's	"	Josephine de Malines	Dec., Feb.
Durondeau	Oct., Nov.	Olivier de Serres	Feb., March
Marie Louise	"	Beurré Perran	February
Emile d'Heyst	"	Beurré Rance	Feb., March
Beurré Superfin	"	Duchesse de Bordeaux	"
Beurré Hardy	"	Doyenné d'Alençon	"
Beurré Bosc	"	President Barabe	"

All the above are suitable for cordons, espaliers, or bushes.

FOR ORCHARD STANDARDS

CRAWFORD OR CHALK.—August. Fruit pale yellowish green, small and sweet; crops heavily and has short leafy upright growth; often planted as a protection to other trees on the windy sides of plantations.

LAMMAS.—August. A bright yellow and red fruit of second-rate flavour, but being early it sells well; growth free.

DR. JULES GUYOT.—See page 135.

WILLIAMS'.—See page 138.

HESSLE.—August-September. Small golden fruit with black specks; very free bearer; flavour sweet and pleasant; forms a weeping tree.

BEURRÉ DE CAPIAUMONT.—September-October. A medium-sized fruit, russety brown and orange-red; a very great bearer and upright grower.

BEURRÉ CLAIRGEAU.—October. A very large, handsome fruit with crimson flush; a free bearer, making close, upright trees on Quince stock, and large orchard trees on Pear stock. Its size and beauty render it valuable.

BEURRÉ BOSCO.—See page 132.

- BEURRÉ JEAN VAN GEERT.—See page 133.
 DOYENNÉ D'ÉTÉ.—See page 134.
 DOYENNÉ BOUSSOCH.—See page 134.
 DURONDEAU.—See page 135.
 EMILE D'HEYST.—See page 135.
 FERTILITY.—September. Growth free. Very prolific; fruit dull chocolate-brown, second-rate, but pays because of its fertility.
 JARGONELLE.—See page 136.
 PETITE MARGUERITE.—See page 137.
 PITMASTON DUCHESS.—See page 137.
 SUMMER CRASSANE (Aston Town).—Small greenish fruit with long stalk, very sweet and rich. Bears well when old; growth long and drooping.

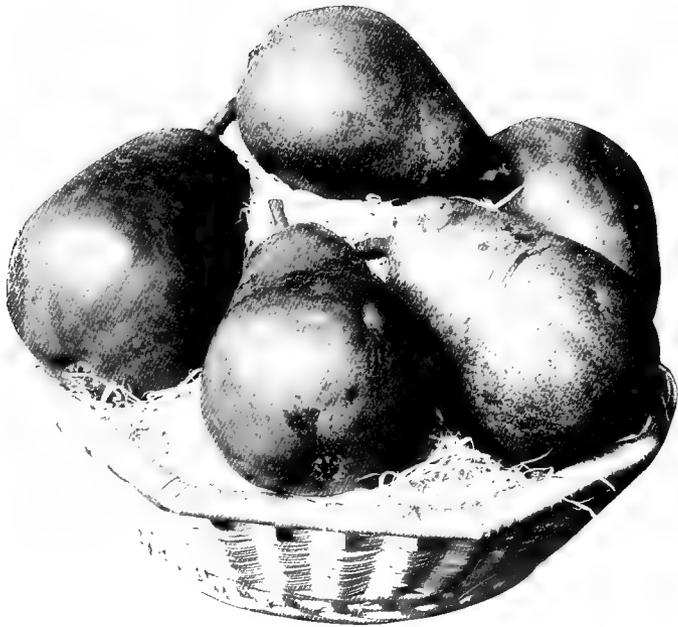
BEST MARKET PEARS AS BUSHES ON QUINCE STOCK

Beurré Hardy, Beurré Superfin, Conference, Doyenné du Comice, Fondante de Thirriot, Louise Bonne, Princess, Souvenir du Congrès, Petite Marguerite, Pitmaston Duchess, Emile d'Heyst, Durondeau, Doyenné Boussoch, Beurré Jean Van Geert, Beurré Clairgeau, Williams' Bon Chrétien, and Dr. Jules Guyot.

PEARS OF RECENT INTRODUCTION AND OTHERS

- BARON LEROY.—A November fruit of rich flavour, from the Continent. Resembles Chaumontel.
 BELLE GUERANDAISE.—A Continental November fruit of rich, sweet flavour. Is not fully ripe until the skin can be peeled off.
 COMTE DE LAMY.—This delicious fruit is omitted from the list because of its small size and awkward growth. October.
 DUCHESS D'ANGOULÊME.—Many may be surprised that this is omitted from the best, but although a free bearer, it is not above stewing quality, except in favourable situations.
 GLASTONBURY.—A fruit resembling Brown Beurré; first-class, but a shy bearer in places. October-November. F.C.C. R.H.S. Known as Benedictine, Beurré d'Avalon, and Porch's Beurré.
 GENERAL WAUCHOPE.—A useful new fruit, resembling Glou Morceau or Marie Louise in shape; of grand flavour for a February pear. A.M. R.H.S.
 LE BRUN.—A very long, bright green fruit, which ripens at the end of October and has the musky flavour of Williams' Bon Chrétien.
 PARROT.—A very richly-flavoured Bergamot-like fruit; ripe in October. A promising garden pear.
 ST. EDMUNDS.—One of Messrs. Rivers' new sorts; ripens in November. It is very sweet, and has a good aromatic flavour.

PERSIMMON, THE (see p. 208).



PEAR WILLIAMS' BON CHRÉTIEN.

CHAPTER XIII

THE PINEAPPLE

BY OWEN THOMAS

THE pineapple, so named from its resemblance to the cone of the pine, grows wild in abundance in many parts of Africa and South America, where it is indigenous, and where it affords a valuable source of food to the native population. The first pineapple in Europe is said to have been grown by M. le Cour of Leyden. The Earl of Portland was the means of introducing this plant into England from Holland in the year 1690.

Brookshaw relates that when the pineapple first produced fruit in England it was deemed to be so great a curiosity, and of so much importance, that persons of rank came from France, Holland, and Germany to see it. He concludes it must have been very rare, even had it in any instance produced fruits before the year 1716. Phillips, in his *Pomarium Britannicum*, says that "this fruit must have been known in England long before it was attempted to be grown here, as Lord Bacon mentions it in his Essay on Plantations, which was published nearly a century before the introduction of the pineapple by the Earl of Portland; but I am strongly persuaded that the fruit had been cultivated in this country at a much earlier period than that mentioned by Sloane, and this opinion has been strengthened by a curious old picture which the Earl of Waldegrave obligingly showed me in the breakfast-room of his beautiful residence, Strawberry Hall, Twickenham. The painting represents King Charles II. in a garden before his palace at Ham, attended by two of his favourite breeds of spaniels, where Rose, the royal gardener, is presenting his Majesty with the first pineapple." It is probable that the method of raising the pine not being understood, the plants were by some accident lost in this country until they were introduced a second time. The interest aroused on its first introduction and in its successful cultivation has been more or less maintained from that time until now. This was especially the case thirty or forty years ago when the art of successful pine culture was held in such high esteem. I well remember the great enthusiasm of those days in the culture of this fruit, and the tireless efforts put forth to excel in the same, and it is certain that finer pineapples than were grown in those days have never been seen in this country. Indeed I believe I am justified in saying that the art of pineapple culture has steadily declined from that time to the present, with very few notable exceptions. The cause of this is not far to seek, and is chiefly accounted for, not only by the increased number of pineapples imported into this country, but also by the great improvement in their quality as placed on the markets. There is, however, no comparison as regards

flavour and quality between say, a home-grown Queen Pine of 4 or 5 lbs. in weight and an imported fruit. The former one would be proud to place in the best and most select dessert, not so the latter.

PROPAGATION.—The propagation of the pineapple may be effected in four different ways, namely, by means of the crown of the fruit, by suckers, by the stem of the plant, and by seed.

The quickest and best method is by means of suckers; this is most generally practised. The suckers, *i.e.* the young plants which grow from the base of the stem of the parent plant, should be left upon the latter until they are of good size, say 18 inches long. The Queen Pine is prolific in bearing suckers, and the majority of these usually appear in spring; frequently one plant will produce five or six. As soon as they are large enough to handle, they should be reduced to one or two, according to the number required. It is better, for the plant's sake and for the suckers as well, that only one be left, as a stronger sucker will then result. The successful growth of the pine depends so much upon the careful treatment of the sucker that I may be excused for dwelling particularly on this point. Towards the beginning of May the surplus suckers must be removed. Some care is needed to do this without injuring the plant. The best way is to press down the sucker away from the stem and give it a twist, when it is easily detached. The one or two that are left, as the case may be, will then grow rapidly, and towards the end of August will have made strong and sturdy plants, from 18 inches to 2 feet long, and that is the best time to remove them for potting.

The next mode of propagation is by the crown (*i.e.* the leafy growth at the apex of the fruit). This takes much longer to make a plant and produce a fruit than the method we have just been considering, and is resorted to only in the case of varieties which produce few suckers. The only preparation necessary before the crown is ready for insertion in the pot is to take off a few of the bottom leaves, leaving about half an inch of the base bare; in time roots will be emitted from this if the crown is potted firmly into a 4-inch pot and plunged in a bottom heat of 70 degs.

The third method spoken of is to lay the hard part of the stem, after the leaves have been stripped off, in shallow pans or boxes partially filled with light loamy soil, covering them over to the depth of half an inch, and plunging them in a bottom heat of the temperature recommended above. This is a useful method to adopt when it is desired to increase the stock of choice and scarce varieties. It will be about three years before the young plants propagated in this way will give any return in fruit, and probably longer, but as one stem will often produce from five to six plants it is a useful method for increasing stock.

By seed.—When pine culture was so highly thought of and so generally practised in this country between thirty and forty years ago, many attempts were made to raise new varieties by cross-fertilising the older ones, and some few new sorts were obtained in this way. However, they were no improvement on older varieties, and for this reason soon disappeared. Seed-propagation in the case of the pine is only resorted to when it is hoped that an improved new variety may be produced.

VARIETIES.—I am afraid there is no great field for improvement in the varieties of the pine, those we already possess being so excellent. The best are the Queen, Smooth Cayenne, Charlotte Rothschild, and Black Jamaica. Others that used to be grown, but which are now almost forgotten, are: Providence, a huge variety, producing large coarse fruits of poor quality, often weighing as much as 16 lbs. each, and taking three years to grow; Sugarloaf, a handsome conical fruit of an intense crimson colour; Prince Albert, much like Sugarloaf, only a larger fruit and not quite so conical in shape; and Lady Beatrice Lambton. This variety was raised at Lambton Castle in 1860 by the then gardener, Mr. Stevens. It is a useful and handsome pineapple of excellent flavour, very distinct both in foliage and fruit; it will be a pity if it is lost to cultivation. Lord Carrington is another variety introduced by Mr. Miles many years ago. This was popular for a time, especially as a winter fruiting sort, but the varieties grown of late years in England are the three following: the Queen, Charlotte Rothschild, and Smooth Cayenne. There are three recognised forms of the Queen, viz., the Moscow, the Ripley, and the Thorsby. Ripley is the most handsome, as it is also the best and the most commonly grown. Thorsby is not unlike the Ripley, but the fruit is shorter and broader, and the plant rather more compact. The Moscow is a distinct and valuable pineapple, but now seldom met with. The plant is of dwarf habit and the fruit of great width, but short and of darker colour when ripe than the other Queen sorts. Two varieties are grown under the name of Charlotte Rothschild. The genuine one has large, dark, broad leaves; the spurious one has long, narrow ones. When at the Royal Gardens I had the pleasure of sending suckers of the true variety to some of our Government stations abroad through the Royal Gardens, Kew, and among them to a plantation in Jamaica, from some of which the superintendent assured me he had cut fruit weighing 16 lbs. There are also two varieties grown under the name of Smooth Cayenne. The true variety has dark, broad, leathery foliage, with here and there a prickle; the other, which is much inferior, has narrower leaves inclined to curl, is paler in colour, and has no prickles.

SOIL.—The best soil for the culture of the pine is fibrous loam; that cut from land resting on lime on a hillside may generally be depended upon. It should be cut in turves 4 inches deep and stacked for six months before being used. Some cultivators used to mix a quantity of peat with the soil, and this is still the custom in France; indeed, the late Mr. Bergman of Ferrières, who grew pines well, grew them chiefly in peat. I do not advocate the use of peat, however. The autumn is the best time to secure the turf, it is then comparatively dry. It will be in excellent condition for use the following February or March, the season for potting. When mixing the compost the turf should be pulled into pieces some 3 inches square and most of the small soil sifted away from it. To a barrow-load of loam add one peck of old mortar rubble broken small, and a 6-inch potful of soot, lime, and $\frac{1}{4}$ -inch bones. These several ingredients must be well mixed together. Prepare the compost at least a fortnight before it is wanted for potting.

PLANTS IN BORDERS.—The pineapple is cultivated in English gardens in two ways. One is termed the planting-out system, by which is understood that the plants are planted in a border; the other is pot culture. Both systems were extensively practised at the Royal Gardens, Windsor, and each had its advantages. By planting out you undoubtedly get larger and heavier fruits and also economise labour, and there is also an advantage in the long succession of fruits it is possible to obtain from one house by this method (especially when suckers of different sizes are planted out in the first instance). This way is better adapted to the culture of the larger varieties, such as the Rothschild and Cayenne pineapples. If plenty of leaves are to be had, no doubt this is the best way to provide the necessary bottom heat. The air of the house is constantly charged with ammonia by fermentation of the leaves, and with beech and oak leaves (which are best) this goes on for a long time. This method of culture was attended with much success at the Royal Gardens, and I think that I cannot do better than briefly outline the plan followed there.

THE STRUCTURE.—The structures in which the pineapples were planted out were big pits covered with portable lights like an ordinary frame. They were deep enough to hold at least 4 feet of leaves trampled firm; 10 feet wide to hold five rows of plants, and built in sections of from 30 to 40 feet long in order to accommodate successional crops planted at different times of the year. Two rows of 4-inch pipes should be provided (both back and front), on the top row of which troughs to hold water (for evaporation) should be fixed. The first house, or more correctly speaking, pit, should be planted as early in the autumn as it is possible to secure sufficient leaves to form a hot-bed, and after this has been made at least 4 feet deep and the soil added, the surface of the bed ought not to be less than $3\frac{1}{2}$ feet from the glass. A layer of turf, grass side downwards, is placed upon the leaves, and upon this again five ridges of soil. These ridges should be 10 inches high and made firm. If the leaves have been properly rammed and made firm when placed in the pit the bottom heat will not rise above 80 degs., which is not too high at the time of planting.

PLANTING.—The suckers may be planted 2 feet apart, allowing 2 feet between the ridges, as taken from the parent plant, rootless, in August; the only preparation necessary is to take off a few of the bottom leaves, leaving about an inch of the base bare, and cut off the end. The soil should be pressed firmly against the sucker at the time of planting. There will be very little more to do to the plants until the following spring; scarcely any shade will be required. A minimum night temperature of 65 degs. and a maximum of 75 degs. in the day with sun heat and 70 degs. without, should be maintained throughout the winter. The young plants will make roots, although making no appreciable foliage growth. On dry days until the middle of November they should be slightly syringed over once or twice a day. After this, until the end of January, the walls and pipes, but not the plants, may be syringed on dry days. If the soil was fairly moist at the time of planting, the plants will require no water at the roots before the first week in February (excepting an occasional syringing



A HOUSE OF THE QUEEN PINEAPPLE.

to keep the surface moist). Then a good soaking with tepid water may be given, and the temperature slightly raised.

GENERAL CULTURAL REMARKS.—The routine of culture during the following summer is very simple. Pineapple plants should always be kept rather dry. I mean by this that they must be allowed to become fairly dry before water is applied, but when watering does take place let the soil be thoroughly saturated; always use warm water. Syringe morning and afternoon, closing the pit early enough to raise the temperature from 75 to 85 degs. Early in May the plants will have made considerable growth, and more soil may be added to the border by filling it in firmly between the ridges. By the end of September the pit will be completely filled with splendid plants, the strongest of them most likely showing fruits (I have on one or two occasions cut a ripe fruit weighing 7 lbs. in seven months from planting a rootless sucker). As October approaches, lower the temperature somewhat, and keep the soil drier. When the pit was planted the suckers would be of various sizes, and this is an advantage which will now be apparent; some fruits will appear in the autumn, some in winter, and some in spring and early summer, according to the size of the suckers when planted. The largest plants should, of course, be placed in the back rows. Fruits appearing in spring are usually the finest, as they have all the summer in which to develop. The Rothschild pineapple not rarely bears fruits weighing 11 lbs., those 9 lbs. in weight are common. The Smooth Cayenne variety does not bear quite such heavy fruits, those weighing 10 lbs. are rare, those from 7 lbs. to 8 lbs. are common. When February comes round again the temperature should be slightly raised as in the previous year; water with manure water from the farmyard at a temperature of 80 degs. The bed will be full of healthy roots, therefore manure water should be applied in a diluted form at every watering. Keep the atmosphere moist by syringing, and increase the temperature slightly as the days become longer and warmer. Before the fruits are heavy, two stakes must be placed against each for support, otherwise the crown (*i.e.* the leaves on the top) becomes crooked, thus altogether spoiling the appearance of the pineapple; moreover, as the fruit increases in weight, it must be supported or it would fall. By the end of September all the fruits will be cut, and there ought to be a splendid lot of suckers on the old plants. The old soil will serve a most useful purpose in the potting shed or for forming borders in pits and frames for the growth of early vegetables. If leaves are scarce the same bed may be used again, mixing a few fresh ones with the old, although better results will follow if an entirely new bed is made. The information given will apply equally well to succeeding crops; when the pits are divided into two or three sections, and planted at intervals of three months, fruits can be had throughout the year. Before leaving the subject of planting out the pineapple, it may be of interest if I make a brief allusion to a method of pine cultivation known as Hamilton's system, in favour in England for a short time about thirty years ago; this is really the method adopted in those countries where the pineapple grows naturally out-of-doors. After the fruit is produced the suckers are not taken off, but encouraged to grow and bear fruit while still attached to the

parent plant. This system, so well adapted to its culture in tropical countries, was, as might be expected, found to be entirely unsuitable under artificial conditions such as prevail in British gardens, and so the method was soon discarded.

POT CULTURE.—I mentioned before that the planting-out system was better adapted for the successful culture of the larger varieties, such as Charlotte Rothschild and Smooth Cayenne, than for the Queen. I gave the Queen variety a good trial in this way, but the results were not such as to encourage me to continue to do so. The restricted root space of the pot evidently suited the requirements of the Queen variety better than did the border. I will now return to my reference to the treatment of the sucker when ready for potting in the month of May. Assuming that the soil was properly mixed some days previously, and the pots are ready, the first thing to do is to cover the crocks with the roughest part of the fibrous material of the potting soil, and upon this place the compost loosely until it is above the sides of the pot. Press the suckers into the soil about 3 inches below the pot rim, and afterwards make the soil quite firm by ramming. I have not recommended any organic manure to be mixed with the soil; no medium is better than fresh, fibrous soil. The suckers must next be plunged into the material of the propagating pit. A lean-to pit is suitable, and it should have a bed deep enough to hold from 4 to 5 feet of litter and leaves, with a bottom heat of at least 85 or 90 degs. at first. The atmospheric temperature in the day-time without sun-heat should be from 70 to 75 degs. The temperature of the manure and leaves in which the plants are plunged will gradually decrease as decomposition takes place, so that when roots have been emitted, say in three weeks' time, it will have cooled down to about 73 degs., and this is the heat to promote root action. I have found it an advantage to plunge the potted suckers closely together, allowing them to remain so for the first month or six weeks. In this way they are easily kept moist. If the soil is moderately moist when the suckers are potted, no water should be given for at least a fortnight. For the first fortnight heavy shade must be given, and the plants slightly syringed with tepid water several times during the day. On fine sunny afternoons close the pit early, after previously syringing. As the sun declines so will the heat of the pit, until the thermometer registers 70 degs., at which it should be kept during the night for the next two months, that is, until the end of October. At the end of a month after the sucker has been potted it will be found that roots have been freely produced, and I would advise that the plants be moved and replunged in the pit and in the same material, but considerably wider apart. It must be remembered that the young plants are now starting on their own account, as it were; previously they had existed on their parent. They must be given plenty of room through the subsequent stages of growth, as if crowded, it is hopeless and unreasonable to expect the best results. Heavy shade must be discontinued after the first three weeks, substituting shading of a lighter nature; by the middle of September it should be left off altogether. The treatment to be observed during the winter months is very simple. By the end of November the pots will have become full of healthy young roots,

and growth, both of foliage and roots, will have almost ceased temporarily. The plants consequently will be more or less at rest. A minimum temperature of 60 degs. and a maximum of 70 degs., according to the varying conditions of the weather, will be sufficiently high, and this applies to bottom as well as top heat. In very severe weather I would recommend that as a means of maintaining the necessary temperature a covering material of, for instance, mats or heavy tiffany be placed on the roof of the pit. The atmospheric temperature of the pit had far better fall considerably below the average recommended on an unusually cold night than that the pipes should be uncomfortably hot. There is nothing more detrimental to the pine—especially in winter, when it should be at rest—than an arid heat. Towards the end of February is the time for the suckers to be transferred to the pots in which they will bear fruit. The size of pot which I recommend is 11 inches in diameter at the top (inside). Needless to say, the pot must be scrupulously clean and also the crocks, and in the case of this final removal the drainage (pieces of broken pots), must be at least three-quarters of an inch deep. A very wet condition of the soil at any time in the culture of pines must be avoided if best results are desired; hence the necessity of careful and ample drainage. As regards soil for this final potting, the same is recommended as used for the planted-out pines. I do not advocate much manure being added to the soil for the culture of fruit trees in pots, and especially for the pine. Liquid manure can be given when the plants have finished flowering and the fruits commence to swell.

FINAL POTTING.—At the final potting the same care must be observed in mixing the soil as was the case in preparing it for the suckers, but little of the small soil should be used. Before the young pine plant is turned out of its pot it will be necessary to take away three or four of the small leaves at the base of the plant. The object is to induce the plant to form additional roots from the stem where the leaves have been taken off. When about to transfer the plant into its fruiting pot be sure that the roots are not dry. It is a fatal error to plant a dry mass of roots into new soil. Failure is sure to follow. The crocks, as in the case of the sucker pot, must first be covered with an inch of the rough pieces of soil well rammed down with the potting stick; afterwards as much soil placed upon this as will allow the surface soil of the plant to be embedded at least an inch deeper in the larger pot than it was before. New roots will then be produced from the base of the stem. Firm potting is essential to success in pine-growing. The pit to receive the newly potted plants is filled to the depth of 4 feet, with good leaves, oak, or beech for preference. No manure likely to ferment must be used; not a high, but a steady and lasting bottom heat is required. The leaves must be trodden as firmly as possible. When the bottom heat does not exceed 75 to 80 degs. the plants may be plunged in their permanent quarters.

SUMMER TREATMENT.—No water must be given for at least a fortnight; when the plants should have a good soaking, water them twice with water at the temperature of 80 degs. This should suffice for another fortnight at least. As new roots and fresh growth are made more water will be needed, especially as the days lengthen and the sun has greater power. The watering after this

period must be left to the good judgment of the cultivator, who should always bear in mind that the pine does not like much water either at the root or upon the foliage. The water used for watering or syringing must be as warm as the temperature of the house. During bright and sunny weather plenty of moisture in the atmosphere should be afforded by syringing the walls and surfaces of the beds morning and afternoon, and also by having troughs to hold water on the pipes. As the summer advances the plants will make rapid growth, and shading should be entirely discontinued. If by accident, or any other cause, the plants happen to be checked in growth, and are thereby weakened, shading becomes necessary for a time.

WINTER TREATMENT.—If all has gone well during the summer, by the month of October the plants will be fully grown, and should reward the grower with a crop of fine fruits early the following summer. Water at the roots must be sparingly given all through the winter. The soil, of course, must never be allowed to become quite dry. The plants are now fully developed, and all that is necessary to keep them in good health is to allow them to rest until the middle or end of the following February. Then will be the critical time in the life of the pine, as well as an anxious one for the cultivator. If the plant has been well grown, is fully developed, and has a pot full of healthy active roots, a close observer will soon find a thickening at the base of the plant, an expansion of the central leaves, and before many days are over, the crown of the embryo fruit will be visible.

FRUITING.—The temperature may then be slightly raised, as growth has again commenced, and the object must be to raise the temperature as much as possible by means of sun heat rather than by artificial heat. This will be made easier every week as the days lengthen and the sun gains more power. If the bottom heat has fallen much below 70 degs., it will be necessary to add fresh leaves as well as some fresh litter from the stable, well mixing them with the old leaves in the bed. This will give the extra bottom heat required, and will afford a gentle stimulus to the plants; the fruits will be ripe from the end of May to the end of July. Careful watch must be kept while the fruits are in flower against the depredations of cockroaches and crickets. These pests are very partial to the flowers of the pine, and if there should be any in the pit means must be taken to destroy them. This is best effected by pouring boiling water between the walls and the bed of leaves, for there they find lodgment in the day-time; if this remedy is persevered with daily for a week or so, complete immunity from these pests should be enjoyed. Some good poison paste should also be laid on the surface of the bed. It is very important to secure perfect fertilisation of the flowers, otherwise the fruits will be disfigured by some of the pips refusing to swell. Fertilisation generally takes place without artificial assistance. All the cultivator can do to help is to keep the atmosphere of the house rather dry, and not to syringe the plants. If danger is apprehended from insects, a little black pepper sprinkled on the flowers will protect them and will do the flowers no harm. I stated at the commencement of this chapter that little or no manure was necessary for the successful culture of the pine to a certain time. That time has now arrived. The first watering

the plant receives after the fruit is formed should consist of water in which a little guano has been mixed, and a safe proportion to use is a handful to three gallons of water. Although the plant will now take water much more freely care must be taken not to keep the soil always wet. I have found it is best to vary the stimulants given, thus: water once with guano water, then clear water, the next time with soot water, again with clear water, then with manure water from the stableyard, and with clear water, commencing again with guano. I have found it to be helpful to the development of the fruits to syringe them slightly two or three times a week on very hot days. I have now brought the reader within measurable distance of the goal aimed at, namely, the production of a good pineapple.

THE RIPE FRUIT.—As the period of ripeness approaches precaution is necessary against damage by crickets, &c. I have seen splendid fruits spoiled in a night by these; the best protection is a band of cotton-wool tied round the stem. In very hot weather, when the fruit has commenced to change colour, it is well to hang a piece of thin paper over it to prevent disfigurement by the sun. The fruit should be cut before it is quite ripe, and hung near the roof of a warm, airy house. When quite ripe it should be hung in a dry fruit-room until wanted for dessert or exhibition. In summer a pineapple will remain in good condition for about ten days after it is cut. In winter I have often kept fruits for three weeks. I will only add that the plants, after the fruits are cut, must remain where they are until the suckers, which have been previously reduced to one or two, as advised before, have grown into strong plants ready for potting in the month of August.

GENERAL NOTES.—The bottom heat I have recommended so far has been procured by means of fermenting materials only, and where these are available in sufficient quantities, one could wish for no better. True, more work is entailed in preparing the beds for plunging than would be the case if hot-water pipes were used; still it must not be forgotten that in addition to valuable bottom heat being provided (without the expense of fuel), an indispensable article in everyday use in the garden (leaf soil) is being gradually formed. Where leaves in plenty are not to be had, excellent pineapples can be grown by the substitution of hot-water pipes for the fermenting material. I do not advocate building hot-water tanks for atmospheric moisture, but pipes having troughs deep enough to hold a good quantity of water for evaporation. The pipes should be fixed underneath the bed, with a covering (forming the base of the bed) of slates or iron liberally perforated with holes, so that the heat can easily escape, and so give the necessary bottom heat. Four 4-inch pipes should be provided, supposing the border to be wide enough to hold five rows of plants; by having a valve on both the flow and return pipes, the heat can be regulated.

INSECT ENEMIES.—As regards these, I only know of two which give any trouble, viz. the white and brown scale (and sometimes mealy bug). To eradicate the white scale many remedies have been recommended by different authorities; but, speaking from an experience of nearly forty years, I would unhesitatingly say that there is no known remedy effective enough to rid the plants of these troublesome pests, and the only way in which immunity can be secured is by

destroying the plants and the insects together, and burning also the material in which they have been plunged, afterwards burning sulphur in the house three or four times in succession, having it whitewashed and painted and some other crop grown there during the next twelve months. By then it will be safe to start again with fresh plants. The best way to get rid of brown scale and mealy bug on pines is by the application of hot water, and apply this by means of a small piece of sponge tied to a stick; the insects are then easily reached.

TEMPERATURES FOR THE YEAR

WITHOUT SUN HEAT.

	<i>Maximum (by Day).</i>	<i>Minimum (by Night).</i>
January	from 68 to 70 degs.	From 60 to 65 degs.
February	„ 68 to 70 „	„ 60 to 65 „
March	„ 69 to 72 „	„ 62 to 66 „
April	„ 70 to 73 „	„ 64 to 67 „
May	„ 72 to 75 „	„ 65 to 68 „
June	„ 72 to 77 „	„ 66 to 69 „
July	„ 75 to 79 „	„ 68 to 70 „
August	„ 75 to 80 „	„ 68 to 71 „
September	„ 74 to 78 „	„ 66 to 68 „
October	„ 73 to 76 „	„ 64 to 66 „
November	„ 71 to 74 „	„ 63 to 65 „
December	„ 68 to 72 „	„ 60 to 63 „

[Bottom heat temperature: in winter, 65 to 70 degs.; in summer, 70 to 75 degs.]

When the house is closed in the afternoon, the temperature, influenced by the sun heat, may be allowed to rise considerably higher than the maximum given in the tables, especially from the end of April to the end of July, but it should never exceed 90 degs.

STANDARD BY WHICH TO JUDGE THE PINEAPPLE.—Perfect ripeness; each pip fully developed; poorly formed pips caused through imperfect fertilisation of the flowers to be considered a fault. The surface of the ripe pine should have a rich golden appearance, with a certain liquid exudation in places. The aroma should be rich and highly fragrant. A pale colour with pointed and poorly developed pips, a generally dried-up appearance of the fruit, are serious defects, and consequently lessen the value of the pine materially. A good Queen pine when ripe, especially in the height of summer, should weigh from 4 to 5 lbs. (they have been grown $7\frac{1}{2}$ or 8 lbs. in weight). Charlotte Rothschild from 7 to 9 lbs. is a good fruit; this may be had weighing from 10 to 12 lbs. The Smooth Cayenne will usually range from 1 to 2 lbs. less in weight. The crown, to be well proportioned, should be half the length of the fruit, and slightly tapering towards the apex. A crown very large or very small is considered a fault. The growth of the crown may be arrested, if it is desired to do so, by inserting a hot iron in the centre. In estimating the weight of a pine, a pound to a pip used to be considered a safe guide. It is so still in a well-developed, broad-set fruit, especially with Charlotte Rothschild and Smooth Cayenne, but very seldom so with the Queen.

CHAPTER XIV

THE PLUM

CULTURE ON WALLS

BY OWEN THOMAS

THE Wild Sloe and Bullace are indigenous to this country, and in all probability the only ones that are natives, but like the wild crab-apple they have furnished stocks for every variety of their own species; this fruit appears to have been attended to in early days, if we may judge from the variety that Gerarde had in his garden in Holborn in 1597. "I have," says he, "three score sorts in my garden, and all strange and rare; there be in many other places many more common, and yet cometh to our hands others not before known. The greatest varieties of these rare plums are to be found in the grounds of Master Richard Pointer of Twickenham." The damson or Damascene plum takes its name from Damascus, where it grows in great quantities, and whence it was brought into Italy about 114 years B.C. Speaking of the greengage the same authority says: "This latter plum was called the Reine Claude, from having been introduced into France by the Queen Claude, wife to Francis the First of that country, but it bears various names in different parts of France." It is often called "Damas Vert"; at Rouen, where it grows abundantly, they call it "La Verte Bonne." Lord Cromwell brought several sorts of plums from Italy into this country in the reign of Henry VII. Thus has the plum given pleasure and administered to the wants of man from time immemorial up to the present day.

Whether considered as a fruit for dessert, cooking, or preserving, the plum is of great importance and value. Most varieties in cultivation at the present time may be successfully grown in the orchard or in the open garden, and where the object is to grow the fruit for market these are the methods to adopt. But there are some varieties of the very highest merit that can only be successfully grown where the trees are planted against walls.

Few of our hardy fruits present less difficulties in their culture than the plum. Planted against a wall it will succeed equally well exposed to any aspect, and this is a valuable attribute, as the season of the best dessert varieties can be so much prolonged by planting trees on different aspects. For instance, take the many varieties of gages (and as long as we can secure these for dessert few lovers of the plum will wish for any other); by planting the old greengage, and, what is better still as regards richness of flavour and earliness, Denniston's Superb, on a south wall, ripe gages may be had in August, and if a few trees

are planted on east, west, and north walls, a continuous supply of delicious greengages may be had for many weeks in succession.

PLANTING.—With respect to the preparation of the border before the young trees are planted, it goes without saying that good drainage must be provided. As regards the soil which best suits the plum, the instructions given in the case of the cherry will apply equally to the plum, although soil of rather a lighter and warmer nature will give better results. In any case the border must be trenched at least $2\frac{1}{2}$ feet deep, and a little new loam and well-decayed manure mixed with the soil where the young tree is planted, adding a small quantity of lime at the time of trenching. I have found the best results accrue from a fan-trained tree, and this I would recommend in all cases. Fan-



PORTION OF BRANCH IN CHARACTERISTIC SUMMER GROWTH

- (a) Continuation of branch growth; (*p*) side shoots marked for pinching at third leaf when not required for training to furnish tree or space with bearing wood, and in winter to be shortened to one or two buds from main stem to form spurs; (*g*) short stubby shoots that need not be pinched; (*r*) spurs, short stubby shoots with the leaves close together about the apex; (*s*) fruit produced on the preceding year's wood; (*t*) fruit produced on spurs of the preceding summer's formation, with spurs at side for bearing the following year. Numerals refer to the age of wood. A terminal shoot (leafless) with spurs on sides is shown separately.

trained trees can be bought at much less cost than a private grower could prepare them. Do not plant too deeply; as a guide to the proper depth to place the tree, one will be safe in following the example of the nurseryman. How deep it was planted in the nursery will be plainly indicated on the stem of the tree by the soil mark, and this is the depth at which it should be planted again. As regards the distance apart the trees should be planted, the character of the variety must be taken into consideration as some are much stronger growers than others; as a guide to the inexperienced I may say that the strong-growing varieties are possessed of large leaves and the medium or smaller growers of small leaves. I do not advocate the planting of trained trees very far apart, for the reason that so much valuable wall space is left bare for a number of years, even when standard trees are planted between. I know that close planting is open to the objection that

when the trees meet, as they will do in the course of years, one must be sacrificed to make room for the other, that is, if unlimited extension is permitted to the tree which is intended to be the permanent one. I contend that far better returns of fruit are obtained during the early life of the tree by close planting. When the trees have met and the wall is entirely clothed with fruitful growth, I have found it of advantage, in the case of comparatively young trees, such as they would be at this stage, to arrest their extension for a few years by shortening the leading shoots. After three years, if it is decided to make room for the further extension of the permanent tree, it is an easy matter gradually to cut away the trees on either side as much as is required. By this



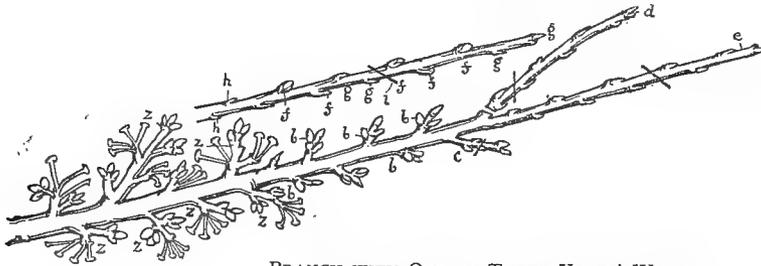
RESULT OF SHORTENING VIGOROUS SHOOT AT WINTER PRUNING TO SECURE SIDE GROWTHS FOR FORMING BRANCHES AT GIVEN POINTS

(*u*) Point of shortening at winter pruning; (*v*) natural spurs; (*w*) shoots pinched to form spurs; (*x*) side growths for forming branches to cover the space; (*y*) continuation shoot of main branch.

system the wall is covered with fruitful trees in about half the time it would take if trees were planted at great distances apart, as frequently recommended. It is scarcely necessary to say that the height of the wall must govern the distances apart at which trees are planted. Thus, for a wall 12 feet high the smaller growing plums should be 12 feet apart, the larger growing sorts 15 feet apart, with fan-trained standards between. On walls of less height the distance between the trees must be greater in proportion. The same careful attention will be necessary during the progress of the young plum tree as recommended in the case of the other fruit trees treated of, and especially with regard to gross growths when the trees are young. If these are not checked, nothing can save the tree from becoming barren in a few years' time. The three-year-old trained tree when received from the nursery will have probably six branches. The object of the cultivator the next year should be to

secure two more shoots on the upper sides of each of the existing branches, so as to build up the framework of the tree and cover the wall in as little time as possible. The result at the next winter's pruning should be the addition of twelve more branches to the tree. To preserve the symmetry of the tree restrict the shoots to the upper sides of the branches. Cases may occur where this is not practicable, then, rather than have the wall bare, I would train a shoot from the under side. The following year the main branches must be increased in the same way, and so on every year until the tree has filled its allotted space.

PRUNING.—Fruit-spurs will form on the main branches of the tree, and all the winter pruning necessary will be to shorten the shoots of the previous year's growth to within a few buds of their bases; fairly strong shoots should be cut to within four buds and weak shoots to two buds of their bases. If the



BRANCH WITH ONE TO THREE YEARS' WOOD

- (z) Spurs that have borne fruit in summer; (b) spurs of preceding summer's formation; (c) point of shortening a short stubby shoot; (d) side shoot at extremity of previous year's wood that may be left if desired to form a subsidiary branch at this point, or cut out—this being better than shortening to the cross line, as that induces vigorous shoots to push, and crowds with useless wood; (e) extension shoot left entire, or shortened at a wood bud (cross line) to originate growths for forming branches to cover the space. Shoot on side, one year old; (f) blossom buds; (g) wood buds; (h) basal buds; (i) point of shortening to originate growths.

fruit-spurs become long and unwieldy they must be shortened, and if the branches are overcrowded with fruit-spurs it is essential occasionally to cut away a few.

SUMMER PRUNING.—As a rule the plum does not require much disbudding. At the same time, if the wood-buds are too numerous, disbudding must be attended to, to prevent overcrowding. When the lateral shoots are about ten inches long, they should be shortened to half their length, and any resulting shoots stopped at the second leaf; no further attention will be necessary until the winter pruning, when these shoots must be pruned as previously advised. The same methods of pruning must be practised each year as the seasons come round, although as the trees advance in years it may be found necessary to train in some young shoots to fill vacant spaces; this can easily be done by reserving as many summer shoots as may be wanted, securing them to the wall the following winter.

PROTECTING TREES IN FLOWER.—The plum tree blossoms early, and as the

flowers are tender, more so perhaps than those of any other hardy fruit tree, they are liable to damage. For this reason there is an old saying that when a heavy crop of plums is secured, it generally follows that good crops of other hardy fruits are general the same year. The walls and their copings give some protection from frost, so much, that six or seven degrees will not hurt the blossom, but if a harder frost than this is anticipated protection should be given if possible; a herring net laid double thickness over the trees is best for the purpose.

THINNING THE FRUITS.—This is a practice not often resorted to in the case of the plum, but when there happens to be a heavy set of fruits judicious thinning is necessary, especially if fruits of the highest quality and size are desired.

THE RIPE FRUIT.—Do not be in a hurry to gather the fruit before it has had time to ripen. The gage plums, Coe's Golden Drop, and some other sorts, should not be gathered until they are quite ripe; they will then be found to be perfect sweetmeats, and equal in richness of flavour to any fruit grown. They should be handled with the greatest care. It will often be found that the stalks of the fruit adhere tenaciously to the tree. No attempt should be made to pull them off, but every fruit must be severed by a pair of scissors, retaining the stalk full length. It goes without saying that the trees must be carefully netted until the fruit is gathered as a protection from birds, and also from wasps, which are the worst enemies of the plum. The safest and best remedy is in spring to destroy the queen wasps, and later to destroy the nests. Also take the precaution of fixing some wide-necked bottles, containing beer and sugar, to the branches of the trees.

MULCHING.—I must again emphasise the importance of applying a mulch to plum trees, as recommended for other wall fruit trees, especially those planted in warm positions. Not only does the mulch prevent too rapid an evaporation of moisture from the soil, but it also affords rooting material for the multitude of those tiny thread-like roots that form during the summer, and which, after performing their functions in helping the trees to bear and mature heavy crops of fruit, may be cleared away with the mulch in the autumn. To some it may appear unusual and unwarrantable to recommend the destruction of these small annual roots, but the practice is a sound one, and the end justifies the means, for as good or better crops of these summer roots will result every succeeding year if the conditions are made favourable by applying rich surface dressings.

WATERING.—In considering the question of watering as regards wall trees generally, the fact must not be lost sight of that wall trees do not benefit by rain to the same extent as trees in the open quarter. The fact also must not be overlooked that the foundation of the wall itself is a means of facilitating the rapid passage of moisture to the subsoil or drains, therefore, if the best results are to be obtained, copious waterings must be given during the summer.

BEST PLUMS FOR WALL CULTURE.—The following are especially recommended for culture on walls, and most of them are distinct and first quality dessert plums. I have included a few distinguished by their large and noble

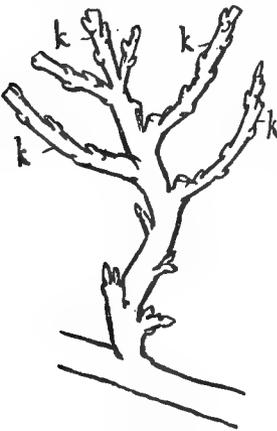
appearance, which strictly cannot be termed dessert varieties. These succeed as dwarfs, pyramids, and standards in the open ground, and so grown, are excellent for culinary purposes; but the improvement effected in size, quality, and flavour by wall cultivation is so great that their inclusion among the best dessert and exhibition plums is justified:—

Old Green Gage, Brahy's Green Gage, Brandy Gage, Bryanston Gage, Denniston's Superb Gage, Oullin's Golden Gage, Comte d'Atthem's Gage, Golden Transparent Gage, Transparent Gage, Reine Claude de Bavay, Transparent Late Gage, Coe's Golden Drop, Jefferson, Kirke's Blue, Reine Claude Violette, Washington. The following are, strictly speaking, culinary sorts, but when grown against a wall are good enough for dessert: *Archduke, Monarch, Prince Englebert, Prince of Wales, Pond's Seedling, White Magnum Bonum.*

THE PLUM FOR ORCHARDS AND PLANTATIONS

By GEORGE BUNYARD

The plum is generally grown upon standard trees. From these very fine fruit is produced, except in the northern counties. There they are best grown upon walls, then the fruit is not only large, but under the protection of the foliage takes on a beautiful bloom, and in that condition is considered perfect for dessert. Pyramid, bush, and cordon trees must be lifted and root-pruned every other year, or the growth becomes so gross that the spurs are unfruitful. They pay well for this treatment, but care should be taken that only half the trees are root-pruned at one time, so that in case of a dry spring the crop is not entirely lost. But when the trees have formed a mass of fibrous roots they do not suffer, especially if the root-pruning is done at the end of October before the leaves fall.



ELONGATED SPUR

(k) Pinched growths considerably extended; they must be shortened.

When standard trees bear a heavy crop, the fruits when three parts grown should be thinned; those removed can then be used for tarts. But on walls and garden trees the fruits should be thinned when they are smaller in order to give the best results.

The plum succeeds in nearly all soils, but a granite soil requires the addition of lime. In orchards standard trees should be planted some 15 to 20 feet apart; they soon come into bearing. They do well in cultivated land along with gooseberries, currants, or raspberries. When these bushes are worn out the land can be laid to grass, or kept open by cultivation as desired. The plum is a surface-rooting tree, and should never be planted deeply. It requires severe top-

pruning for some six years until the fruit-bearing shoots are strong enough to resist the wind. On young trees the crop of fruit should always be liberally thinned. The half-grown fruit can be used for tarts, and is sometimes worth marketing.

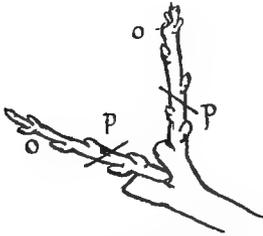
When planting for market, only a few varieties should be selected, the following being the most useful :—

EARLY (end of July and early August).—*Rivers' Prolific, Rivers' Czar, Early Orléans, Heron, Oullin's Golden Gage.*

MID-SEASON.—*Belle de Louvain, Jefferson's Gage, Victoria, Kent Diamond, Smith's Purple Prolific, Kent Bush Plum.*

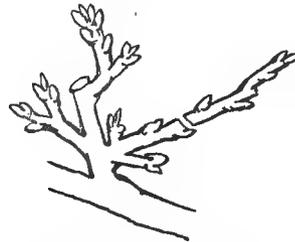
LATE.—*Pond's Seedling, Monarch, President.*

DAMSONS.—*Frogmore Prolific, Farleigh Prolific, King of Damsons, Shropshire Damson.*



RESULT OF SHORTENING A VIGOROUS SIDE SHOOT TO TWO BUDS AT THE PREVIOUS YEAR'S PRUNING

(o) Point of pinching growths in summer; (p) point of shortening at following winter's pruning.



RESULT OF SHORTENING AN ELONGATED SPUR

Spurs formed; shoot on left pinched at third leaf in summer, not counting basal leaves, and shortened in winter to two buds.

Plums are often grown as bushes and produce very fine fruit; the trees can be well pruned, thinned, and regulated without the use of a ladder. They are planted in rows 12 feet apart and 18 feet between each row. For garden use pyramids may be planted. These are very fertile when the roots are pruned every two or three years. But plums resent hard top-pruning without root attention, and then produce long whippy growths which cause the trees to be unfruitful; the more they are cut in the worse the trees become. They are also useful as cordons trained upon walls, and in the north of Britain are invaluable as pot trees for the orchard house. When trees are grown in pots some of them can be placed out-of-doors, and thus extend the season of ripe plums. There are many varieties, of which we give a selection sufficient for all purposes. Damsons, Bullaces, and Myrobelles require the same treatment.

Plums vary much in size, but not so much in colour, as do apples and pears. As to their size, much depends on the number of fruits allowed to ripen. The smaller fruits are best for jam, and the larger for tarts and bottling.

THE BEST PLUMS

BELGIAN PURPLE.—Deep crimson and purple, above medium size; *flesh* pale golden, firm; *skin* thick; *flavour* rich, almost fit for dessert; a very fine cooking plum which carries well to market, and is a great bearer; *fruit* not liable to crack. The tree is compact and sturdy and useful for all garden forms.

BELLE DE LOUVAIN.—Deep crimson, shaded blackish crimson; *suture* very shallow; *stone* very thin and flattened, long; *flesh* dull orange and red; *flavour* acid, but rich; an excellent bottling or cooking sort. F.C.C. 1855.

BRYANSTONE GAGE.—Pale green, with yellow and chocolate spots; rather larger than the greengage, and later; *flesh* greenish yellow; very sweet, firm, and rich. Tree vigorous, and a good bearer.

COE'S GOLDEN DROP (Golden Drop).—Bright orange to lemon, with reddish dots on the sunny side; *suture* very marked; *flesh* yellow, firm, juicy, sugary, and crisp. One of the richest flavoured plums, that will hang very late on wall trees. It is a valuable plum for all purposes, and where it succeeds as an orchard standard is very lucrative for market sale; of compact growth.

COMTE D'ATTHEM'S GAGE (Comte d'Atthem).—*Suture* wide and broad; *skin* very pale yellow, almost entirely covered with dull purplish red and golden dots; *flesh* very firm, pale golden colour. F.C.C.

DENNISTON'S SUPERB.—Apple-green marbled with dull yellow, changing to orange in fruits exposed to the sun; *suture* often deep and narrow; *skin* covered with whitish bloom; *flesh* greenish yellow; *flavour* very sweet and rich; when grown on a wall it is a sweetmeat; *stone* oval, even, and flattened. A valuable sort for all garden purposes.

DIAMOND (Black Mogul).—Deep black, shading to crimson; *flesh* bright golden, very firm, glutinous, and of brisk acid flavour, delicious for cooking; *stone* large and indented; *fruit* very large and fine when from a wall, and covered with a dense bloom; a cooking plum of the finest quality; tree strong and very twiggy, needing to be well thinned, bears every other year.

EARLY ORLÉANS (Wilmot's Early).—Deep red, with golden dots and speckles of russet; *flesh* firm; *stone* round; *flesh* greenish golden, of good flavour, but a cooking plum, valuable for its earliness. On light warm soils lucrative for market, but tender on heavy land.

EARLY TRANSPARENT GAGE (Early Apricot).—Canary, shading to primrose yellow, with brown spots; *flavour* very rich and sweet; *flesh* primrose colour, firm and juicy; a very free bearer. F.C.C. 1893.

GRAND DUKE.—Deep crimson purple, and when grown on a wall covered with bloom; *flesh* orange yellow, slightly acid. A valuable garden plum, but it blossoms very early, and is therefore liable to damage by frost; as an orchard tree Monarch and President are better. F.C.C. 1880.

GREEN GAGE.—When from wall trees or orchard house, *skin* brownish green and orange thickly covered with bloom. From open trees the fruit is often marked on the sunny side with russet patches, rosy red dots and splashes, and has no bloom. This rosy red spotting sometimes comes on wall fruits when they are exposed. *Flesh* firm, pale brownish green; *flavour* rich, sweet and luscious; *stone* nearly round, short.

GOLDEN TRANSPARENT.—Bright amber, with large red spots at the stalk end. *Suture* very faint; *flesh* golden amber, melting; *flavour* rich and sweet; *stone* small, flat; cling stone. F.C.C. 1893.

KIRKE'S.—Deep crimson violet marked with silver russet and gold. *Suture* shallow and narrow; *flesh* golden, with a tinge of green; cling stone; *flavour* very rich. The finest dessert purple plum for garden culture.

LATE ORANGE.—Deep golden yellow, very handsome. A new sort of great excellence keeping well into October. Tree vigorous, forming a fine pyramid. *Flavour* good for such a late fruit. F.C.C. 1892.

JEFFERSON (American Gage).—In form like Coe's Golden Drop. Bright yellow with green shading, and often very nearly covered with chocolate spots. *Flesh* primrose

colour, very rich and sweet, juicy. One of the very best for all purposes. Tree compact, and a good regular bearer. Succeeds in all forms.

LATE TRANSPARENT GAGE.—Pale yellow splashed with dull red, with large red spots near the stalk end. *Suture* very faint; *flesh* tender, melting, dull greenish yellow; *flavour* sweet and pleasant; *stone* small, thick and round; cling stone; carries a rich bloom. This plum is valuable at the end of the season. F.C.C. 1892.

MONARCH.—Roundish oval of medium size. Deep purple, almost black. *Flesh* pale primrose; *flavour* rich, and rather sweet. A late cooking variety of great excellence. Tree very strong, upright growth. It does not require much pruning when young. F.C.C. 1894.

OULLIN'S GOLDEN GAGE.—Rich primrose and yellow, egg-shaped, very handsome. A valuable early variety for dessert or cooking; makes a vigorous large spreading tree, and bears freely when old. Very fine for walls, or as garden trees.

POND'S SEEDLING (Fonthill, Red Egg).—Bright pink or dull red, with silvery and dark red spots and patches with tinges of brown. A very fine late sort which attains great size. *Flesh* gamboge yellow, very firm; *flavour* sweet, rich; *stone* oval, and small for the size of the fruit; cling stone. Requires pruning freely in a young state. A great bearer, and one of the most valuable for market sale at the close of the season. Tree very free, and of spreading growth.

PRESIDENT.—Violet black. *Suture* faintly marked; *flesh* bright pale yellow, firm; *flavour* pleasantly acid; free stone; *stone* same shape as fruit. A grand late kitchen sort, which cannot fail to become popular. F.C.C. 1900.

PRIMATE.—*Skin* entirely rich crimson-purple with silvery dots; *flesh* firm and golden; *flavour* briskly acid, very rich; a grand kitchen sort; *stone* large, broad, very rough; *growth* vigorous. A.M. 1898.

REINE CLAUDE DE BAVAY.—Dull pea-green, with greyish tinge. *Flesh* very firm; cling stone; of rich sugary flavour, as a late variety very useful; *growth* moderate, most suitable for garden tree.

RIVERS' EARLY PROLIFIC (Prolific, Early Rivers').—Crimson to purple when fully ripe. *Flesh* pale golden; free stone; when gathered from a wall fit for dessert. This is a most valuable early variety for market or home use, bearing very freely. *Growth* compact and drooping, rather twiggy, never makes a large tree.

SULTAN.—Almost round, with a wide suture on one side. *Colour* deep mulberry red, spotted with silvery russet, greenish yellow where shaded; *flesh* firm, greenish yellow; *flavour* rich; *stone* roundish oval, thick, with a deep furrow on side. F.C.C. 1873.

THE CZAR.—Deep purplish black, with white bloom when from a wall. *Flesh* pleasant, fit for dessert. A most valuable early sort for market or home use. Tree upright, and of very vigorous growth.

TRANSPARENT GAGE (Original).—Yellowish green, with orange patches and russet, spotted with deep gold and red; *flesh* crisp, juicy, and extremely rich. This variety is not figured; the stalk is deeply inserted, and the fruit resembles Early Transparent Gage in shape. *Growth* erratic; it is difficult to form a shapely tree, but its freedom in cropping and the exquisite flavour of the fruits render it desirable.

VICTORIA (Alderton, Dauphin, Royal Dauphin).—Pale pink, shaded with rosy pink, spotted with gold and silver; free stone; *flesh* orange yellow; when gathered from a wall fit for dessert. This valuable plum is one of the finest grown; the tree is a very free and regular bearer, in fact the fruits require thinning or the boughs are likely to break with the weight of fruit. Succeeds in any form, and is a great favourite for bottling, jam, or tarts, and lucrative for market.

WHITE MAGNUM BONUM (Magnum Bonum, White Egg).—Pale lemon-yellow, not shaded. *Flesh* whitish; free stone. When from a wall the fruits are most beautiful, covered with white bloom, keep late, and are often acceptable for dessert; as a cooking plum it is first-rate. Tree very vigorous, and a wonderful bearer. *Growth* upright.

WYEDALE.—*Fruit* deep crimson purple; cooks splendidly; *flesh* very gelatinous. Its chief value consists in its keeping well on the tree often until November. Tree moderate in growth, and when developed a regular bearer.

DAMSONS AND BULLACES

BLACK BULLACE.—Tree compact and twiggy ; *fruit* excellent when cooked. It may hang on the tree until November.

SHEPHERD'S BULLACE.—Tree of free growth ; *fruit* green and yellow, mottled with snowy patches. The latest and best variety. October.

DAMSON BRADLEY'S KING.—Tree spreading free growth, a profuse bearer ; *fruit* first-class in quality, and very sweet and rich. One of the best.

DAMSON CHESHIRE OR SHROPSHIRE (Michaelmas Damson, Prune Damson, Pruant Plum).—This is a large late variety ; one of the last to be gathered. Cooks well when fully ripe. The tree has large plum-like foliage, and is wide and spreading.

DAMSON FROGMORE PROLIFIC.—Tree of very free growth, forming a large and regular head ; *fruit* of large size, reddish black, very rich and sweet. Quite worthy of the dessert, and splendid when cooked.

DAMSON FARLEIGH PROLIFIC (Cluster Damson).—Tree compact, thorny, and an enormous bearer. The clusters of fruit are so crowded that they resemble bunches of black grapes. *Stone* rather large for the size of the fruit. Hardy.

PRUNE OF HEREFORD.—*Growth* upright ; *fruit* oval, pointed at both ends. Bears well in places, but does not find favour in the south.

WHITE DAMSON.—Tree upright and free-growing ; *fruit* oval ; orange-yellow shaded green or white. Rather larger than a black damson, and being in use in October is valuable for cooking purposes.

THE MYROBELLE (CHERRY PLUM).

In the desire for novelty which now obtains in all gardens this neglected fruit is often asked for. It is popularly called the cherry plum from its similarity in form to the cherry. It forms a close twiggy standard tree, and bears nearly every year ; but it is necessary that the wild stock (Myrobalan) be grafted with scions of a good variety, otherwise failure may ensue. It flourishes by the sea in the southern counties, but as it blossoms with the sloe or blackthorn, is not suitable for situations exposed to early frosts. It may, however, be grown in colder districts on walls as a trained tree, and is acceptable because the fruits ripen early in August ; although they do not attain to dessert excellence they are admirable for tarts and stewing. California and Japan have given us several varieties which we enumerate with remarks.

RED FRUITED.—Dull red pointed fruits.

YELLOW FRUITED.—Similar to the above except in colour, which is a bright canary yellow.

BURBANK.—A Californian variety ; *fruit* large and pointed, rich red with russet, and golden patches and dots. This new variety is a remarkable bearer ; as a pot plant for the orchard house it is beautiful in flower, and the fruit hangs in clusters of three to five, so that they must be well thinned. Very valuable for early tarts. The flavour reminds one of the apricot.

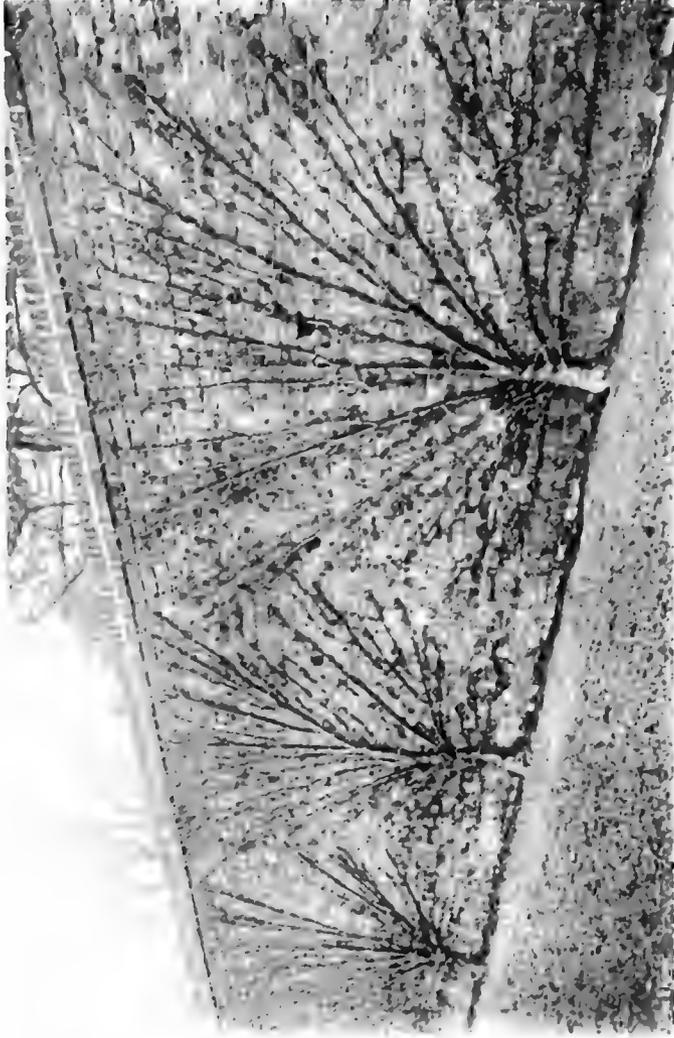
MASU.—*Fruit* nearly globular, bright red with golden dots ; *flavour* sweet and excellent. A Japanese variety.

BOTAN.—A very dark red Japanese variety, which bears freely.

PISSARDIL.—This is grown in gardens for its rich claret coloured foliage and early white flowers. We expect, however, as the trees age they will bear fruits ; these are the same colour as the foliage.



BULLACE "THE LANGLEY."



FAN-TRAINED WALL PLUM TREES.

Mr. Luther Burbank, of California, has introduced several hybrids, but at the time of writing we hesitate to recommend them, as the severe frost of February 1902 (32 degs.) has killed or crippled the young stock, and they may not prove hardy in Britain.

PLUM, THE DATE (see p. 208).

POMEGRANATE, THE (see p. 212).

THE QUINCE

This late autumn fruit is much appreciated for cooking and for preserving. The quince is a moisture-loving tree, and is at home by the side of ponds, in damp corners in gardens, &c. ; its beauty at flowering time is also remarkable. The culture of the quince is simple : merely thin out the shoots freely, prune back the long side growths to six buds, so as to make them bear fruits the whole length of the main branches. When the fruits are formed, liquid manure should be given to the trees ; the fruits will be greatly improved as a result. There are but three quinces usually grown :—

THE APPLE-SHAPED.—The tree bears well, is more twiggy than the others, and the fruit is rounder and ripens early.

THE PEAR-SHAPED.—This variety is the best for general culture. The tree bears well, and the fruit is of fine flavour.

THE PORTUGAL.—*Fruit* uneven and rugged, nearly covered with down, excellent, but does not ripen in cool seasons. The tree bears freely if well cultivated.

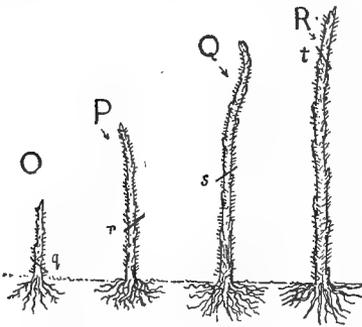
Several varieties of quinces are grown in America and on the Continent, but they do not differ materially from the above.

CHAPTER XV

THE RASPBERRY

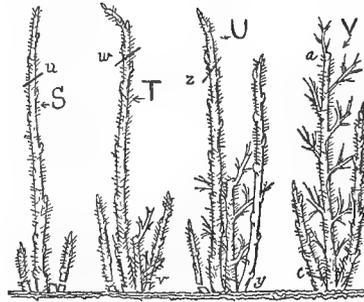
By GEORGE BUNYARD

It is important, in the first place, that the land for raspberry culture be deeply dug and well manured before the canes are planted, as owing to the surface-



SHORTENING RASPBERRY CANES AT PLANTING OR IN SPRING WHEN BUDS COMMENCE SWELLING

- o. A short, well-rooted cane; (*q*) point of shortening to ground. p. Small cane with fairly good fibrous roots; (*r*) point of pruning 6 to 12 inches from ground. q. Fruiting cane with abundance of roots; (*s*) point of shortening to 18 inches, or 2 feet from soil. r. Fruiting cane with good roots; (*t*) point of cutting off top of cane.



RESULTS OF SHORTENING CANES

- s. Result of cutting down a short (or weak, or badly rooted) cane (*o*); (*u*) point of shortening for bearing. t. Growths from a cane shortened to 6 to 12 inches from ground (*p*); (*w*) point of cutting away old cane at, or near, ground level; (*w*) point of shortening cane for bearing. u. Growths from a bearing cane shortened at 18 inches to 2 feet (*q*); the bottom cross line shows point of cutting away after fruit is gathered; (*y*) cane of previous year; (*z*) point of shortening cane of last summer for bearing. v. Result of leaving a long cane (*R*) in the first season; (*a*) fruited cane that must be cut to the ground; on the right is shown a weakly cane that must be shortened at least one-third of its length; (*c*) weak young cane that must be shortened to the ground, or near, indicated by cross line. Fruiting heavily the first year means very indifferent canes for fruiting the second season, thus losing a year or more.

rooting nature of the raspberry, it is unwise afterwards to dig the soil deeply. Any manure required can be added as a summer mulching, and be dug in during the winter, before Christmas. The raspberry prefers a somewhat damp

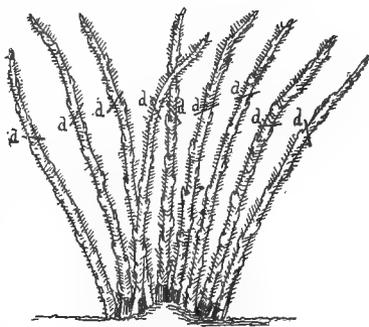
position, and well repays a good watering over the mulching of manure in the fruiting season. This will cause the berries to develop to full size, and also prolong the duration of the crop.

Plants should be grown in rows 6 feet apart, the canes being planted 2 feet apart in the row. The roots of the raspberry do not penetrate far, therefore the canes should not be deeply planted. After planting shorten the canes to $1\frac{1}{2}$ feet in length.

When established, several long shoots are produced by each plant. Three or four of the best of these should be selected, and the others pulled up or cut off, while the fruiting canes should be removed as soon as the fruit is gathered. The remaining canes will then ripen fully, and as winter approaches they should be tied together and supported, and pruned back to 4 feet. Some train the plants flatly on wires, and arch them over one another. This has a pretty effect, and the crop is readily gathered. In the winter the beds should be well manured, and the manure forked just beneath the surface of the ground. Deep digging disturbs the roots, and should be avoided. In dry soils a mulching of long stable manure in April is helpful to the crop.

The culture of the autumn-fruiting raspberries differs from that of the summer-fruiting varieties. The canes are cut to the ground in March, and as new growths appear the strongest are selected and allowed to grow freely, and the weaker ones are removed. Each cane must have plenty of room, otherwise the fruits may take mildew in the autumn. They are best in a group (not in rows), as canes are produced very freely, and the plants cannot easily be kept

to a straight line. The fruits are produced underneath the foliage at the top of the summer shoots, therefore the tops of the latter must not be cut off. Autumn raspberries are very useful either for dessert or cooking. It is sufficient to grow three varieties only.



NON-STAKING METHOD OF PRUNING

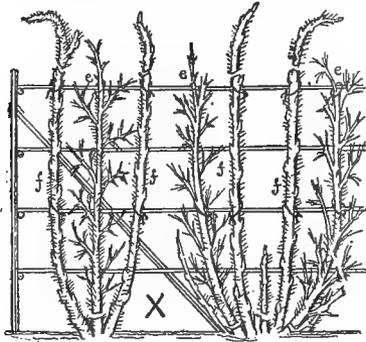
“Mound” of three years, planted in a triangle with plants three years old; (d) points of shortening canes to render them self-supporting. N.B.—When canes are short jointed and well matured, only the tips need be cut off.

RASPBERRIES IN AUTUMN

By J. C. TALLACK

Autumn raspberries when well grown form an important crop in a private garden, and are much appreciated for cooking, besides which they may, if the weather is really fine and warm when they are ripening, provide a welcome change in the dessert, and carry on the season of small fruits to the end of

October. It is not uncommon to find a few rows of these double bearers



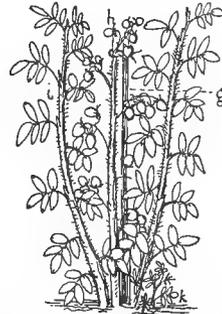
ESPALIER PRUNING

x. Established plants, showing—(e) fruited canes cut out in pruning; (f) successional bearing canes pruned back to well ripened wood, as the sappy and immature extremities cannot be relied upon to bear fine fruit.

(an unfortunate name, by-the-bye) growing with the summer sorts, and from them some late dishes are obtained; but the culture which requires two crops from the plants defeats the object for which they are grown, as the first crop, borne on last year's canes, strains their resources and prevents the second crop, borne on canes of the current year's growth, from being anything but an average one. Why it is left for raspberries to produce two crops while we are content with one of any other fruit is a mystery. The summer crop on the autumn bearers (such as Belle de Fontenay, the best and finest, and the red and yellow Four Seasons, which are both very prolific) is not necessary, as the regular summer bearers should then be providing quite sufficient.

My practice is to cut down the autumn fruited to the ground in February or March, and to thin out the new suckers which appear soon after sufficiently to allow them plenty of room. Any extra strong sucker which may appear well ahead of the rest should be cut away, as this in a cold season will continue growing without fruiting, and weaken the medium-sized growths. From about forty yards' run of canes I have picked, about the middle of October, 18 lbs. of as fine fruit as one could wish to see.

Autumn raspberries, like the summer varieties, enjoy liberal treatment, and the ground when being prepared should at least be deeply dug, and as the beds ought to last for many years some good manure from the stockyard, together with any bones, burnt rubbish, and anything that will tend permanently to enrich the soil should be dug in. October and November are the best months for planting, and the canes should be from suckers that have appeared at some distance from the old stools, as these are most likely to grow away freely. Each year a good mulching of manure is given in March or April, and in dry seasons on hot soils it may be necessary to give soakings of water, though in this respect the autumn bearers are more independent than others, as they have no old growth to support.



TRAINING TO UPRIGHT STAKE, AND REMOVING SURPLUS SUCKERS

Plant shown second season after planting; (g) stake (ash, Spanish chestnut, or larch is best) driven firmly into ground 18 inches or more, and about 4 feet above the soil; (h) last season's cane bearing fruit; (i) strong successional canes for fruiting the following season; (k) surplus suckers which should be pulled up when quite small.

THE BEST RASPBERRIES

BY GEORGE BUNYARD

RED VARIETIES

BAUMFORTH'S SEEDLING.—*Foliage* large and very uneven ; *fruit* crimson, of rich flavour, large and round.

CARTER'S PROLIFIC.—*Canes* arching ; *foliage* broad. The fruit slips readily from the stalk, and is sweet and very rich. A dwarf growing variety, and a good bearer.

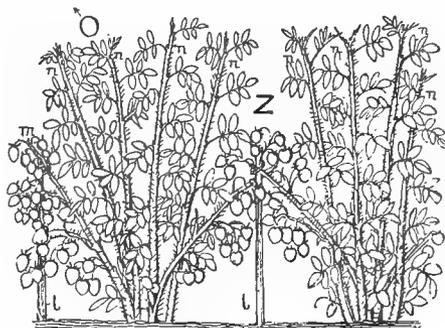
HORNET.—A large fruited variety, very similar to Norwich Wonder ; *growth* vigorous ; *fruit* dark red.

NORWICH WONDER.—*Foliage* wrinkled and marbled ; *canes* straight and firm ; *fruit* large, more bluntly pointed than in Superlative. A rich, deep red colour. A fine main crop variety. A favourite with market growers.

RED ANTWERP.—*Canes* rose colour, with dark spines ; *fruit* rather brisk in flavour, slipping easily from the stalk.

SEMPER FIDELIS.— *Foliage* small ; *canes* pale green, with black spines ; *leaves* pointed and pale green ; *fruit* thimble-shaped, small, but most freely produced ; being late it is doubly valuable. It is rich in colour, and makes the best preserve. *Growth* free. The canes must be well thinned to perfect the crop of fruit.

SUPERLATIVE.—*Foliage* deep green, very large and vigorous ; *canes* pale green, with black spines. This is by far the best red raspberry, it surpasses all others in size, fruitfulness, and vigour ; it also continues to bear for a long time. The *fruit* is very large, three often weigh an ounce. It has a brisk rich flavour, and is valuable alike for dessert or preserving. It is very firm, and can be sent to market in punnets. One of the most lucrative. F.C.C. 1888.



ARCHING THE FRUITING CANES

z. The system of arching ; (l) stakes 2½ to 3 feet above ground, and midway between plants in row ; (m) bearing canes ; (n) vigorous successional canes.

WHITE AND YELLOW

GROSSE BLANCHE (Large White).—A very free grower ; *fruit* amber colour. The plant bears for a long time.

THE GUINEA.—A robust yellow variety of Superlative. The foliage resembles this in form, but is greenish yellow. The *fruit* is very large and not so sweet as Yellow Antwerp, yet the vigorous growth and free bearing will commend this raspberry to all growers.

WHITE ANTWERP (Yellow Antwerp).—A very old and esteemed variety, of a bright yellow colour. Rich and sweet in flavour. The plant grows freely.

WHITE MAGNUM BONUM.—*Foliage* flat and pointed ; *canes* pale green, thickly covered with small prickles ; *fruit* of a primrose colour, round, pleasantly acid. Sweet and rich when thoroughly ripe. An early variety of dwarf habit that grows freely.

CROMWELL'S VICTORIA (Imperial Yellow).—Only valuable as an early sort, and soon over.

THE BEST AUTUMN-FRUITING RASPBERRIES

PERPETUAL DE BILLARD (Belle de Fontenay).—*Foliage* purplish red, flat, bold, and pointed. Belle de Fontenay is given as synonymous, as there is little or no difference between the two. F.C.C. 1865.

RED FOUR SEASONS.—*Leaves* very broad and large; not so good a raspberry as Belle de Fontenay; *canes* of moderate vigour.

YELLOW FOUR SEASONS.—The summer crop is early, and the fruits are of fine flavour. It bears profusely again from early August until the frost comes; *fruit* round, of a pale lemon colour; the early berries are very sweet, the later ones more acid; *growth* vigorous.



STRAWBERRY "LEADER" IN A MIDDLESEX GARDEN.

CHAPTER XVI

THE STRAWBERRY

STRAWBERRIES OUT-OF-DOORS

By GEORGE BUNYARD

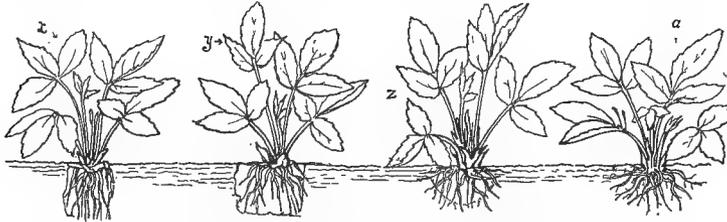
SIMPLE as are the necessary operations for their successful culture strawberries are often not well grown. The causes of failure usually are indifferent preparation of the soil, keeping the plants too long, growing second-rate varieties, and propagating from worn-out, unfertile plants. It is important in preparing the beds to move the soil 2 feet deep, and to work in some partly rotted manure. If this is not obtainable, then some artificial manure can be used; in either case the fertilisers should be well incorporated with the soil as the work proceeds.

The strawberry naturally prefers a deep, rich, loamy soil, and does not thrive on light, sandy, chalky, or gravel soils; by proper treatment, however, it can be well grown in any soil of sufficient depth and staple. Presuming that the soil to be dealt with is sandy, then cow-manure should be added, and with this may be given a sprinkling of salt and some nitrate of soda. On very poor sandy land it is best to make trenches, as for celery, 2 feet deep, then mix the above manures with the removed soil, adding some clay, and return the lot to the trench; make it firm by treading. Gravelly soils can be treated in the same way. For loamy soils, if light, use cow manure, and if heavy, horse manure, bone-dust, fish, or guano. For heavy clay soils use old hot-bed manure or manure from stables where horses are bedded on moss litter. The land being thus prepared and made firm by treading or rolling, mark out the rows 3 feet apart, and plant as early in August as possible, placing them 2 feet apart.

Plants in small pots are the best for planting. Should the weather prove dry and hot it will be advisable to place a flower-pot over each newly set plant, removing it in the evening and slightly sprinkling the leaves. It is absolutely necessary that the plants should be firmly placed, the roots well spread out, and the soil made firm. If the weather is dry, water freely after planting, and then mulch with a layer of long stable manure 3 inches thick. This will keep the surface moist, encourage an early growth, and prevent the raising of the plants by frost.

Strawberry plants can be planted with success up to March, but it is well not to plant during frosty weather and when the land is saturated with moisture. The work is best done as early as good plants can be had; and where these are provided in the planter's garden, showery weather should be taken advantage

of. Where the work cannot be done before November, strawberries may be planted as late as April; for even if they produce but little fruit, they form fine strong plants for the following year, and then produce double the crop obtained from plants one year old. Remove any side runners that may form. At the end of March remove the old litter in order to enable the planter to see if slugs, snails, or other pests are about, but if the plants are clear of these the litter may be replaced. If, however, they abound, the surface of the bed should be dressed with soot or lime to check them, and the soil hoed over to kill any weeds. A



CORRECT METHODS OF PLANTING ROOTED RUNNERS

(*x*) Plantlet or runner from a 3-inch pot; (*y*) first rooted in turf; (*z*) cut round with a trowel and lifted from the open ground with a ball of soil; (*a*) carefully lifted (though without soil).

fresh mulching of manure can then be placed on the beds; this will stimulate fresh growth and become perfectly clean before the fruit ripens. In the event of the old mulching being left on, some fresh clean straw should be laid round the plants to keep the fruits clean. In some gardens the strawberry plant makes a quantity of foliage, but bears little fruit. Under these circumstances the land is perhaps too full of humus, and an application of artificial manure will be an advantage, in conjunction with some well-slacked lime.

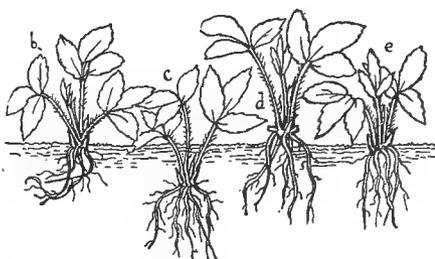
The strawberry is very fickle as to its wants, and a variety which succeeds in one place may fail in another, even under similar treatment. The favourite British Queen is a case in point; it prefers a chalky or heavy soil containing iron, while Vicomtesse H. de Thury prefers a light porous soil. There are others although failing totally in one county, yet are first-class in a neighbouring one. Where only large handsome fruits are desired the flowers may be thinned, removing the small and partially hidden ones. As soon as the fruits are gathered the mulching should be raked off, the side runners and old decaying foliage removed, the beds hoed over and kept free of weeds. No plantation of strawberries should be allowed to remain more than three years. One new bed made and one destroyed each year will insure a good supply of fruits. Where facilities exist some even prefer to have no beds more than one year old, and this may be advisable where a soil is quickly exhausted. But after many years of observation we recommend strawberry plantations to be left for two years, and for three years when small fruits for preserving purposes are required. In order to get a few very early strawberries, plant closely under a warm wall or upon an early border; a few plants should be put out 3 feet apart each way and have liberal treatment.

PROCURING RUNNERS.—When the plants come into blossom all the flower-trusses should be removed; this will force the plants to make early runners, which should be stopped after the first or second joint, and the plants either be layered into small pots or into turves to root; when ready to lift they should be transferred to well-prepared ground and be treated as previously described. They should have every encouragement, even the protection of tiffany if frosts are likely to affect the early blossoms in May. All the flower-trusses should be removed excepting the strongest one, and this should be allowed to carry six fruits only. When all the plants required are taken from the bed, remove the runners and keep the ground clean. The two-year-old plants will then produce a grand crop of fruits. Where space is limited panel beds may be made, and such beds being protected by foliage often return a good crop of second-sized fruits. When the beds are made 3 feet across the fruits can be secured without treading upon them. For producing fruits for preserving, plants from three to four years old may prove useful. The fruit for this purpose is best when firm. Large, soft, watery berries become too juicy when boiled.

Gardens are frequently surrounded by woods and parklands where birds abound, and it becomes necessary to net the beds before the fruit ripens to keep out the blackbirds and thrushes, which are often hard set for food. Care must be taken to peg the nets close to the ground, or the birds will be sure to find an entrance. Some amateurs may think the preparation of the ground for strawberries somewhat costly, but it must be borne in mind that for some years peas and other vegetable crops can follow the strawberries without extra manure, and after a rest or change of crop the land can again be used for strawberries.

LATE STRAWBERRIES are often as great a luxury as early ones, and where they are required suitable varieties should be selected from the list of late strawberries, and planted under the partial shade of a north wall or hedge; not being as a rule such strong growers as the earlier and mid-season sorts they may be planted 1 foot apart. We have tested some two hundred varieties, and those described are the best for all-round purposes. There are perhaps a hundred good and fair sorts, but for all practical purposes those named cannot be beaten, and many uncertain ones have been purposely left out. Some soft fruits, as Victoria, Louis Gauthier, and Goliath, which are of splendid quality, should, if possible, be gathered into the dish, as they are easily bruised or discoloured. Those to be sent long distances must be of a firmer texture and specially selected.

PERPETUAL FRUITING STRAWBERRIES (of recent introduction).—With these



INCORRECT METHODS OF PLANTING ROOTED RUNNERS

- (b) Plantlet with the roots doubled up in a shallow hole; (c) planted too deeply; (d) not planted deeply enough; (e) placed at proper depth but with the roots massed together.

there are great possibilities of development. The best way to secure fine autumnal strawberries is to go over the beds frequently, removing every decaying leaf and all the runners. The vigour of the plants is thus centred in producing a crop of fruits. Another method is to remove all the summer flower stalks and let the runners cover the soil, when a good crop of small berries will result. However, some special culture is necessary, because the weather in September and October is often damp and showery, and the fruits will rot unless some protection is afforded. Plenty of short litter will prevent fruits being spoiled by the soil splashing up during heavy rains.

STRAWBERRIES IN BARRELS.—The method of cultivating strawberries in barrels has advantages, and will prove interesting to that large class of amateurs who do not force strawberries or grow them in cold frames to procure a picking before they naturally ripen in the open beds. The plants we have seen were quite luxuriant, and the fruits ripened some ten or fourteen days in advance of those in the same gardens in the ordinary beds. This method of culture is to be recommended for insuring a very early dish, especially if the barrels are placed in a warm corner of the garden.

The holes in the casks ought not to be over 5 inches in diameter, and good soil should be used at the time of planting. In the centre of the tub or cask three 4-inch boards are fastened together, and have holes bored in them to prevent sourness of the soil, the apertures being closed with some hay or other material. Water given to the plants must be evenly distributed over the surface soil; superfluous water can escape at the bases of the casks where there should be six 1-inch holes. A cask will take about eighteen plants on the sides and six on the top, so that twenty-four plants can be grown in a space of 3 feet in diameter.

It is claimed for this style of culture that the fruit is very easily protected from birds, and that from its position it is more easily ripened and keeps perfectly clean. The same plants will probably last two years in a tub, but if fine large fruit is wanted it is best to plant annually, using good plants from 3-inch pots. In other respects they can be treated as pot plants for forcing. As regards the best sorts for this culture, we recommend the stronger growers, as Royal Sovereign, Sir Joseph Paxton, President, Vicomtesse H. de Thury, Auguste Nicaise, Louis Gauthier, &c. But if smaller growers such as Countess, British Queen, Dr. Hogg, &c., are planted, the holes need not be more than 3 inches across, while a trial can be made of late varieties, such as Waterloo, Elton Pine, Eleanor, Queen of Denmark, Frogmore Late Pine, &c., placing the tubs under the shade of a north wall.

Some difficulty has been experienced with the descriptions of the fruits. Typical ones have been chosen for illustration. But the first fruits are not only usually larger than those which follow, but they are often of a different shape. It is, however, hoped that the remarks as to foliage, habit, and any peculiarities in the variety may be of assistance. It must be remembered that fruit exhibited for prizes at shows is the very best the plants produce. Many consider, however, that the smaller strawberries possess the better flavour.



STRAWBERRY CULTURE IN BARREL.

STRAWBERRY CULTURE UNDER GLASS

By H. H. THOMAS

Although strawberries are not produced by artificial means to the same extent as they are grown out-of-doors in the Kentish fields, they are nevertheless grown in such numbers in glass-houses as to make their culture an important industry. Curiously enough, as the bulk of open-air strawberries are obtained from Kent, so also are those grown under glass, the neighbourhoods of Swanley, Bexley Heath, and other Kentish districts being chiefly responsible for the early market supplies. During spring the prices asked for good strawberries are very high, and taking into consideration the expense and labour involved in producing them at such an early season, this is not to be wondered at.

It will be well first to consider the most suitable structure in which to cultivate forced strawberry plants, and in doing so we shall find they will succeed in a variety of houses, providing these possess an efficient heating apparatus and are able to admit plenty of light. Those who grow supplies for market endeavour, of course, to conduct their work as economically as possible, and therefore prefer span-roofed houses because they are less expensive to build, and will hold more plants than lean-to structures. So that the plants may have all sunlight possible so early in the year, the span-roofed houses should run from north to south. One side will then receive the morning sun, the other side the afternoon sun, and the midday sun will benefit both sides of the house equally. The houses should be low, otherwise it will be necessary to erect wooden stages so as to bring the plants near the glass, and this would incur considerable extra expense and labour. The nearer the plants are to the glass within reason (they should not be closer than, say, 18 inches), the better will they flower and fruit. The height from the central pathway to the apex of the roof should be just sufficient to allow one to walk along comfortably. At the base of either slope the roof rests upon short brick walls about 2 feet high. The houses built by those who grow strawberries for market vary in length from 100 to 200 feet. They are 10 feet wide inside and 6 feet high to the apex of the roof. Along the centre of the house runs a pathway about 20 inches or 2 feet wide, and on either side of this are placed six rows of plants in 6-inch pots, a number that conveniently fills the two beds. The brick walls of the house are 18 inches above the level of the ground outside, and the pathway has therefore to be sunk in order to allow the workmen to pass along conveniently. Several houses are often built, as it were, in one. Supposing three houses to be built together, there would be three distinct span roofs, but only two solid walls, and these the two outside ones. The purpose of the inner walls is served by brick pillars built at intervals along where the wall would ordinarily be. While giving all necessary support, this system admits of a free circulation of air throughout the three houses, and the plants are almost as well off in this respect (if the houses are well ventilated) as if growing out-of-doors.

We see, then, that if houses are specially built for the cultivation of forced strawberries, low-spanned roofed ones are at once the most suitable and

economical. The fruits may, however, be produced in various other structures, and equally well also. Better fruits may perhaps be had from a lean-to house facing due south than from a span-roofed one, but for the reasons above given the latter would be preferred by a market grower. Heated pits and frames are particularly well adapted to the forcing of the strawberry, because one is able without difficulty to keep the plants close to the glass. They have one drawback in that it is necessary to remove the lights in order to give water to the plants. In cold and unfavourable weather this is a disadvantage. Thousands of strawberry plants are grown on shelves in vineries, peach-houses, melon houses, &c., and if they are well looked after in these positions very good results are obtained. Gardeners who endeavour to utilise to the utmost the valuable space in their glass-houses will not fail to have shelves placed along the front of the vineries, peach-houses, and melon-houses, and high up along the back of them also. Where special provision is made for forcing strawberries, they had better not be introduced to vineries and peach houses, &c., as they are frequently the cause of red spider on the trees. These shelves prove invaluable during winter and early spring in providing accommodation for strawberries in pots. The plants must be kept free from red spider, or this will spread to the permanent trees in the houses. Cold frames also are suitable positions for pot strawberries for a few weeks previous to the latter being placed in heat, but these matters will be more fully entered into in the remarks upon culture.

PROPAGATION.—The strawberry is most readily and conveniently propagated by means of runners, the name given to those numerous, stalk-like growths bearing tiny plants at intervals, which are produced by the parent plant. Propagation is effected by so treating these small plants as to cause them to form roots. The methods of doing this are various, but the one described at length below is that we have found to be the best in every way. It is of great importance that layering (the technical term given to the work of placing the runners in soil) should be done early, so that strong and well-rooted plants may be formed by the autumn. This is essential to the successful forcing of the strawberry. Late-rooted runners cannot possibly produce such good plants, for when they should be making rapid progress they are simply commencing to form roots, with the result that by the time they are in a position to grow, practically all the conditions that conduce to healthy, rapid, and vigorous growth are over. And it is hopeless to expect such plants to withstand the unfavourable conditions that forced strawberries are subjected to. The earlier satisfactory runners are obtained and rooted the earlier will one be able to establish them in the pots in which they are to bear fruit, and the greater therefore will be the chances of ultimate success. We say satisfactory runners advisedly, for the very earliest are not always the best.

PREPARATION FOR LAYERING.—The subject of layering the runners is such an important item of strawberry culture that no apology is needed for referring to it at some length. The first thing to consider is the preparation of the soil with which to fill the small pots wherein the runners are to be layered. It is obvious that the compost in which the small plants are to establish themselves must be such that the young and delicate roots may easily enter—in other

words, it must consist of fine particles of soil, such as that passed through a small-meshed sieve; it must be entirely free from hard lumps, stones, or anything likely to impede the progress of the tiny rootlets. We have found nothing more suitable than good loam. Preparing the soil and filling the small pots should be commenced early, so that when the runners are ready for layering there need be no delay occasioned by having to wait for pots. One should

know beforehand approximately how many plants will be required, and as many small pots filled with the prepared compost should be made ready. It is advisable to keep the small pots (when they are filled) somewhere in the shade; if placed where the sun can reach them the soil becomes dry and hard, and needs soaking with water to moisten it thoroughly again. No less

important than keeping the prepared pots in the shade, is the necessity for placing them where they are sheltered from the rain, otherwise the soil, if the weather is at all wet, will become sodden and totally unsuitable as a rooting medium for the young strawberry plants. We have always made use of a shed that faces north for the preparation of the soil and filling the pots, then stacking them upon each other until required. When the runners are ready, it is an easy matter to take them to the strawberry ground in a wheelbarrow.

Before commencing to insert the runners in the small pots, there are several minor details whose observance will greatly tend to convenience of working, and also, to some extent, will affect the future welfare and progress of the plants. In the first place, the worker should so dispose the pots as to leave the path between every other row entirely clear, so that one may pass along without fear of doing any damage to the plants. This is of importance, because when the runners are well rooted and growing strongly, they take a surprising amount of water. It is not wise to layer a larger number of runners from any one plant than is necessary to make up the quantity required. The object should be to have the runners distributed as evenly as possible throughout the plantation; much then will have been achieved towards obtaining plants of regular and satisfactory growth. For instance, if two thousand young strawberry plants are required, and there are, say, four hundred old plants from which to obtain them, select about five runners from each. It is obviously unwise to take a larger number from one plant than is necessary, for they must suffer to a certain extent, and in fact, they do, for "blind" ones are likely to be more numerous if too many are selected from one parent plant. It will be noticed that upon each stalk-like growth several of these tiny plants are produced, and here again a word of caution is necessary. If sufficient plants can thus be



A "RUNNER" BEARING PLANTLETS OF VARYING SIZES

- (o) First runners of layering size; (p) second runners, not desirable unless runners are scarce; (q) third runner; (r) runner stem extending; (s) point of cutting off runner stem.

obtained, take only one from each stalk, and that nearest to the parent-plant will usually be found to be the best. When two or more plantlets originating from the same stalk are layered, the first invariably takes the lead, much to the detriment of the others. In any but exceptionally bad seasons it is rarely that enough runners will not be obtained by going over all the plants, selecting an even number from each, and not more than one from the same stalk.

"BLIND" RUNNERS.—But even more important than any of the foregoing precautions, is the necessity for discarding any "blind" runners there may be, and layering only those which are good and sound. A runner is technically known as "blind" when its centre (whence, of course, emanate the young leaves, and eventually the flowers and fruit) has become abortive, and growth apparently has practically ceased. A "blind" runner can easily be recognised, for the centre of the tiny plant, if felt, will be found to be empty—to contain no embryo leaves. To insert many "blind" runners in the pots will mean, besides the expenditure of much fruitless labour, a very serious loss to the cultivator, for none of them will produce flowers, and therefore, no fruit. If many of these abortive plants have escaped the notice of the grower during the work of layering, the number of plants at his disposal for forcing will be considerably diminished. It will be seen, therefore, that the greatest care should be exercised in selecting the runners for layering. A certain number of "blind" runners will always be layered, but that cannot be helped, for some few may become "blind" after layering, or may have been passed as sound when they were really otherwise.

Having selected a sufficient number of runners from each plant, a corresponding number of small pots should be placed around the plant where the runners may be most conveniently layered into them, bearing in mind the necessity, as above explained, of keeping every alternate pathway open to allow of watering being done without difficulty. The pots should be plunged in the ground, so that the roots are kept cool and not exposed to the fierce sun heat. The labour of watering is much diminished by taking the precaution to plunge the pots, and the benefit to the plants themselves is also considerable, for the soil is thereby kept cool and moist, and remains more suitable as a rooting medium than if it were baked hard and dry by exposure to the sun.

LAYERING.—Such are some of the most important preliminary items to be borne in mind when proceeding to layer strawberries; having disposed of them we may say a few words with reference to the actual operation. By layering the runner is indicated its insertion in the pot of soil that it may become well rooted, and eventually firmly established there, and there are various methods of accomplishing this object. That found by us to be the one most worthy of recommendation, and one we have practised very largely, is the following. Having plunged the pot in the ground, take a piece of raffia, or a shred pulled from an old mat, or a cloth shred (such as is used to attach the shoots of fruits trees growing against walls) about 3 or 3½ inches long, double it around the stalk of the runner close to the plant, and then with a small pointed stick press the shred into the soil of the pot so deeply that the

plant itself is brought down to the soil, and indeed partly covered by it. It should be so low that while its base is covered the heart or centre of the plant is not. In inserting the runner another important point to bear in mind is that of making the plant firm. Indeed throughout the culture of the strawberry this must be practised if a successful issue is to result. Satisfactory crops of strawberries were never yet obtained from plants not made firm in the soil, no matter at what stage of their development, whether as runners in small pots, or as established plants in fruiting pots. If the runner is placed as deeply as mentioned above, and the shred is made secure in the soil, there will be little danger of the plant not being firm. Supposing sufficient plants to be obtained by layering one only from each stalk selected, the remaining ones



THREE METHODS OF LAYERING STRAWBERRIES

- (*t*) One-year-old plant in fruit, which is the best to take runners from, for although unfruitful plants produce the most runners, they should never be selected for increase; (*u*) runner layered in 3-inch pot and secured with galvanized wire peg; (*v*) runner layered in a 3-inch square of reversed turf and secured with a wire peg; (*w*) runner layered into 5 or 6-inch pot and secured with wire peg.

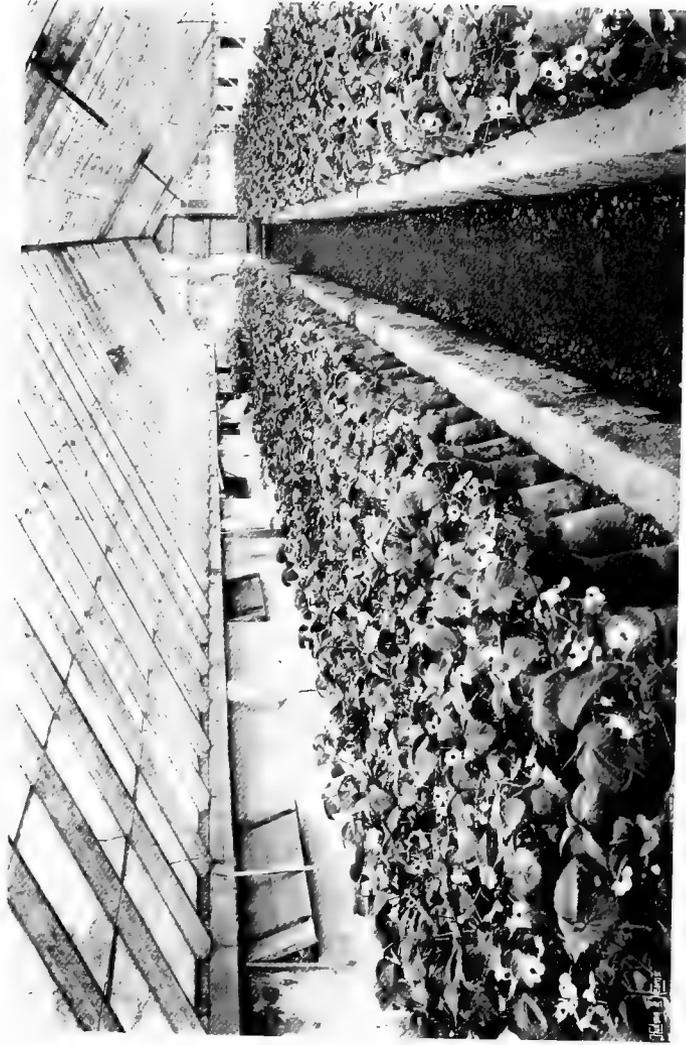
should be cut off, so that they may not interfere with the development of the layered one. Make a point also of choosing the firmest and most vigorous runners, for they will make the best plants. When sufficient plants have been secured, there remains but little to do until they are ready to be transferred to the fruiting pots. The thing to attend to is, of course, the watering, for upon the proper performance of this duty will largely depend the plants' progress. It has been before mentioned that they require a great deal of water during the period that elapses between layering and repotting. And this is due, as may be easily understood, to their being in quite small pots which become quickly filled with roots, and that the season is the hottest part of the year (the months of July and early August). Early morning, and again in the afternoon, are the best times to give water to the plants, for then it has an opportunity of soaking through the soil, and so reaching all the roots. The number of times that it is necessary to water the runners will depend entirely upon the weather; whereas one day once would suffice, three waterings would not be

too many on another occasion. Whatever the number, the layers, as we may now call them, must never be allowed to suffer from drought. To facilitate watering, tubs fixed on two wheels and a framework, with handles to enable them to be pushed along easily, are in use in many gardens, and prove most convenient.

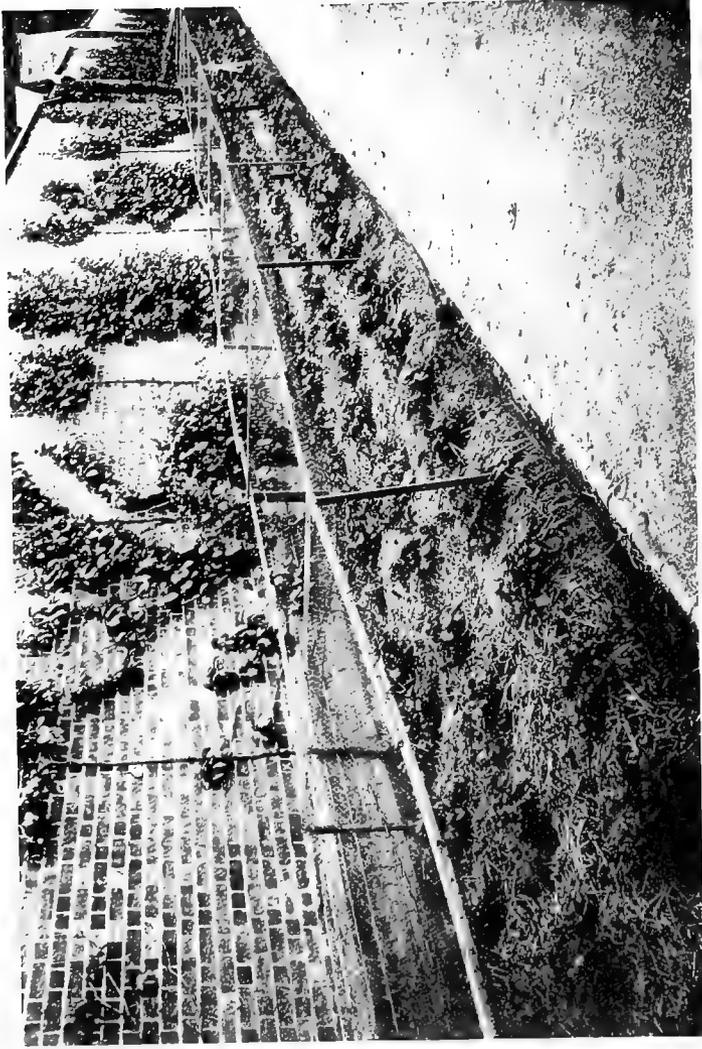
OTHER METHODS OF LAYERING.—At the commencement of this chapter it was mentioned that there were other methods of rooting strawberry layers besides the one here detailed at length. The two principal are those whereby the runners are immediately layered into their fruiting pots, or are previously (instead of being placed in small pots) layered into turves, and when rooted in these are eventually transferred to larger pots. Those who practise the first mentioned of these two methods claim that much labour is dispensed with, the strawberry plant being at once placed in the pot where it will remain until it bears fruit. The medium of the small pot is thus altogether done away with in this case. Where the plants grown in pots are few this plan may, and, indeed, does answer, but where thousands of strawberry plants are forced, and the finest possible fruit is desired, we do not advocate it. In dealing with large numbers of plants, say from five to ten thousand, one can imagine that the labour of transporting such a number of 6-inch pots filled with soil to the strawberry plantation, and then removing when rooted to the quarters assigned them for the autumn and winter, would be immense. Runners so rooted also have this disadvantage, the soil in which they are first placed has to serve them always, except for the very small amount of fresh compost that may be given as a top dressing. And exposed, as it is, to the baking heat of the summer sun (for the pots are so large and unwieldy that they cannot be plunged in the ground like small ones), and, what is more injurious still, to the force of the summer and autumn rains, it may quickly be rendered unsuitable as a rooting medium.

A serious drawback to layering the runners in turves instead of small pots, lies in the danger incurred when removing them to the fruiting pots of breaking, or otherwise damaging the roots. No doubt the layers will root as freely into the turves as they do in the small pots filled with soil, but the advantages of this method are so doubtful that we do not recommend it. In the first place, it may be almost as expensive to obtain a sufficient number of turves as it is to purchase the small pots, while the convenience of the other method, and, if ordinary care is taken, the almost entire absence of risk in transferring the plants to their fruiting pots make it preferable. Plants in small pots can be moved about in barrows, trucks, &c., with the greatest ease, and without the possibility of damaging the roots, but the same cannot be said for plants rooted in turves.

PROVIDING THE RUNNERS.—Where strawberries are grown in large quantities, and the finest quality fruits are a *sine quâ non*, a plantation should be made with the object, not of obtaining fruits from the plants, but of getting runners from them; in fact, they should be restricted to this use only. It is not difficult to believe that runners obtained from plants not allowed to bear fruits, will be superior to some extent to those taken from plants which



STRAWBERRY CULTURE IN POTS FOR MARKET.

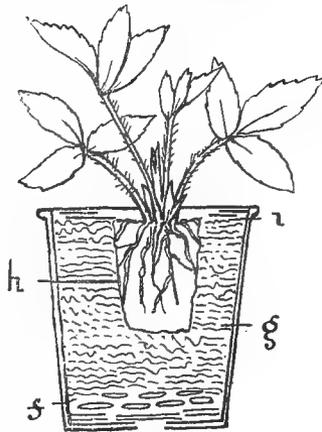


HOW TO PROTECT STRAWBERRIES FROM BIRDS.

bear a crop of fruits, as well as develop runners. In the one instance, all the plants' energies are devoted to the production of runners, and in the other they have to bear a double burden. This practice is not, of course, absolutely necessary, especially if the strawberry plants are growing upon good ground, and are well looked after; it is, however, of great advantage. For some years we made a practice of annually planting a piece of ground with strong and well-rooted runners, from which the following year we obtained splendid plants for pot culture, and the results quite justified the practice.

PREPARATION FOR POTTING.—Presuming the plants to have been layered, preparation should be made for repotting them, in early August, into larger pots in which they will bear fruit. The chief ingredient of the soil must be good turfy loam, preferably turf cut from meadow land, and built the previous autumn into a large stack. Many cultivators place a layer of manure between each layer of turves as the stacking proceeds, and this is a plan to be recommended, for the soil is made much richer thereby. There is another considerable advantage in obtaining the loam and stacking it out-of-doors the year before it is required for use. It often happens that fresh soil contains a great number of wire-worms, and if this should be the case, full exposure throughout the winter would prove of great benefit. The soil also by such exposure becomes more suitable as a rooting medium than that freshly cut from a pasture. Prepare the soil for potting, if possible, under cover, so that it may be sheltered from rain. If an open shed is not available to protect it over with boards. To obtain the best results with forced strawberries, the soil used for the final potting should be of good quality. It must be remembered that the plants remain in the pots from August until the following February, March, April, or May, as the case may be, and that the strawberry is a vigorous grower and feeder. Bearing this in mind, it will be seen

how essential it is that the soil should be good in the first place. Break up the turves with a spade into pieces about the size of a pigeon's egg, taking care not to smash it, otherwise the soil will be made too fine. With the loam should be mixed a certain amount of manure; we have found that taken from a spent mushroom bed to be excellent material. It may be used in the proportion of one-fourth to three-fourths of loam. A sprinkling of bone meal or crushed bones, and of lime rubble broken small, is also of benefit. All the ingredients should be well mixed together, and if the soil is dry it must be watered as the work of turning and mixing proceeds. It is advisable to prepare a large heap of soil in the first place, sufficient, if possible, to serve for potting the majority of the



SECTION OF 6-INCH POT WITH
PLANT PROPERLY POTTED

(*h*) Drainage; (*g*) soil, rougher part over drainage; (*h*) roots of small plant from 3-inch pot; (*i*) space for holding water when watering.

plants. It may then be transferred to the potting bench as required. If there still remain pieces of turf larger than a pigeon's egg, they should be pulled into smaller pieces by the hand before being used.

POTTING THE RUNNERS.—The most suitable pot in which the runners can be potted is 6 inches in diameter at the top. There are certain varieties grown for very early forcing that, however, do not grow vigorously even when cultivated in the open, and therefore much less so when forced early. They may with advantage be placed in pots of $4\frac{1}{2}$ inches diameter (ordinarily called 48's), for fewer roots will be made. We have tried the practice of using 8-inch pots, the size larger than the 6-inch, for some varieties of vigorous growth, but the results did not justify our repeating it. The pot made use of by those who grow strawberries for market in many thousands is the 6-inch one, and there is no doubt that it is the best.

An insufficiency of drainage, or drainage carelessly disposed, will deleteriously affect the health of the plant. The soil becomes more or less soddened and sour, because the water given does not pass away freely. First place a crock over the hole in the bottom of the pot, large enough to extend for quite half an inch beyond the hole all around. Over the single large crock place smaller ones to the depth of about half an inch. The base of the pot must be well covered, and they must not be tumbled in together haphazard, or, at any rate, the first few must not, or they will probably displace the one that covers the opening. Then select the roughest pieces of turf and place them immediately over the drainage. This will prevent any of the fine soil falling into, and perhaps choking it. Remove the rooted strawberry runner from its small pot. There should be so much material in the bottom of the 6-inch pot that when the small plant is placed therein the surface soil of the latter reaches to within about an inch of the rim of the former. Dislodge the drainage from the small plant, if this can be done without disturbing the roots, but if the roots have completely covered the crocks let these remain. With the prepared compost fill the space all round, taking care not to place too much in at once, and make it firm with a wooden rammer as the work proceeds. Continue until the surface roots of the plant have been covered with half an inch of soil. Firm potting is essential. The only time that the wooden rammer should be used lightly is in making the soil firm immediately above the roots. Care is then necessary, or the roots may be damaged. With regard to the depth at which the rooted runner should be inserted, the remarks made on this point when treating of layering are applicable. Place it so deeply that while the plant is quite covered, the heart, *i.e.* the centre whence spring the young leaves, is not.

TREATMENT WHEN POTTED.—The newly potted plants should be placed for a week or ten days in a shady position, so that the roots may get hold of the new soil as quickly as possible. This they are more likely to do in the shade than if the hot sun were shining upon them. Providing the runners were thoroughly well watered the day before being potted, they will not require to be watered for a few days; they should, however, be well syringed every afternoon.

After having been in a shady part of the garden for a week or so, they may be removed to an open and sunny position, there to complete their growth. The ground upon which they are placed should be level and hard, and covered with a thin layer of ashes. This will serve both as a cool base for the plants, and will prevent the entrance of worms into the pots. Arrange the plants in rows 9 or 10 inches apart, placing the pots about 4 inches from each other in the rows. After the sixth row, leave a small pathway sufficiently wide to allow a person to walk along for the purpose of watering. By having this passage after every sixth row of plants, the three rows upon either side of it can be watered with ease.

WATERING.—Giving water to the plants will now be the most important work of the cultivator, and this must be attended to with care. When well rooted the plants will take a surprising amount of water, two or even more applications being necessary daily during the hottest weather; and that they are not allowed to suffer from the want of water is, it need hardly be said, of the utmost importance. Every afternoon, about five o'clock, when the sun has ceased to shine directly upon them, syringe the plants, for this promotes a clean and healthy growth and keeps down insect pests. Remove all runners that appear by pinching them off when quite small, and eradicate weeds. In the early autumn examine the plants and remove any side-growths or off-shoots that have formed. These minor "crowns" or growths are valueless. When the autumn is unusually wet, strawberry plants (some varieties more than others) have a tendency to divide or to split up into several small crowns in this way. In such a case, that is, where no one growth is much better than another, the only course to adopt is to select, say, three of the best, and remove the remainder.

During the late summer a slight top dressing of some artificial manure is beneficial. It should be sprinkled very thinly upon the soil, lightly pricking it in the latter with a pointed stick to prevent its being blown or washed away.

WINTER PROTECTION.—Upon the approach of winter it becomes necessary to protect the plants to a certain extent from the effects of frost, not so much the plants themselves perhaps as the roots and the pots. There are various methods employed. Some cultivators simply stack the strawberry pots on their sides, spreading a little straw over the uppermost layer. For simplicity the method is to be commended, but the plants packed in this way often suffer from the soil becoming dry, and we think the plan we are about to describe, which has been practised in the Royal Gardens for many years with hundreds of thousands of plants, is more effectual and hardly less simple. First, place the plants closely together in a straight line; then place a layer of bracken or ashes (preferably the former) alongside the pots; next a row of plants, and press these against the bracken so that it forms an effectual layer between them. The roots will then be protected, and the pots prevented from cracking. This they are very liable to do if exposed to severe frost. Continue to place a row of plants and a layer of bracken alternately until all have been disposed of. The first row will also need covering on the outside. Many thousands of plants can be placed together upon a small piece of ground when

thus packed closely ; they are quite safe, and may be left alone until required for forcing.

PREPARING FOR FORCING.—The preparation for forcing the strawberry plant will be altogether determined by the season at which ripe fruits are required. To obtain these in the month of February necessitates much more work than the production of fruit a month or two later. During the spring months the plants make much quicker progress than is possible in the dull sunless days of November and December, and their culture then is not such an expensive matter as the very early forcing of strawberries. Most strawberries grown under glass for market are not forced early, but just sufficiently so to ripen them during the six or eight weeks immediately preceding the ripening of the outdoor crop. This is evidently found to be the most profitable method. Strawberries forced so as to be ripe in February and March command very high prices, but the demand for them is strictly limited. Although such good prices are not obtained later in the season, the quantities disposed of are so much greater, and the cost of production so considerably less, that growers realise a better profit upon their outlay. Exclusive of the high price of very early forced strawberries, another reason of their limited consumption lies doubtless in the fact that the flavour is not of the best. We speak now of fruits that are ripe in February. The quality of forced strawberries depends greatly upon the late winter and early spring. Cold and sunless weather will necessitate much artificial heat, and fruits produced under such conditions are naturally deficient in flavour. Given comparatively mild and sunny weather, however, strawberries in February and March should compare not unfavourably with those grown out-of-doors and ripening in June. If ripe strawberries are required in April, they may be had by commencing to force the plants eight weeks before, but if ripe fruits were wanted in February, it would be necessary to commence forcing quite twelve weeks previously. Cold weather and the absence of sun are, of course, responsible for the extra time involved.

VERY EARLY FORCING.—To have ripe strawberries towards the end of February the plants must be taken under cover not later than the middle of November, and the best method is to plunge them in a mild hot bed, preferably composed of leaves and made up in a frame. A better place for the plants during the first few weeks could not be wished for. The bed of leaves should be made so high that the plants when plunged therein are within 6 or 8 inches of the glass. The bottom heat will encourage root growth, and this is of great advantage, for once the roots begin to make progress the leaf growth of the plant will soon follow. For the first week or ten days the pit or frame should be quite cold so far as the use of artificial heat is concerned ; afterwards, until the plants come into flower, the temperature at night may be kept at 50 degs. Fahr. Do not open the lights to admit air during cold, damp, or foggy weather, but only when the frame would become too hot by reason of sun heat or exceptionally mild weather. Then admit just enough air (the lights need only be pushed down an inch or two) to prevent the temperature rising too quickly, and not with the object of lowering it. Close the frame early in the afternoon, and syringe the plants at the same time. By so doing a moist

atmosphere conducive to growth is produced. It will not be found necessary to give much water to the roots during the first few weeks.

THE PLANTS IN FLOWER.—If started in mid-November and thus treated the strawberry plants ought to be in flower soon after Christmas, and when in flower they must be treated very carefully. At such an early season it is no easy matter to get the flowers to “set”—a technical term indicating the formation of the embryo fruits. As soon as the first flowers appear remove the plants upon which they are produced to a house that is light and can be efficiently ventilated and heated; eventually take all the plants there as they come into flower. Place them near the glass, that is to say, within 8 inches or so, that they may have all the light possible. Keep the night temperature of the house at 55 degs. Fahr., and admit the maximum amount of air permissible under the conditions prevailing out-of-doors. If there is frost then, of course, air must not be given. Keep the atmosphere of the house dry by a judicious regulation of the heating apparatus; anything approaching dampness is fatal to the “setting” of the flowers. The object of keeping the temperature warm and dry, and of admitting to the flowers as much fresh air as possible, is to facilitate fertilisation, and this is effected because the pollen remains dry and is therefore easily dispersed. In this early forcing of the strawberry it is necessary to pass over each individual flower with a camel-hair brush so as to aid fertilisation. Unfavourable weather often prevails when early strawberries are in flower, so that every opportunity of helping them to “set” should be taken.

THE FRUITS FORMED.—In a week or ten days after the opening of the flowers there ought to be a sufficient number of fruits “set,” and to be able to determine when the embryo fruit is properly formed is most important. If the plants are placed in a warm and moist house before the young fruits are really formed these will prove a complete failure. Instead of at once commencing to develop as they should, the tiny fruits will become hard and stunted, and, although they may reach maturity, will be so mis-shapen, under-sized, and flavourless as to be useless. To be able to say positively that the fruit is “set,” all the numerous tiny yellow pistils that cover the receptacle (really the embryo fruit) should have shrivelled. So long as they remain yellow they are not fertilised. Flowers whose centres turn black should be picked off, for they are useless. Before removing a plant from the cool and airy house in which it has been while in flower make sure that a sufficient number of fruits are properly formed. It is quite a false idea to think that the development of the fruits may be hurried by placing them in a warm house immediately the petals have fallen, for this does not necessarily indicate that the embryo fruits are perfectly formed. Not only is nothing gained by removing them from the cool house too soon, but very often serious losses may ensue through doing this. It is impossible to attempt to force strawberries with success before they are perfectly formed; instead of being hastened their development will be arrested, and the fruits will most probably be spoilt.

Leave the plants in the cool house for a few days after all the tiny pistils show by turning colour that they have been fertilised; it is far pre-

ferable to let them remain cool a little too long than not long enough. If perfectly "set" the fruits will, when placed in a warm, moist house, make rapid progress. The night temperature of the house in which the plants should be grown when their fruits are "set" may be from 60 to 65 degs. Fahr. for the first two weeks. It may then be increased to 70 degs. Syringe the plants frequently, and keep the atmosphere of the house moist. Admit a little air during favourable weather, but close the house early in the afternoon, well moistening the plants and their surroundings at the same time. Attend carefully to giving water to the plants, never allowing the soil to become at all dry, or the development of the fruits will be checked. Weak farmyard manure water or sprinklings of guano upon the surface of the soil are of great benefit while the fruits are swelling. In the course of several weeks it will be noticed that the strawberries turn from green to almost white, and this indicates the period of colouring to be near. Not until they are changing to the red colour that denotes the near approach of ripeness must there be any change in the cultural methods. Everything possible should be done to assist and encourage the fruits to develop rapidly by maintaining the proper night temperature, admitting air on all favourable occasions, closing the house early so as to make it naturally warm, and always keeping the atmosphere moist. As the fruits approach ripeness, that is to say, when they are about half coloured, the temperature of the house should be lowered to 65 degs. (leaving a little air on throughout the night if the weather is mild), the amount of moisture lessened, although the water given to the roots should not be diminished; not until the fruits are almost ripe should less water be given. The cultivator must judge for himself when development of the fruits has ceased, and then, of course, less water will be required; the strawberry, however, really grows to within a few days of its maturity. The flavour of forced strawberries is much improved by a free circulation of air about the ripening fruits: the grower should bear this in mind, and take every opportunity of admitting it. Fresh air need not delay the ripening of the fruits, for the house may still be closed early in the afternoon, so as to increase the temperature; if the nights are not cold a little air should always be left on the house in which strawberries are ripening.

A SUCCESSION OF FRUITS.—From the ripening of the first forced strawberries until fruits are gathered out-of-doors, most cultivators endeavour to maintain a continued supply, and this is not a difficult matter if the plants are removed to warmer quarters in sufficient numbers and at regular intervals. As brighter and longer days are experienced the forcing of the strawberry will neither be so difficult nor take so long as earlier in the year. Plants from outside, where they have been protected by bracken during the winter, and placed in warmth in early January, may be expected to produce ripe fruits in nine or ten weeks' time. Plants not forced into fresh activity before the end of January should give ripe fruits in eight weeks. The progress made by plants forced during January and February depends very much upon the weather then experienced; when these months are over bright days are the rule rather than the exception, and the strawberry grower has rarely occasion to trouble himself

about the weather. In January and February, however, it is different, and therefore when we say that ripe fruits may be had in nine or ten weeks' time from plants started in early January the weather is presumed to be moderately favourable.

The quantity of fruits required and the number of plants at disposal will determine how many of the latter should be placed in heat together. Most forced strawberries are placed on the market in April and May, for then they are obtained at a minimum of cost and risk of failure. It is certainly an advantage in forcing strawberries during the month of January to plunge the plants in a mild hot bed upon removing them from their winter quarters out-of-doors. They are thereby assisted considerably in making fresh roots. With plants started later, however, this precaution becomes unnecessary, unless the weather during February proves to be exceptionally cold. There are numerous positions in the glass-houses of every garden that are well suited to the forced strawberry plant. Vineries and peach-houses at rest or just started, cold pits, or frames that are empty, do admirably. In cold houses little growth is made, but after a few weeks there the plants, when placed in a warmer house, make quicker progress than if they had been left out-of-doors altogether.

TEMPERATURE.—Nothing is more injurious to strawberry forcing than a high temperature at first. Until the flowers have appeared and the fruits have formed, artificial heat should be most carefully requisitioned. The night temperature during the first fortnight should be 50 degs. Fahr., to be raised the next week to 55 degs., and afterwards increased to 60 degs., there to remain until the fruits have "set." An abundance of air on all favourable occasions when the strawberry plants are in flower is very necessary. Air both at the top of the house and at the bottom should be given so as to provide a circulation around the plants. Keep the atmosphere dry.

When the fruits are "set"—and they will form much more readily than early in the year—remove them to a house where the night temperature is 65 degs. Fahr., placing them near the glass. Before doing so, however, thin out the fruits, leaving six or seven only upon each plant. These will be quite sufficient if the finest strawberries are to be obtained. The thinning required will altogether depend upon the number of fruits "set." Supposing four or five only to have formed, they would of course be left untouched. That the largest and best-shaped fruits should be allowed to remain is obvious.

It is of advantage if a house can be devoted solely to strawberry forcing, for much labour in moving the plants to warmer houses is thereby saved. When a sufficient number of fruits are "set" upon each plant, the house may then be kept moist and warm to encourage the development of the fruits. When the fruits are properly formed, they can really be "forced," for once well "set" the fruits may with advantage be given plenty of heat and moisture. Syringe them frequently several times during the course of the day. Close the house early in the afternoon (it does not matter if the thermometer then registers 80 to 85 degs.) and moisten the walls, floor, &c. Increase the temperature from 65 to 70 degs. in a fortnight after bringing the plants into a warm house.

STRAWBERRIES IN COLD FRAMES

A crop of excellent strawberries can be obtained from plants grown in a cold frame, and they will be ripe some few weeks before those outside are ready for picking. Ripening as they do when the forced fruits are almost over, and before outdoor fruits are ready, these strawberries are much appreciated; they are, moreover, of the best quality. Preparation for this phase of strawberry culture consists in making up a bed of leaves in the frame in August to within about 18 inches of the glass. Make the bed quite firm by treading. Upon this place a layer of good turfy loam 9 inches deep, making this firm also. Good plants layered the previous month, July, should be planted in the bed of soil in rows 2 feet apart, each plant being distant from the other 18 inches. Plant them firmly. Beyond the very necessary item of giving water when it is required, these plants will need little attention for some time. Remove all runners that appear and eradicate weeds. The glass lights should be left off until the approach of bad weather, say November, then place them on the frame there to remain during winter. Air, however, may be given almost every day, except when there is severe frost or heavy fog. In wet weather the lights can easily be raised at the back of the frame to admit air, and the water will at the same time drain away.

With the approach of bright weather plenty of air must be given to prevent the plants making too rapid progress, and bearing fruit before it is required, for the great value of strawberries grown in a cold frame lies in their ripening just before those out-of-doors. Some of the finest dishes of strawberries grown at Frogmore have been obtained from plants grown in a cold frame. One should endeavour to have them in flower by about the end of April. The fruits can afterwards be either retarded or advanced as is necessary. When the fruits are developing, manure water given to the plants is of great assistance. In good soil and allowed to grow naturally, they produce many more fruits than do plants in pots treated similarly. One can always be certain of obtaining a good crop of fruits, for the plants are safe from the spring frosts which often do so much damage to strawberry plants in flower out-of-doors. The frame should be covered with mats when sharp frosts are probable. We have found no varieties better suited for this method of culture than Royal Sovereign and La Grosse Sucrée.

STRAWBERRIES IN THE AUTUMN

A gathering of strawberries in the autumn is not now a great luxury, for with the introduction of autumn-fruiting varieties, they are comparatively easily obtained. With the autumn-fruiting varieties proper we are not, however, at present concerned, for they are treated of separately. We would now point out how, with very little trouble, strawberries may be obtained twice in one season from the same plants—in spring, and again in the autumn. It is usual to consign forced strawberry plants to the rubbish heap when the fruits

have been gathered from them. Those, however, who appreciate strawberries in the autumn should save some of the best. For several years we made a practice of keeping some hundreds of forced plants of Royal Sovereign when they were removed from the houses. These were carefully attended to during the summer months, all runners and weeds removed, water given, &c. Old soil to the depth of about 1 inch was removed, and replaced with new turfy soil with which some artificial manure had been mixed. During August when the flowers appeared, manure water was often given, and its use continued during the development of the fruits. The plants were grown in a sunny position, and placed sufficiently wide apart to allow a circulation of air all about them; morning and evening they were thoroughly well syringed: this is an important item, for it greatly helps to keep that pest, red spider, in check. By following this treatment, and thinning the fruits to six or eight on each plant, we were able to gather strawberries throughout September and part of October.

VARIETIES

The strawberry that market growers cultivate under glass in preference to any other is Royal Sovereign. And it has been the experience of most that no variety produces better early fruits than Royal Sovereign. Even for fruiting very early in the year it is the best we have tried. Having grown several varieties side by side in order to test their respective merits for early forcing, the opinions formed of them and their characteristics may be of value. It is, however, to early forcing alone that these remarks apply. Probably, if these strawberry plants had been placed under glass in late March or early April, there would not have been so great a difference in their qualities. It should be mentioned that very dull weather prevailed during the greater portion of the first few weeks after the plants mentioned below were placed under glass, thus accounting for the apparently long time that elapsed before flowers were produced. The varieties under trial were the following: Royal Sovereign, La Grosse Sucrée, President, British Queen, and Keen's Seedling. On the 26th January fifty plants of each (with the exception of Keen's Seedling, of which there were but forty) were placed under glass in a temperature of 55 degs. Fahr., raised after a week to 60 degs. The first variety to come into flower was British Queen. On 18th February there were two flowers open upon a plant of this, though, strange to say, the number remained the same for ten days afterwards. It was not until 1st March that more flowers expanded: six were then open. No less than eleven plants of British Queen were of no value, either through being totally blind, or producing puny, badly-formed blossoms. Of the remaining thirty-nine, twenty-seven were in flower by 6th March, the other twelve opening shortly afterwards. Next in order came President, with one flower out on 20th February, and this was quickly followed by many others; thirty-eight were open on 27th February, and by 3rd March forty-six were in flower, the remaining four being blind.

La Grosse Sucrée first opened on 23rd February. On 1st March forty-two

blooms were out, and the full number (forty-four) were in flower by 6th March, the remaining six being useless. Also on 23rd February, exactly four weeks from the time of starting, Keen's Seedling opened its first flowers. Twenty-one were expanded on 27th February, and by 6th March the full number of good ones (thirty-three out of forty) were fully open. Royal Sovereign did not come into bloom until 28th February, being the last one to do so. By 6th March, however, thirty-six plants were in flower, and five more quickly followed, thus leaving nine blind ones.

The percentage of healthy flowering plants of each variety was as follows:—President, 92 per cent.; La Grosse Sucrée, 88 per cent.; Keen's Seedling, 82½ per cent.; Royal Sovereign, 82 per cent.; British Queen, 78 per cent. President, closely followed by La Grosse Sucrée, thus had the highest average, British Queen the lowest, Royal Sovereign and Keen's Seedling being almost equally good. Notwithstanding the excellent start made by President and Keen's Seedling, so far as the production of flowers is concerned, the ultimate results, without doubt, marked Royal Sovereign and La Grosse Sucrée as the most suitable and satisfactory. The former produces strong scapes bearing numerous large flowers that have plenty of pollen, and set remarkably well. In order to have plants of La Grosse Sucrée at their best so early in the season, they should have plenty of light, otherwise the flowers instead of developing properly often remain among the leaves, a state of affairs detrimental to their fertilisation. For a first early strawberry, to be started in November, Royal Sovereign is the better of these two. Its flowers are borne upon longer and more vigorous stalks than those of La Grosse Sucrée, and are, therefore, not affected to the same extent by the dull, sunless weather invariably experienced at that season. A point in favour of La Grosse Sucrée is that it does not require nearly so much room for development as does Royal Sovereign. The latter variety, as is well known, grows very freely and produces more foliage. The fruits of these two strawberries are totally different in colour and appearance, so that it is a matter of opinion as to which is the better. Well-developed fruits of La Grosse Sucrée are rather smaller than those of Royal Sovereign, of a deep, crimson colour, and very sweet. The fruits of the latter are bright red with prominent seeds, lacking the fine flavour of the former, though more freely produced, and of handsome appearance. Keen's Seedling also has an abundance of dark-green foliage, and bears numerous flowers—small and weak compared to those of Royal Sovereign—that set fairly well. The ripe fruits are small, of very pleasant flavour, and of quite dark colour. British Queen has proved the least satisfactory; the flowers were few, badly formed, and “set” but indifferently. Though one of the best flavoured strawberries in cultivation, if not the best, its constitution is certainly such as to render it unfit for early forcing. President produced numerous flowers, but they were weak, small, and far from satisfactory.

Doubtless if more favourable weather had been experienced during early spring some of these varieties would have done better, but as the chief value of a strawberry suitable for early forcing lies in its weather-defying capabilities, the fact of the above-mentioned ones proving of little worth marks them as

unsuitable for the purpose under consideration. Later in the season, as the days lengthen and the sun increases in power, they probably would succeed under pot cultivation ; possibly there are few strawberries that would not. We have forced a few plants of James Veitch, and found them to do very well. The flowers are large, of good substance, and set easily ; the fruit is pleasant in flavour, though its colour—a rather dull red—is not of the best.

List of varieties for first early forcing in order of merit :—*Royal Sovereign, La Grosse Sucrée, Vicomtesse Hericart de Thury.*

Varieties for later forcing in order of merit :—*Royal Sovereign, La Grosse Sucrée, President, Sir Charles Napier, James Veitch, Auguste Nicaise, Sir Joseph Paxton.*

INSECT PESTS.—Strawberries do not suffer greatly from the attacks of insect pests ; red spider and green and white fly may be said to be practically the only ones. It has, however, a serious enemy in mildew, and it is more often attacked by this disease than by any other. A damp, stagnant atmosphere conduces to the spread of this fungoid disease, and it should therefore be avoided. Smearing the hot-water pipes with sulphur or dusting the leaves with this will check its progress. Great care must, however, be taken to prevent the pipes becoming very hot, or the plants may suffer severely from the burning fumes that would arise. Mildew will often attack the strawberry plants before they are brought under glass, indeed, it often makes its appearance a few weeks after the plants have been potted into their fruiting pots. Should the season be a wet one, mildew is usually much more troublesome than during dry and warm weather. The mildew on the strawberry plants is frequently contracted before the layers are detached from the old plants ; these should be carefully examined before they are transferred to the fruiting pots, and if found to be affected should be heavily dredged with flowers of sulphur, and isolated from plants not affected until the mildew is destroyed. An occasional fumigation with XL-All insecticide should suffice to keep down the green and white fly.

ALPINE STRAWBERRIES

By JAMES HUDSON

The cultivation of Alpine strawberries in this country has not been so successful as upon the Continent. To a great extent nurserymen are responsible ; they have for years past persistently catalogued “runners” only, whereas seeds and seedling plants should be offered in the lists of strawberries. Between the seedling plants and the “runners” there is no comparison whatever, either in freedom of growth, vigour of constitution, or in fruit-bearing qualities. The advantage is on the side of the former in a most marked degree. Having for several years past cultivated Alpine strawberries from seed, I speak with confidence when I recommend the continental system of cultivation. It may occasion a little more labour at the outset, such as pricking off the seedlings into boxes or frames in order to secure strong plants.

CULTURE.—By the French growers seed is recommended to be sown in the autumn. I find, however, that it occasions less trouble and economises

space if done in the spring. We sow the seed in March or April, one sowing in each month. In doing this we follow the same practice as with celery. The seed germinates better and more regularly in slight warmth, but care must afterwards be taken not to allow the seedlings to remain under these conditions after having made one or two rough leaves. Then it is better to harden them off in a cold frame. By the end of May or early in June the seedlings should be pricked off into boxes, as is frequently done with celery earlier in the spring. Keep them for a week or two under protection, and they will be fit for placing outside. Towards the end of July the young plants are planted out, about 6 inches apart each way, in light well-prepared soil upon an eastern border, where only the morning sun reaches them. Attention to watering follows as a matter of course from the seedling stage onwards until the plants are well established in the autumn. Every day this should be attended to. If an eastern border is not available, one facing north will be better than one fully exposed ; or, failing that, such as may be afforded by the partial shade of trees.

During October the ground should be selected and duly prepared by trenching and manuring. An open position, or one slightly shaded by fruit trees, will answer for this ; at any rate, a little more shade than the ordinary strawberries prefer will not do any harm. It is convenient to plant in beds rather than in continuous rows equal distances from each other. Our method is to plant four rows at 18 inches apart, then miss one row. This gives a good space for working and picking, two rows being worked from either side. We plant firmly, and always water the plants afterwards. With the exception of using the hoe a few times no other work is necessary until growth begins again in spring. Then the surface of the soil should be lightly stirred and all weeds kept down. When the young plants show their first flowers we pick these off, and continue to do so until the first week in July, by which time the plants have gained their full vigour. For very late crops the flowers are removed until nearly the end of July. These plants will begin to fruit by the middle and end of August, when a daily gathering may easily be had. This will continue well into October, frequently till the end of the month if frosts are not too severe. The "runners" are picked off until the time of fruiting. The second year the plants are allowed to fruit early, and continue to yield a good supply until the next lot of seedling plants are again in bearing. The fruits will ripen about the same time as Royal Sovereign. The old plants are then destroyed ; the ground is at once prepared for some other crop or for the next lot of seedling Alpines (we find them do well upon the same ground year after year). A light mulch should be put upon the seedling beds in May or June, and upon the old beds if necessary. This can be done about the usual time. I prefer first to mulch with partially decayed leaves and then with quite short litter, so as to afford both food for the plants and shelter from the heat of the sun, as well as to protect the fruits from harm. Water should be given freely whenever necessary, but manure water is not essential. The fruits are gathered early in the morning into small ornamental baskets in which they go direct to the table, chiefly for break-

fast. If intended for sending away put them into square punnets. In no case should the fruits be handled a second time. Each fruit is picked without the stalk, except in the case of such as are picked singly for sending long distances.

VARIETIES.—The varieties now grown are greatly superior to the old ones. The list is not a long one. I find the best to be :—

ROUGE AMELIORE, OR IMPROVED RED.—This variety has a very long fruit, is of vigorous growth, crops well, and is admirable for long distance packing. It is bright red in colour.

BELLE DE MEAUX.—The fruits of this variety are obtuse in shape, dark colour, and of first-class flavour.

JANUS.—Similar to the preceding in most respects, but not so dark in colour.

SUTTON'S LARGE RED.—A good selection, very prolific, and of free growth.

BLANC AMELIORE, OR IMPROVED WHITE.—This is the best white variety, and should be grown for the sake of its colour, besides which it is a good cropper.

There are also the two varieties which do not produce runners, Sans Filets Rouge and Sans Filets Blanc. These I do not recommend for culture in this country. They are not so prolific, at least that has been my experience of them. They make dense plants, owing no doubt to the absence of runners, but do not crop so well. It is my conviction that the Hautbois strawberry, if treated in a similar way and raised annually from seed, would be far more satisfactory than from runners.

THE BEST STRAWBERRIES

By GEORGE BUNYARD

AUGUSTE NICAISE.—*Fruit* bright scarlet; first fruits very large, cockscomb-shaped; later berries round and regular; *sepals* reflexed, showing smooth neck; *flesh* orange-red, richly flavoured; *foliage* bold and broad, close and compact. Except for preserving, this variety is not recommended for outside culture, but as a second-early for forcing it is remarkably good. It sets freely, and the berries are often 2½ ozs. in weight; even when forced, they possess unusually good flavour.

BRITISH QUEEN.—*Fruit* long, wedge-shaped; orange-red, quite yellow on the shaded side; *sepals* very large; *seeds* small, prominent; *flesh* firm, white, rich, sweet, pine flavour; *leaves* pale-green, with hoary footstalks. This old and esteemed variety is worth very careful culture, and succeeds best on chalky or loamy soils. The crop is never large, but the good quality of the fruit will always commend it to the amateur. The foliage is very hairy and subject to red spider, therefore it is advisable to syringe the plants freely after the fruit is gathered. This fruit is not figured, but it much resembles Dr. Hogg.

COUNTESS.—*Fruit* oblong, often wedge-shaped; *colour* deep red, often mulberry coloured; *seeds* small; *flesh* firm, marbled red. A variety of first-class flavour. *Foliage* bold on short green footstalks; *habit* compact. May be planted 1 foot apart. One of the very finest sorts. Of handsome, glossy appearance, and splendid quality.

DR. HOGG.—First fruits flattened, wedge-shaped; later berries long and pointed; bright glowing pale scarlet; *seeds* prominent; *flesh* firm, white, rich luscious flavour; *foliage* deep green, hoary beneath. This is certainly the finest flavoured strawberry grown. It prefers a deep heavy soil; ironstone and clay should be introduced where the soil is light. It resembles British Queen, but is of better habit; the flesh is not so

tough. The plants can be placed rather closely, and should not be kept over two years, as the fruit from older beds is small and indifferent. Worthy of careful culture.

DUMBARTON CASTLE.—*Fruit* three-sided and pointed; orange red; *seeds* deeply set; *sepals* hoary; *flesh* firm, pleasantly acid, pale; *foliage* deep green, compact, covering the fruit. Plant 1 foot apart. A variety which succeeds the main crop, and is very prolific and useful.

EDOUARD LEFORT.—*Fruit* deep black-red; *seeds* deeply bedded; *sepals* reflexed, exposing a smooth neck; *flesh* red; *flavour* rich. A variety more suited for earliest forcing than for open ground. More vigorous than La Grosse Sucrée: the plants form more crowns, and thus produce a larger crop of fruits. Not figured, but resembles Kitley's Goliath.

ELEANOR (Oxonian).—*Fruit* bluntly oblong; *colour* striking carmine red to deep red; *seeds* few and deeply set; *flesh* red, firm. A handsome late variety of large size. *Flavour* briskly acid; *sepals* prominent; *leaves* pale green on short, wiry footstalks. A great bearer. The fruit is borne on long stems away from the foliage. Still one of the largest late varieties. It requires to be eaten with sugar. Invaluable for a late supply. Of compact habit.

ELTON PINE.—*Fruit* long, wedge-shaped, sometimes rather flat; deep shining crimson red; *seeds* small; *sepals* clasping the fruit; *flesh* firm, red; *flavour* distinct and good, but rather acid; *foliage* dark green, shining; *flower-stalks* long; *stems* pale green, and hairy. An old and justly esteemed variety for a late supply. One of the best for preserving.

FILBERT PINE.—*Fruit* rather long, pointed; *seeds* dark, showing clearly in the orange-red skin; *flesh* very firm, white, has a distinct rich flavour; *foliage* most robust, dull green; *flower-stalks* abundant, rising above the leaves. An old and justly esteemed sort for a late crop, well repaying extra attention in a dry season.

FROGMORE LATE PINE.—*Fruit* long, conical, dull red; *seeds* prominent; *sepals* large, reddish; *flavour* rich and excellent; *foliage* pale green; *growth* close and compact, with an unhealthy look. This variety is valuable for a late crop, and should be planted on a north border, and well fed in June if the season is dry.

HAUTBOIS.—*Fruit* produced in erect bunches of six to eight, of a dull blood red colour when ripe, of rich aromatic flavour, greatly esteemed by many; *foliage* dull green, downy, and produced in a compact bush-like form; *habit* neat and suitable for edging paths. The flowers are conspicuous, thrown well above the foliage. There are two varieties worth culture, the Royal Hautbois and Belle d'Orléans; they are practically alike.

KITLEY'S GOLIATH.—*Fruit* bright glowing red, irregularly pointed; *seeds* quite deeply set; *flesh* soft, melting, pale colour; *sepals* clasping the berries; *flavour* brisk, refreshing, and juicy; *foliage* very robust; *leaves* glossy green, deeply toothed, on long weak footstalks. Fruit produced very freely on long stems. One of the finest and best flavoured for town gardens or home use. It is too soft to travel; an enormous bearer.

LA GROSSE SUCRÉE.—*Fruit* irregular and pointed, rich glossy red; *seeds* black and deeply set; *sepals* reflexed, showing a smooth neck; *flavour* very sweet and rich; this variety has scanty foliage, and seldom has more than one crown; *leaves* deeply toothed on spreading footstalks. Owing to its habit this variety should be planted 1 foot apart, but it is scarcely worth cultivating out-of-doors. Its value lies in its adaptability to pot culture for earliest forcing. The crop is never large. In appearance it much resembles Kitley's Goliath, but has a long smooth neck.

LATEST OF ALL.—*Fruit* pale red, very large and irregularly heart-shaped, furrowed, does not always ripen well; *seeds* numerous on surface; *flesh* firm, white towards centre; *flavour* aromatic, sweet and rich, resembling British Queen; a handsome and indispensable variety; *foliage* pale green, downy beneath, not abundant. Liable in hot soils to take red spider; should be planted on a cool and shaded border. The name is unfortunate as there are several later sorts; its place is at the end of the mid-season varieties.

LOUIS GAUTIER.—*Fruit* round or cockscomb-shaped; *seeds* dark; *colour* striking, peach pink; *flesh* lemon-white, soft and melting, of pleasant flavour; *sepals* small;

foliage dark green, rather small, on dark footstalks; an enormous bearer, and one that every garden should possess. The plants resist hot weather, and have also the advantage of fruiting again in the autumn. On the dessert table it is much appreciated as a change from the red strawberries; valuable for town gardens, being hardy and vigorous.

MENTMORE.—*Fruit* of dull red colour throughout, large, of regular shape; *seeds* deeply set; *flavour* sweet and luscious; *foliage* large; *growth* compact, bearing profusely. Not yet fully proved, but is very highly spoken of.

NEWTON SEEDLING.—*Fruit* long and pointed, deep shining red; *seeds* black; *sepals* slightly red; *flesh* firm, pale pink, somewhat acid; *foliage* deep bluish green, rather sparse; *leaf-stalks* red; *flower-stalks* very long and branched. The flowers alone render this variety worthy of a place in the garden, being large and primrose colour. An enormous bearer and valuable for market sale as a late variety. The fruit forms a complete fringe outside the leaves. So vigorous that the plants may be set a yard apart each way.

PRESIDENT (Green's).—The early fruits squarely wedge-shaped; late ones often round; *colour* bright red; *seeds* small, deeply embedded; *sepals* clasping fruit; *flesh* firm, pale red, soft and melting; *flavour* briskly acid, good; *foliage* deeply toothed, bright shining green, very robust on long green footstalks. This is one of the best for the main out-of-doors crop and also for forcing under glass.

QUEEN OF DENMARK.—*Fruit* small, but produced in great profusion, long and irregular; *seeds* small; *sepals* hoary, clasping the fruit; *flavour* very rich, first-rate; *foliage* strong and upright, olive green; *flower-stalks* long, and thrown above the leaves. A most valuable variety for a late crop when planted on a north border. It bears an enormous crop.

ROYAL SOVEREIGN.—*Fruit* very large, abruptly wedge-shaped or pointed oval, bright red, glossy, with small seeds slightly embedded; *flesh* firm; *sepals* orange red; *flavour* briskly acid, juicy, pleasant; *foliage* very robust on long red footstalks; *flower-stalks* longer than the foliage. One of the earliest to ripen, and the best for early forcing. It has not the rich flavour of some varieties, but for general usefulness over a long season it cannot be surpassed. Its vigorous habit insures success on soils where better sorts fail; if only one is grown Royal Sovereign is the variety to choose.

SIR CHARLES NAPIER.—*Fruit* irregular, both round and cockscombed, smooth, with short neck; *colour* bright red; *seeds* dark, lying on the surface; *flesh* orange, paler near centre; *flavour* briskly acid. *Sepals* spreading; *foliage* thin, pale green, on stiff footstalks; of moderate growth. The fruit is firm and carries well. The foliage has an unhealthy appearance. A variety that is not always satisfactory; succeeds on gravelly soils. Good for preserving.

STIRLING CASTLE.—*Fruit* small, pointed or wedge-shaped, of rich, distinct flavour. A profuse bearer. In foliage and habit this closely resembles Vicomtesse H. de Thury, and we cannot see much difference between them. It is a good cropper, and valuable for preserving.

SIR JOSEPH PAXTON.—*Fruit* bright red, glossy, regularly pointed, seldom flat or cocks-combed; *seeds* deeply set; *sepals* spreading; *flesh* firm, pale colour; *flavour* slightly acid; *foliage* deep dull green, very robust. This is a favourite market strawberry, as it is of a grand colour. In gardens under good culture it is passable, but there are many better for private use. It is, however, valuable for preserving, hardy, and free-bearing.

THE LAXTON.—Although at the time of writing this new variety has not been sent out, experts report so favourably of it that it is included. It is earlier and larger than Royal Sovereign, darker and brighter in colour, and of grand flavour. The plant is vigorous and hardy, and a prodigious cropper. F.C.C., R.H.S. 1902.

THE NOBLE.—*Fruit* bluntly round, sometimes very large; blood-red coloured all through; *seeds* small; *sepals* uneven; *flavour* mealy, second-rate; *foliage* very vigorous, deeply toothed, robust; *flower-stalks* just covered by foliage. This variety is valuable upon soils that will not grow better sorts, the fruits ripen early, are most abundant, and grand for preserving.

TRAFALGAR.—*Fruit* bright red, irregularly wedge-shaped; *flavour* very rich and sweet; *sepals* clasping; *foliage* moderate. Flowers abundant, rising above the foliage. This recent variety has not been fully proved, but it is evidently a useful late one. The raisers claim that it is the best flavoured late strawberry known.

TROLLOPE'S VICTORIA.—*Fruit* globular and flattened at apex, very pale orange-red; *sepals* small and blunt; *seeds* deeply set; *flesh* soft and melting, of a rich pine flavour; *foliage* very broad, strong, and robust; *habit* compact. A good variety for town gardens. The glossy foliage, free from hairs, is not subject to red spider. A great bearer. The fruit ripens perfectly, but being rather soft should be gathered into the dish.

VICOMTESSE HÉRICART DE THURY.—The *fruit* is generally round, but the earliest are often wedge-shaped; *colour* dark red, with small seeds deeply set; *flavour* rich, piquant, and quite distinct; *sepals* clasping the berry; *flesh* firm, travels well; *foliage* robust and strong. This is one of the very best strawberries; although the individual fruits are small, the crop is enormous. It is always appreciated on the table, while there is none better for early forcing or for preserving. It has the merit of succeeding under trees, in town gardens, and gravelly soils, and is indispensable for small gardens.

WALLUFF.—*Fruit* globular, bright orange crimson; *seeds* small; *sepals* small; *flavour* briskly acid; *flesh* pale orange-red; *foliage* very robust. A distinct and valuable rather late variety, bearing freely.

WATERLOO.—*Fruit* very large, mostly three-sided, deep mulberry red, very glossy; *flesh* white; *seeds* small, in round cavities; *flavour* juicy, melting, rather acid; *foliage* rather sparse and mottled green; *flower-stalks* long, bearing the fruit well above the leaves. The plants may be left for three years. An excellent late variety of striking appearance and size. A good watering with liquid manure—after the flowering is past, and before the fruit swells—will be very serviceable, as at the time this variety ripens, we generally get very hot, drying weather. The water should be placed between the rows, not near the plants.

AUTUMN FRUITING VARIETIES

LA CONSTANTE D'AUTOMNE.—*Fruit* globular, bright red; small, but produced in great profusion; *flesh* white, very melting; of rich flavour; *foliage* very dark green, abundant. This is one of the very best for autumnal bearing; the old plants, and even runners, give a large gathering until the frost. This strawberry resembles St. Joseph in shape.

ST. ANTOINE DE PADOUE.—*Fruit* bluntly round; *colour* deep red to claret red; *seeds* small; *flesh* white; hautbois flavour; *foliage* broad, very stout and rough. The great value of this variety consists in the fine crops of fruit it produces in the autumn. It is by far the largest autumn-fruiting strawberry yet introduced, and is very vigorous in growth.

SAINT JOSEPH.—*Fruit* glossy red; *seeds* slightly embedded; *flesh* firm, of rich sweet flavour; *foliage* deep olive-green, compact and plentiful, downy beneath. This is one of the most healthy free-bearing sorts for an autumnal crop, and bears profusely until the frost.

CHAPTER XVII

THE TOMATO

By OWEN THOMAS

So much value is now attached to the tomato as a summer fruit that its inclusion in important collections is common. Even so long ago as the sixteenth century it was a common article of dessert among the Portuguese. Lunan says of this fruit, "I have eaten five or six raw at a time. They are full of a pulpy juice, and of small seeds, which you swallow with the pulp, and have something of a gravy taste." The tomato is a native of South America, and probably also of Mexico, whence it appears to have been brought by the Spaniards. It was common in continental gardens as far back as the year 1583, and according to "Hortus Kewensis" it found its way into England in 1596, but is supposed to have been introduced previous to that date, as Gerarde mentions it in the early part of his voluminous work as growing in his garden. From the same authority we also learn that the yellow variety is as old as the red, for he says: "There has happened into my hands another sort agreeing very notably with the former, only the fruit whereof was yellow." In England the tomato was regarded as of little value until some twenty or thirty years ago. Since then it has been gradually but surely rising in public favour, and so important has it become that it may legitimately claim to be classed as a dessert fruit, and so we propose to treat it. It is not too much to say that no product of the garden of late years has grown in popularity to such a degree as the tomato. The methods practised by our home growers to meet the greatly increased demand have been on a large scale also, many hundreds of acres being covered with glass for the culture of this fruit alone. So large has been the demand of late years that the home supply is totally inadequate, and hundreds of tons are imported annually, chiefly from the Canary and Channel Islands.

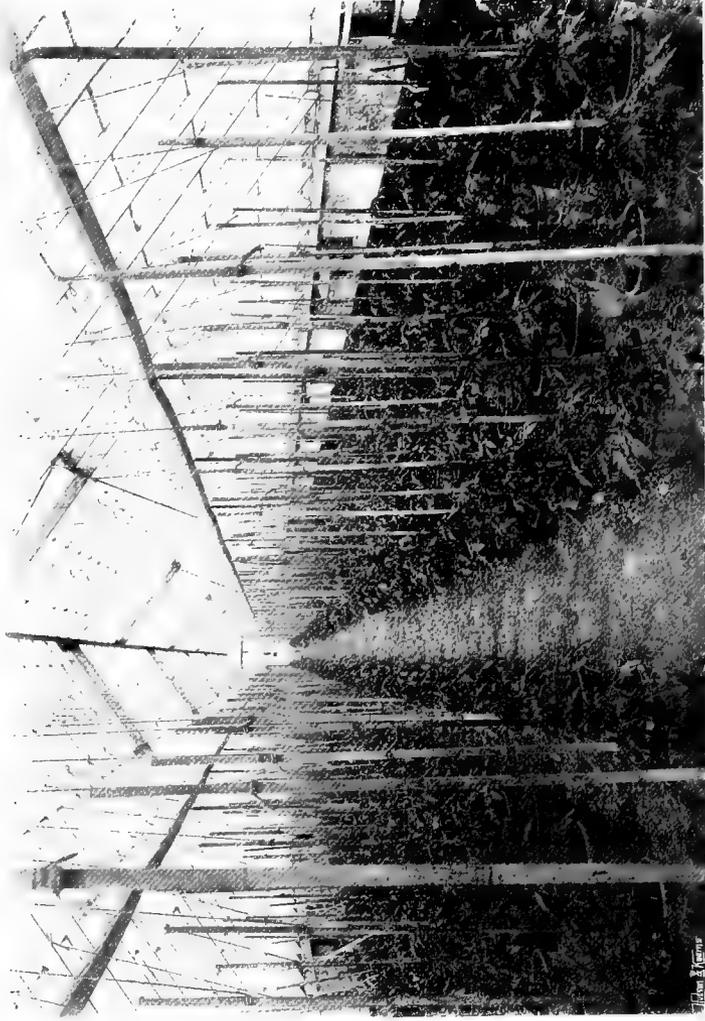
The uses of the tomato in cookery are so varied that there seems no limit to its usefulness. I venture to say that when the knowledge of its culture is acquired by our artisans and labourers with gardens in country districts, it will become an article of daily food among them, and, moreover, as useful and profitable as the poultry or pig yard. The tomato is one of the easiest fruits to grow, and also one of the heaviest and most consistent croppers. Under glass it is quite at home in any position where it can have light and a small amount of heat. It is quite happy in the cottager's allotment, greenhouse, or even as a window plant.

CULTURE UNDER GLASS.—Although I have stated above that it is of easy

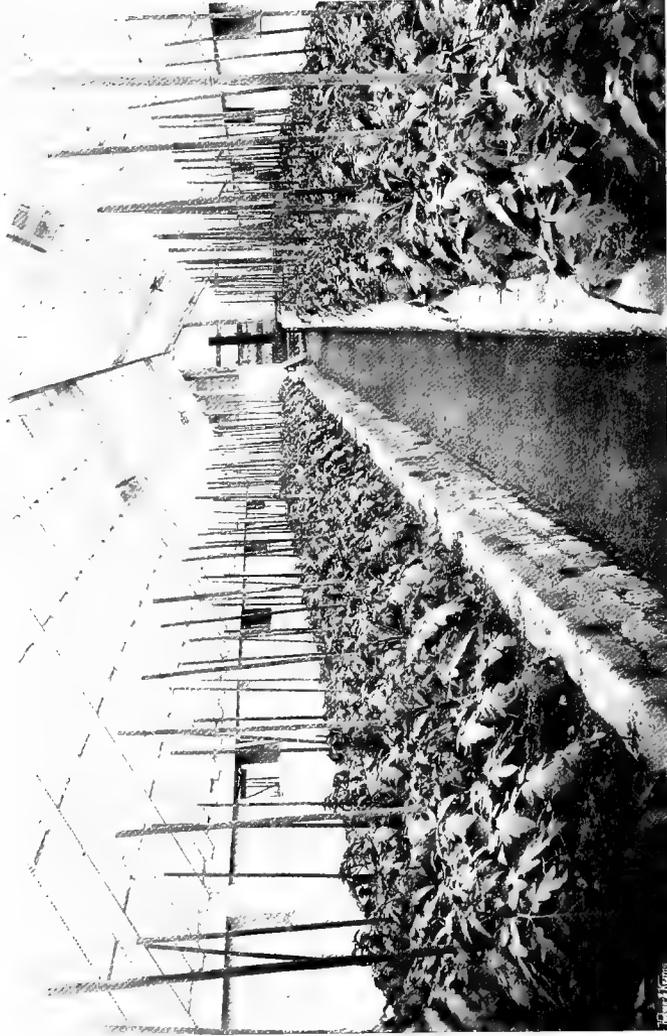
culture, yet it is as true of the tomato as of any other fruit, that if the best results as regards weight of crop, quality of fruit, &c., are to be had, an intimate knowledge of its requirements is essential. The tomato will succeed fairly well in any glass structure, but if new houses are built they should be span-roofed, with the ends facing north and south, and be in an open position where they will be exposed to the sun all day. They may be 10 feet wide, with a 2 feet wide pathway in the middle, and the roof 8 feet high at the apex. They can be built any desired length, but those 200 feet long are convenient. Plenty of ventilation is necessary.

WHEN TO BEGIN.—A convenient day on which to commence the cultivation of the tomato is on New Year's Day. First place two seeds in a 3-inch pot, using loam and leaf-soil in equal proportions, passed through a $\frac{1}{4}$ -inch sieve. After planting, the seeds should be watered with tepid water, and the soil covered with a piece of glass; then place them on a shelf in a warm position in a house whose temperature is, say, 65 degs. Two seeds are placed in the pots in case only one grows (if both grow one should be thrown away). Germination will take place in the course of a week, and before the young plants reach it remove the piece of glass. Keep the seedlings sturdy and strong by giving them a position near the roof. Towards the middle or end of January the small pots will be filled with roots; then the plants should be moved into those of 5-inch diameter, using loam and leaf-soil as before, except that now it should be passed through a 1-inch sieve, with just a little bone dust. Place them deeply in the pots, using enough soil to make the pots only three-parts full, reserving space for a top-dressing later. The plants must be returned to a shelf near the glass in a warm house as before, and left there until they have rooted freely into the new soil. Then they should be removed to a cooler house or pit, and where it is possible to give more air. The young plants should still be kept near the glass, the temperature being from 60 to 65 degs.; the top-dressing previously mentioned may now be applied. Towards the middle or end of February they will have become sturdy plants, and the question must be decided whether they are to bear fruit in pots or in a border. For the first early crop I should prefer pots.

FINAL POTTING.—The size of pot to be used for the final removal should be 12 inches in diameter, and the soil should consist of three parts fibrous loam with one part of fresh horse droppings, add a little bone dust, and mix all well together. The pots should be carefully drained, for large quantities of water will pass through them; they also should be clean. Place the plant rather deeply in the pot in order to allow of top-dressing later, when new roots will be produced from the stem. The house or pit in which the plants are to bear fruit should be made ready, and whether lean-to or span-roofed the best results are obtained early in the year by training the plants to a trellis near the glass roof. Restrict each plant to a single stem; this is effected by cutting out every lateral growth. The stem of the plant need not be more than 4 or 5 feet long, so that if the house is from 8 to 10 feet wide it will accommodate two rows of plants each side, or four rows in a span-roofed house; the pots may be placed quite close together, thus leaving 12 inches.



TOMATO CULTURE IN POTS IN A MARKET NURSERY.



TOMATO CULTURE IN BEDS IN A MARKET NURSERY.

between each plant. The stem may appear rather short ; it is, however, long enough at this early season if care is taken to fertilise every flower which opens. Having repotted the plants into their fruiting pots, and placed them in the house where they are to fruit, endeavour to encourage sturdy growth by the free admission of air. At the same time the temperature of the house should be kept warm enough to bring about the ripening of the fruits as early in spring as possible. From plants grown from seed sown on the 1st of January I have gathered ripe tomatoes in fair quantity towards the end of March. Tomatoes under glass in quantities are produced with most difficulty from early in February to the middle of April. They can be had during this time, but in consequence of growth taking place during the dull winter months, the quality of the fruits is poor as compared with fruits from young plants sown in the New Year. This early crop we have been considering will have ripened, the plants be cleared away, and the house ready for the next crop by the end of May.

SUCCESSIONAL CROPS.—Before we proceed to plant again I would say that where the fruit is required for home consumption only, the question of successional crops and an unbroken supply must have due consideration, and therefore the house in which the plants are grown must be divided into two, or even three, sections, the second being planted from a month to six weeks after the first, and the third the same period after the second. By this means a continued supply is secured throughout the year. As I have said before, tomatoes can be grown in pots in many odd corners of fruit houses, where they will succeed very well. We now have to consider planting the early house the second time, say on the 1st June, and the question arises, shall we grow the summer crop of tomatoes in pots or planted out? I prefer to plant them in a border on the floor of the house. I think a heavier crop of fruit is to be obtained this way with considerably less labour. It is a mistake to suppose that the tomato requires a large amount of soil to root into. The best method is first to place a layer of stable litter and leaves mixed together upon the floor ; this should be about 10 inches or a foot thick when well pressed down. Upon this place a layer of turf, and then the soil (about 9 inches deep) in which the plants are to be planted. It should consist of loam three parts, fresh horse manure one part, with bone dust in the proportion of half a bag to a cartload. To plant a house on the 1st June the plants should be at least 18 inches high, strong and sturdy, with a few fruits set on each. By having strong plants ready for each successive crop, the productive capacity of the house is increased by at least one-fourth. The plants should be put in rows about 15 inches apart, with the same distance between each plant. After planting they should be secured to stakes, or string fastened to a peg in the border, and to the trellis near the roof, and tied to these as they grow. The plants should have a good watering a few hours before they are planted.

GENERAL TREATMENT.—The treatment after planting is very simple, indeed a repetition of that advised in the case of the first crop, that is, to maintain a warm, moist atmosphere, admitting air on all favourable occasions. In watering, take care not to saturate the soil, especially before the border is well

filled with roots. When the plants are in full bearing a mulch of fresh horse manure placed upon the border works wonders in improving the fruits. Manure water (diluted) from the stable-yard, or made with some other fertiliser, should be given at alternate waterings. It is always best, even in the summer, to take the chill off the water before using it. Artificial fertilisation of the flowers is not absolutely necessary to secure a good crop in the summer, yet if the grower can afford the time it will pay him to do so, as the tomatoes, instead of averaging four or five fruits to the bunch, will often have six or seven. A rabbit's tail tied to the end of a stick is the best thing to use for fertilising the flower. Nothing is gained by allowing the plants to become very tall, as only weak growth is made at the top after the plants have been fruiting for some time, therefore when from 5 to 6 feet high they should be stopped. All laterals must be taken off close to the stem. Some growers advocate shortening the main leaves. I prefer to encourage them to a strong and full development except when the fruits are ripening; the foliage may then be thinned out. During the season of growth the atmosphere must be made moist by syringing in the house, but the plants should not be syringed frequently. Planted on June 1, the tomato plants will be exhausted by the first or second week in September, and should be cleared out to make room for another lot, which will be in pots of 12 inches diameter, two plants in each pot.

LATE TOMATOES.—These plants should have been grown in cold pits and have some fruits already formed. They will come into bearing from the middle of October to the end of January. To continue the supply until April when the spring-grown fruits are ripe is more difficult. Seeds must be sown towards the end of August, and the seedlings grown in a cold frame until large enough for removal to the fruiting pots. They must remain in cold frames, or in a sunny position out-of-doors, until frost is likely, then remove them to a temperate house, still giving them plenty of air. They will there make good growth and set their fruits. It is important to have the fruits formed before Christmas, so that when placed in a warm house early in January they will quickly develop and ripen during February, March, and April. Thus we have shown that it is possible to obtain three satisfactory crops of tomatoes from the same house in one year. Some growers prefer autumn-sown plants for the first spring crop instead of those sown on the 1st of January. Seeds are sown in the middle of October, and the seedlings kept through the winter on shelves near the glass in a cool house. These should be potted into fruiting pots on the 1st February. In some seasons they have an advantage over those sown on the 1st January, but not always, and it is well to have a few plants of each.

VARIETIES FOR CULTURE UNDER GLASS

The varieties now in commerce are innumerable, but the few given below may be relied upon as being of the best. Great size in the tomato is no recommendation. Fruits of moderate size are best for all purposes.

Red.—**FROGMORE SELECTED.**—Certainly one of the best both for cropping, appearance, and quality; bright red, often conical in shape. F.C.C. R.H.S.

CHEMIN.—Good in every respect. One of the market growers' favourites. Light red.

COMET.—This variety commands the readiest sale in London markets at the present time. It is of medium size, good appearance, quality, and weight; bright red.

DUKE OF YORK.—A fine exhibition variety; great cropper, but the fruit is rather large for general use.

POLEGATE.—A handsome sort much grown for exhibition. Most desirable, but inclined to become too large.

HAM GREEN FAVOURITE.—A useful, dark red variety. F.C.C. R.H.S.

HACKWOOD PARK PROLIFIC.—One of the earliest and best. F.C.C. R.H.S.

SUTTON'S PERFECTION.—A well-known standard tomato. Excellent in every respect; crimson colour, moderate size. F.C.C. R.H.S.

SUTTON'S DESSERT.—This is a deliciously flavoured tomato; where this fruit is enjoyed as dessert, Sutton's Dessert should be included. F.C.C. R.H.S.

Yellow.—These are not so popular with the public as the red varieties, though they are generally admitted to be of superior flavour, especially when uncooked.

VEITCH'S GOLDEN JUBILEE.—This is one of the most handsome and best; quality, flavour, and cropping properties being excellent. Rich orange tinged sometimes with red; medium size. F.C.C. R.H.S.

SUTTON'S GOLDEN NUGGET.—Very prolific, the fruit produced in clusters of thirty or more. Succeeds well out-of-doors or under glass. F.C.C. R.H.S.

GREENGAGE.—A small golden variety of good quality.

CHISWICK PEACH. A distinct variety of medium size, the colour much resembling that of a peach.

TOMATO CULTURE OUT-OF-DOORS

The cultivation of the tomato in warm positions on walls out-of-doors has been successfully practised in British gardens for a number of years, but its culture in the open garden and the field is still restricted. When better understood, and hardier varieties have been introduced, this will open a field for the development of a profitable industry. It is important to bear in mind that when planted outside the tomato plant occupies the ground but for a very short time, say from early June to the middle of October, only some four months, so that every condition likely to favour rapid growth and maturity must be taken advantage of. The first and one of the most important of these is the position and quality of the land. This should be warm and dry and fully exposed to the sun. It is useless to attempt outdoor tomato culture in heavy, cold soil. The ground should be trenched and heavily manured during the previous winter or spring. It is futile to expect a heavy and well-ripened crop from poor land, and this has been one of the chief causes of failure in the past. Having satisfied ourselves that the condition of the land is in every way suitable, our next duty will be to see that the plants are in the best possible condition for planting when the time arrives for this work to be carried out (early in June). They should be sturdy, not less than $1\frac{1}{2}$ to 2 feet high, and with at least one bunch of fruit already set. Cold frames or pits with a covering of glass are necessary to grow the plants.

PREPARING THE PLANTS.—The seeds should be sown at the end of March in pans or boxes and placed in a warm frame near the glass. If the grower does not possess a frame or house which is artificially heated he should make a small

hot-bed on which to place the frame. This will do well for raising the young plants. As soon as large enough to handle, pot singly into 3-inch pots and replace them in the warm frame, keeping them there until well rooted, say for about a fortnight. Then remove them into a cool frame and give them rather more space. They should still be kept warm even in the frame by giving but little air for some time and closing early in the afternoon. The temperature may rise to 70 or 75 degs. for a few hours. Cover the frame with mats or some other material at night. When the plants are about 5 inches high and have filled their pots with roots they should be potted into 6-inch pots. Use soil consisting of ordinary loam three parts and one part of light manure or leaf mould passed through a $\frac{3}{4}$ -inch sieve, with a sprinkling of lime or soot. They must afterwards be given more room.

CULTURE.—For the first week after the second potting they should be kept fairly warm until the roots have taken hold of the new soil. Then more air must be admitted and the plants grown as hardily as possible, but never allowing the temperature to fall below 40 degs. Towards the end of April and during May the lights may be taken off the frames altogether for a few hours each day when the weather is warm and bright. Towards the end of May the plants ought to be showing flower, and if the frames are wanted for some other purpose, temporary shelter must be provided in some place out-of-doors. This may be made by driving stakes into the ground at distances of 6 feet apart and tying mats to them to form sides, and for a covering nail a lath to the top of the stakes crossways upon which mats can be placed at night. Do not plant in the open quarters too soon, as the tomato is a tender plant; exposure on a frosty night will cripple them for the season. Do not plant out before the 10th to the 16th of June; I have found this to be the best time.

PLANTING.—Plant in rows 2 feet apart, with the same distance from plant to plant, and when the ground is in a suitable condition, neither very wet nor dry. Make the soil firm around each plant by treading. Stout stakes about $4\frac{1}{2}$ feet high should be provided, to which the plants must be secured as they grow. Do not let the stems grow higher than 3 or 4 feet, as fruits which may form above that height will not ripen. The side shoots or laterals should be cut out close to the stem as they appear, so that the whole energy of the plant may be directed towards developing fruit.

AFTER TREATMENT.—A good watering must be given after planting, and the precaution taken to moisten the roots before. It will be difficult to do so thoroughly afterwards. If the weather is dry immediately after planting, water the plants occasionally until they are well rooted. When this is the case a mulching of short manure should be given. The ground must be kept free of weeds by hoeing, the laterals stopped, and occasional waterings given during dry weather. It will take 10,890 plants to plant an imperial acre at 2 feet apart. Each plant should yield 3 lbs. of ripe fruit at a low estimate, and the price per lb. should average 2d., the best would be 3d. or more. This would give a return of £272 per acre, or at least a clear £100 profit after all expenses were paid. I do not know of another crop capable of yielding such a rich return from the land in so short a time.

GATHERING AND PACKING THE FRUIT.—Towards the end of July some of the earliest fruits will show signs of ripening. They must be gathered before they are quite ripe and placed in cold frames (with the lights on) on a dry bottom, one layer deep only, and exposed to the sun. Admit plenty of air. This treatment will greatly improve the quality and colour of the fruits. A week's exposure will be long enough. They will then be in condition for market or home use. The fruits should be sorted into at least two qualities, and towards the end of the season perhaps three, when some of the latest fruits will be of inferior quality and suitable only for the manufacture of sauce. The first quality, which should be of one size and good colour, must be packed separately, and these ought to realise top prices. The second quality, smaller and of less attractive appearance, should bring little less than 2d. per lb. Strong cross-handle baskets, holding from 12 to 20 lbs., are most satisfactory for packing tomatoes in for carriage by road or rail. The fruit should be looked over at least every other day while ripening, and, as I said before, gathered some days before it is ripe. When despatched to market it must be firm and solid, or it will get bruised in transit and its value depreciated.

Where walls or palings are available much better crops can be had ; indeed, I have had as heavy crops from low walls facing south out-of-doors, as I have had from under glass. I believe that the better return from the tomato when planted against a warm wall or fence would soon compensate the grower for the cost of its erection, and prove an excellent investment. When the plants are planted against walls or fences the border must be well manured, and more water given than when they are in the open.

VARIETIES.—These must be limited to the medium-sized ones. *Sutton's Open Air* is one of the hardiest and best for this purpose ; its fruits set well, and grow to a good size. They are, however, slightly corrugated, a fact that somewhat lessens their market value. *Chemin* and *Comet* are both excellent. *Frogmore Prolific* has succeeded well with me in the open, and it is one of the most handsome, and consequently a good one to sell. *Sutton's Early Market* : one of the best for market, and well suited for growing out-of-doors. *Dickson's Early Ruby* : this is a variety that sets its fruit freely, crops heavily, and is of attractive appearance.

GOLDEN VARIETIES.—These are more tender, do not succeed so well out-of-doors, and therefore are not often planted. *Golden Jubilee* is one of the hardiest and best.

ORNAMENTAL FRUITING TOMATOES.—The Red and Yellow Cherry and the Currant are among the best of these. When grown in pots they are very decorative and useful. At the end of the season there will be some small and unripe fruits left. If placed in slight heat they will ripen, or they may be made into sauce or tomato chutney.

TOMATO CULTURE UNDER GLASS FOR MARKET

The culture of the tomato under glass for commercial purposes has now assumed enormous dimensions both in England and in the Channel Islands.

The first thing is to consider how the best results can be produced at the least possible cost. Past experience has shown that this can be brought about best by adopting at least three systems of culture. First, in combination with that of the chrysanthemum ; secondly, with the vine ; and lastly, the culture of the tomato alone. The first system is the most general, and prevails to a large extent among growers of tomatoes for market. Chrysanthemums occupy the houses in winter, and tomatoes in summer.

THE HOUSES.—These may be of various sizes. For summer crops houses 21 feet wide are convenient, and the length may be anything from 100 to 300 feet. The side walls of these houses should be at least 4 feet, and the apices 12 feet high. For early and winter crops smaller houses are best. Those 12 feet wide and 8 feet high at the apex are convenient, and if sunk in the ground a couple of feet, an advantage in the way of warmth will be secured. Winter and spring tomatoes are best grown in pots, and trained to a trellis near the roof. As I said before the question of economy must be well considered, and there is no aspect of the question more important than the houses. To those proposing to embark in this business who are not familiar with the work, let me impress upon them the importance of first visiting a successful grower's establishment, of which there are many within easy reach of London, especially at Finchley on one side, and at Hampton-on-Thames and Twickenham on the other. There they will see the best methods of construction, ventilation, and heating, and also the system of culture in favour among market growers.

POSITION OF THE HOUSES.—The position should be well exposed to the south and west, and protected, if possible, from cold north and east winds by hedges planted not too near the houses. The question of soil is a very important one, when we come to determine where to erect the houses. If the land is not of good quality and fair depth, then its value is much discounted, for if we build houses on poor land money must be spent in providing good soil. The question of drainage is also an important one. If the land is not well drained, this will be the first work to attend to, as without effective drainage successful cultivation is impossible. New houses should be completed early in April ; the grower will then have the season before him in which to grow and market profitable crops before it is time to fill the houses with chrysanthemums for winter.

PREPARING THE SOIL.—If the land on which the houses are built is under turf, this should be taken off 4 inches thick, and carefully stacked in some convenient place. This will be invaluable afterwards. After the turf is taken off, the ground should be bastard-trenched 18 or 24 inches. (In bastard-trenching the subsoil is not brought to the surface, but simply dug up and left in the same position.) Add well-decayed manure. Planting should not be done immediately after trenching ; the land is too soft. When the plants are planted the soil should be moderately dry, and be firmly pressed round the plants with the feet. This is important. If tomatoes are planted in loose soil, partial failure will be sure to follow. The floor of the house should be planted ; the only paths will be those between the rows.

PLANTING.—The usual practice in large houses is to plant a double row of

plants, the rows and the plants being 1 foot apart; a space of 2 feet is left between the next double row. Thus throughout the houses there are double rows of plants with a 2 feet wide pathway between. About as many plants are used as if they were planted 18 inches apart all through the house, but the above method provides for more convenient working. We will suppose that the house is ready for planting the last week in April, that the plants are from 12 to 18 inches high, strong and sturdy, and with the first fruits formed. For the production of these plants seeds should be sown early in January. The number of plants to be grown will be governed by the number and extent of the houses to be planted. As soon as planting is over each plant should be staked or attached to upright strings. If the plants then receive a good soaking of water, they will not give much trouble for some time. Little or no fire heat will be required in the daytime, but at night the temperature should not fall below 55 degs. On bright sunny days air may be admitted freely, consistent with maintaining an atmosphere of from 65 to 70 degs. in the middle of the day. Exercise care not to over-water the plants at any time, but especially so immediately after planting.

GENERAL TREATMENT.—When a good set of fruit is secured and the border filled with roots, then water must be given in more abundance and manure water at every other application. Liquid manure from the farmyard is the best stimulant to use, but frequently this is difficult to procure, and a substitute must be found in some artificial manure of good repute. Until plenty of fruits are formed, air must be liberally admitted, and in order that every flower that opens should be converted into a fruit, let the grower go over the plants at midday with a rabbit's tail, and draw it over each flower. He will find the crop much improved by assisting fertilisation. When the fruits are formed the temperature of the house may be raised, especially in the afternoon after closing. When the air is moist after a liberal syringing, 80 or 85 degs. for an hour or two will be none too high. At least twice a week cut off lateral shoots, restricting the plants to one stem only. When the plants have been bearing some time and a good portion of the crop is gathered, a top-dressing of rich soil will much help to strengthen the plants and prolong their fertility. By the end of the summer the plants will be 8 or 9 feet high. They should then be stopped, for any fruit which might afterwards form would not be worth waiting for; rather let the grower do his best to assist those already "set" by the time the house is wanted for chrysanthemums—towards the end of September. How many pounds of fruit a tomato plant is capable of producing in the course of a season is difficult to say, and would scarcely be answered by two growers alike. Upwards of 20 lbs. per plant have occasionally been reported, but this is quite exceptional, and if the grower can average 8 lbs. he should be well satisfied. If the price averages 2½d. per lb. for the season, the return from each plant (at 18 inches apart) would be 1s. 8d.; and as an acre of land takes nearly 20,000 plants at this distance, the curious can easily find out for themselves the return to be expected from an acre of land covered with glass.

TOMATO CULTURE IN THE VINERY.—It is when vineries are newly planted

that the tomato is useful in providing cash returns for the first two or three years before the vines prove remunerative. The inside vine border may be planted with tomatoes, say at $1\frac{1}{2}$ to 2 feet apart, the first week in May, and the treatment necessary for the successful culture of the young vines after this time will suit the tomato plants admirably, and when the growth of the vine is completed for the season, and the vinery is kept open night and day, then also will the tomatoes be over for the summer season. The aid of the tomato in the vinery will be requisitioned again in the same way the second year, and in a less degree the third year also; after then the vines will monopolise both borders and roof.

HOUSES DEVOTED ENTIRELY TO THE TOMATO.—Where it is desired to have English-grown tomatoes all the year round, a small house of the dimensions of the one mentioned at first should be provided, and divided into three sections with ample provision for artificial heating. Instructions how to succeed in maintaining a succession all the year round need not be repeated here, as they have been fully given. The supplies of tomatoes during winter and early spring from the Canary Islands and other sources are so plentiful that it is hopeless for the English grower to compete at those seasons with the least prospect of success. One of our largest growers assured me that if he could be sure of securing 4s. per lb. he would not be tempted to embark upon the hazardous business of growing tomatoes for winter and early spring, when crops would be light and fuel dear, so that as a commercial undertaking this aspect of the question is not worth further consideration.

TOMATOES IN POTS.—Many growers find a remunerative market for ripe tomatoes during May and early June. The quality of the English-grown fruit is so much superior to the imported article that it fetches a better price, and recoups the grower for the extra expense entailed in its production at this comparatively early season. Plants intended to furnish these crops are obtained by sowing the seed early in October and growing the seedlings in an intermediate temperature through the autumn and winter, taking care to fertilise every flower as it appears. Towards the end of February or the first week in March they should be transferred into their fruiting pots (12-inch) and trained up the roof. If care is taken to fertilise the flowers as they open, a prolific and profitable crop will be the result.

Wire-worms are often very troublesome. The best way to get rid of them is by distributing pieces of carrot over the ground. Wire-worms are very fond of these, and collect upon them in large numbers; they are then easily destroyed by burning. Of varieties, *Chemin Rouge* and *Comet* are the two best for market culture. To secure the best fruit save your own seed from the finest tomatoes grown during the season, bearing in mind that the fruit should be heavy, of medium size, regular form, and attractive colour.

TOMATO CULTURE UNDER GLASS WITHOUT FIRE HEAT.—In the Islands of Guernsey and Jersey acres of glass are devoted to tomato culture with no artificial heat, but the conditions there are more favourable to this method than is the case in Britain. Still, this system is carried out on a large scale in some districts near London. I have visited one where twenty houses, covering ten

acres of land, are planted with tomatoes. Each house covers half-an-acre of land, ten of them are heated with hot water, and ten not heated at all. Both the heated and unheated houses produce two crops a year; the heated ones producing two crops of tomatoes, and the unheated ones one crop of tomatoes and one of cabbages. It will be news to many readers, I have no doubt, to hear that cabbages are grown under glass by the acre in England.

The system of culture is as follows:—Early in October the cool houses are planted with cabbages raised from seed sown the first week of the previous August, the land being manured and dug in the ordinary way. Little or no attention is necessary until cutting commences early in April, continuing until May, when all the crop has been disposed of.

Immediately the cabbages are disposed of, trenches are dug out 4 feet apart and 18 inches wide, into which some new soil and a moderate dressing of manure are placed, digging all together some time before planting. A double row of plants, at 10 inches apart, is planted in the trench. When the plants have established themselves and are well furnished with fruits, the ridge between the trenches may be levelled into these as a top-dressing for the plants. Heavy crops of fruit are secured in this way at comparatively small cost—watering, collecting, and marketing the fruit being the chief items of labour. In December the tomatoes will be almost over, and it will be time again to plant the cabbages. The reason for adopting the plan of growing in trenches is that deep digging and a change of soil for the crop are thereby assured; the ground that forms the trenches one year will form the ridges next, and so on. The stronger the plants when planted out at the end of April and early in May, the better will be the result. Seeds are sown the last week in January. *Comet* is the only variety grown at the establishment in question.

The method adopted in the ten houses, covering 5 acres, which are heated is different. Here, all the plants are grown in pots, the first fruits ripening from April until June. The pots are then filled with other strong young plants, and they in their turn will yield heavy and remunerative crops until late in the autumn or early winter, when it is no longer remunerative to grow English tomatoes because of the heavy importations of fruit from abroad. Seed for the earliest crop is sown the last week in October, the plants are grown during the winter in 5 or 6-inch pots, and placed in their fruiting pots (12-inch) about the middle of February. The seeds for supplying the second lot (to be planted at the end of June) should be sown the first week in April. The plants are all grown on the single-stem system, and stopped when 4 feet high. The reason for this is that the best fruit is formed on the lower part of the stem.

SOIL DIFFICULTIES.—When the same crop is cultivated continuously upon a limited area of land, it is not surprising that growers are, before long, confronted with soil sickness, and as a consequence the plants show diminished vitality, are liable to disease, and therefore unremunerative; thus we see the advantage of the pot system of culture, when fresh soil can be given to each plant. Two heavy crops during the summer may also be had from pot plants, and this cannot be easily accomplished under the planting-out system.

HOW TO SECURE A SUPPLY OF WATER.—An abundant supply of water is most essential to successful tomato culture under glass. An economical method is to build a tank at the lower end of the block of houses into which all the rain which falls on the roofs may drain. A tower must be built (on which to fix the tank), high enough to give the necessary pressure for expeditious watering. A pump worked by hand, or by whatever power decided on (this will depend on the size of the establishment), would have to be fixed for pumping the water to the top of the tower. It need scarcely be said how much better in every way, and how much more conducive to the success of garden crops of all sorts, is rain than spring water. Therefore, means should be provided to save all that falls upon the roofs. When this supply is inadequate, and no other source available, a well must be sunk.

TOMATO, THE TREE (see p. 212).

CHAPTER XVIII

TROPICAL FRUITS AND HOW TO GROW THEM

By W. WATSON

In this chapter it is proposed to call attention to certain fruits of recognised value in tropical countries, but which have not hitherto found much favour with cultivators in this country, although their management is well within the means of the grower of forced peaches, grapes, melons, pineapples, figs, &c. Such plants as the mangosteen and durian, two of the most famous of tropical fruit trees, are omitted, because they are practically beyond our skill. A well-finished house of mangoes, custard apples, bananas, or oranges would surely be as creditable and useful as some of the fruits that are grown now. The expense incurred in the production of fruits and flowers is not always a primary consideration. Many of those we grow could be bought for less than it costs to produce them at home. There is, however, the satisfaction, one might say pride, of accomplishing some difficult feat of cultivation, which is sufficient reward, and it is this spirit that enables English horticulturists to overcome difficulties which would probably deter those influenced only by considerations of profit and loss.

THE CITRUS FAMILY

The genus *Citrus* comprises seven species, three of which yield fruits of commercial value, namely *C. medica*, forms of which are known as the citron, the lemon, and the lime; *C. decumana*, the shaddock, pumelo or grape fruit; and *C. Aurantium*, the type of all the oranges proper. Although found either wild or cultivated in most tropical and sub-tropical regions, the various forms of *Citrus* had, according to Sir Joseph Hooker, an Eastern origin, and the forefathers of the orange, the lemon, and the lime may be found in the hot valleys of the Himalaya, of the mountainous districts of Eastern Bengal, and of the Deccan. The cultivation of oranges and lemons is now an enormous industry in countries both west and east. It would therefore be absurd to recommend their production in Britain as sources of profit, although they can be grown to perfection at no greater an outlay than is required to grow first-class forced peaches.

The lemon, orange, and less commonly the shaddock are grown sometimes as decorative plants, their fruits being allowed to remain on the trees as long as they will hang, by which time they are dry and unpalatable. But cultivators at home have shown that English-grown oranges are superb as dessert fruits.

The value of the flowers, which are always in demand for weddings, is also an item that deserves passing mention. The varieties worth cultivating for their fruits are :—

ORANGES

BLOOD OR MALTA.—*Fruit* large, with a thin and rather smooth skin ; *pulp* stained with crimson, very juicy and sweet.

ST. MICHAEL'S.—This is the most commonly cultivated for market, and it varies in quality according to the conditions under which it is grown and the variety. The best forms are known as Exquisite, Dulcissima, Silver Sustain, and Egg.

TANGERINE.—*Fruit* small, compressed ; *skin* easily removed and peculiarly aromatic ; *pulp* juicy and very sweet. All the forms of this are excellent, one of the best being that known as St. Michael's.

NAVEL.—*Fruit* large, egg-shaped, with a nipple-like projection at one end ; *skin* thin ; *pulp* pale in colour, very juicy and sweet.

JAFFA.—*Fruit* large ; *skin* generally thick ; *pulp* juicy, and when the fruits have been left long enough to mature before being gathered, pleasantly sweet.

SEVILLE.—*Fruit* large ; *skin* thick ; *pulp* acid and not sweet. Grown for the manufacture of marmalade. A free-flowering variety.

LEMONS

BIJOU.—*Fruit* small, globose, juicy, aromatic, slightly bitter as well as acid ; tree dwarf and fruitful. Seems to be intermediate between the lemon and the lime.

IMPERIAL.—*Fruit* large, juicy, aromatic ; tree vigorous and free.

SWEET OR BRAZILIAN.—Remarkable in being almost devoid of the acidity characteristic of lemons.

METFORD'S.—*Fruit* as large as an ostrich's egg ; *skin* smooth, pale yellow ; *pulp* juicy and superior. An excellent lemon for culinary purposes ; in the size of the leaf, flowers, and fruit it resembles a shaddock, but it is a true lemon.

LIME.—The true lime is a thorny shrub with ovate leaves, white flowers, small, nearly globose, yellow fruit with thin skin, and an abundance of pure acid juice. It is largely grown in the West Indies, and is the principal source of citric acid, so largely employed for flavouring and as a summer beverage. The best forms are known as bitter, sweet, and Persian.

SHADDOCK.—This is also known as the forbidden fruit, pumelo or pomalo, and grape fruit. The largest fruited forms are sturdy trees, with large leathery leaves, very thick petalled flowers, and oblong fruit as large as an ostrich's egg, or nearly globose ; *skin* thick and rather coarse ; *flesh* in coarse, bladder-like grains, pale, watery, and lacking both sweetness and acidity. The variety known as grape fruit is about the size of a swan's egg, has smooth *skin*, and the *flesh* is slightly bitter and aromatic. It is largely eaten in the United States as a morning tonic.

CULTIVATION.—As in the case of apples and other cultivated fruits, the forms of oranges and lemons cannot be relied upon to come true from seeds. Grafted plants must therefore be secured. They may be grown in pots or tubs of about the same proportions in relation to the plants as camellias, or they may be planted out in a border exactly as for peaches or vines. In either case they prefer good fibrous loam, which should be periodically enriched with top-dressings of manure—preferably sheep or deer dung—applied in March. When in growth they require plenty of moisture both at the root and overhead ; while resting in winter the soil should be kept just moist. Plants wintered in a low temperature will not require any water from about November till March. Where a house can be devoted entirely to the cultivation of oranges it should



THE NAVEL ORANGE (CITRUS AURANTIUM VAR.). (Natural size)



THE CUSTARD APPLE (*ANONNA MURICATA*). (Natural size.)

be spacious, well glazed, and ventilated as for forced peaches. The border should occupy the whole area and be deep, well drained, with about 2 feet of good loamy soil. In this the trees can be planted at suitable distances apart and treated as ordinary orchard-house trees. Fan-trained trees may occupy the sides or walls of the house.

The trees require careful pruning so as to obtain short sturdy wood and an open form of tree, better results being thus obtained than from trees allowed to grow dense. Strong woody shoots, if not required to build up the framework of the tree, should be cut out, or, better still, they should be stopped early to prevent waste.

Oranges require all the sunshine they can get. It is a good plan to start the house early, say the first week in March, by maintaining a temperature of from 50 to 70 degs., the latter with sun-heat; from May onwards the temperature may be 10 or 15 degs. higher than this. A good syringing twice a day should be given. The plants must be kept free of insects, and with this object some growers syringe them once a week with a weak solution of paraffin.

If the plants are grown in pots or tubs they require the same treatment as those planted out, but of course close attention must be given to the condition of the soil. Half-inch bones and old mortar mixed with the soil serve to keep the latter open and also afford nourishment. Plants that have grown too large or become leggy and unsightly may be reduced and renovated by cutting them back in the spring and keeping them close and moist for a few weeks. This induces them to break freely.

CUSTARD APPLE

The custard apple is the fruit of *Anona squamosa*, a magnolia-like bush or small tree about 15 feet high, copiously branched, and clothed with leathery oblong leaves, glaucous beneath, in the axils of which are borne in spring solitary greenish fleshy flowers about 1 inch across. The fruit is egg-shaped, 3 inches or 4 inches long, and is composed of a number of scale-like ovaries, which are confluent and form a fruit suggestive of a globe artichoke or a pinecone. When ripe it is fleshy, the pulp yellowish, and so soft that it is difficult to handle a ripe fruit without squashing it. The flavour has been likened to that of raspberries and cream. In tropical countries the custard apple is a favourite fruit. Although originally from tropical America, it is now wild or cultivated in both hemispheres. In India it ranks with the mango as a cultivated fruit, ripening in May. Imported fruits must necessarily be gathered long before they are ripe. The trees are propagated from seeds, and they grow so rapidly that they begin to fruit when about three years old.

There is a tradition in India that the god Ram and his wife Sita decided each to create a fruit that should excel all others. Ram produced the Ramphal (*phal*=fruit), or bullock's heart (*Anona reticulata*), and Sita the Sitaphal, or custard apple (*A. squamosa*). The former is not considered palatable by Europeans, although it is eaten by the natives. In the West Indies another

species (*A. reticulata*) is called the custard apple, while *A. squamosa* is known as the sweet-sop.

Custard apple, or sweet-sop, is a fruit of first-rate quality for dessert, and one that can only be obtained in anything like perfection in this country from home-grown trees. It has been successfully fruited in a few gardens here, but only casually. There is, therefore, an excellent opportunity for some enthusiast to distinguish himself by devoting a house to its cultivation. There is no doubt that it can be done successfully, because plants grown in pots under ordinary stove treatment and without any particular attention, flower annually, and now and then ripen fruits. House, soil, and conditions generally ought to be the same as for forced peaches. Bullock's heart has long smooth leaves, flowers two or three together, and sub-globose fruit with a rough exterior. It is not worth growing except by the curious, but care must be observed that it is not taken in error for the custard apple, as it bears this name in the West Indies.

A. Cherimolia (the cherimoya) has small ovate fruits, which are eaten by Creoles, and are good enough to find favour with some Europeans. Fruits produced a year or two ago in the palm-house at Kew were delicious in flavour. *A. muricata* (the sour-sop), has large green prickly fruit of medicinal value only.

PERSIMMON, OR DATE-PLUM

Diospyros Kaki, the persimmon, or date-plum, is an Eastern tree which for centuries has been cultivated in China and Japan for its fruits. It is scarcely known in English gardens, although it has been cultivated for many years in Southern Europe. It forms a bushy tree, very similar to the apple, and is deciduous; the leaves are oblong, rather leathery, and about 5 inches long; they assume brilliant colours in autumn. The flowers (female) are green, an inch in diameter, and are borne singly in the axils of the leaves. The fruits ripen in late autumn, and remain long on the tree after the leaves have fallen. They vary in size and flavour almost as much as apples; in colour they are usually bright scarlet. The male and female flowers are borne on separate plants, and the varieties are propagated by grafting. Most, if not all, the cultivated plants we have are females. The ovaries swell to full size without having been fertilised, but the fruits are seedless. Fruits matured in a sunny greenhouse at Kew were as large as a Ribston Pippin apple, and when ripe were as red, soft, and juicy as a ripe tomato.

It would appear that the conditions most suitable for the persimmon are what we term sub-tropical. It is not likely to be hardy anywhere in England, except in the warmer parts, although fruits have been ripened on a plant grown against a wall in Canon Ellacombe's garden at Bitton. So far as Kew experiments have gone, the conditions most congenial to this plant are those of the agave house. Here it is planted out in a border of loamy soil in a position where it gets plenty of summer sunshine and air, while in winter the atmosphere is dry and the temperature never below 50 degs. The pruning of this plant is identical with that recommended for peaches. In Japan the trees are

never pruned with a knife, the belief being that iron causes injury to the branches; they are therefore thinned by breaking with the hand. The soil most suitable for the persimmon is loam, and a top-dressing of manure should be given annually, say in March. Night soil is used in Japan for this purpose.

Professor Sargent, in his "Forest Flora of Japan" (1893), says: "The persimmon is planted everywhere in the neighbourhood of houses, which, in the interior of the main island, are often embowered in small groves of this handsome tree. In shape it resembles a well-grown apple tree, with a straight trunk, spreading branches which droop toward the extremities and form a compact round head. Trees 30 to 40 feet high are often seen, and in the autumn when they are covered with fruit, and the leaves have turned to the colour of old Spanish red leather, they are exceedingly handsome.

"Perhaps there is no tree, except the orange, which as a fruit tree is so beautiful as the Kaki. In Central and Northern Japan the variety which produces large, orange-coloured, ovate, thick-skinned fruit is the only one planted, and the cultivation of the red-fruited varieties with which we have become acquainted in this country is confined to the south. A hundred varieties of Kaki at least are now recognised and named by Japanese gardeners, but few of them are important commercially in any part of the country which we visited, and, except in Kyoto, where red Kakis appeared, the only form I saw exposed for sale was the orange-coloured variety, which, fresh and dried, is consumed in immense quantities by the Japanese, who eat it, as they do all their fruits, before it is ripe, and while it has the texture and consistency of a paving-stone!

"*Diospyros Kaki* is hardy in Pekin, with a climate similar to that of New England, and fully as trying to plant-life; it fruits in Southern Yezo, and decorates every garden in the elevated provinces of Central Japan, where the winter climate is intensely cold. There appears, therefore, to be no reason why it should not flourish in New England, if plants of a northern race can be obtained; and, so far as climate is concerned, the tree, which in the central mountain districts of Hondo covers itself with fruit year after year, will certainly succeed in all our Alleghany region from Pennsylvania southward. In this country (United States) we have considered the Kaki a tender plant, unable to survive outside the region where the orange flourishes. This is true of the southern varieties which have been brought to this country, and which may have originated in a milder climate than southern Japan, for the Kaki is a plant of wide distribution, either natural or through cultivation in south-eastern Asia. But the northern Kaki, the tree of Pekin and the gardens of central Japan, has probably not yet been tried in this country. If it succeeds in the northern and middle states it will give us a handsome new fruit of good quality, easily and cheaply raised, of first-rate shipping quality when fresh, valuable when dried, and an ornamental tree of extraordinary interest and beauty."

The names of the varieties are Japanese. The following is a selection:—

HACHIYA.—Produced at Hachiya, in the province of Mino. *Fruit* very large, oblong, pointed, a little flattened at the base; *skin* rich red, black at the end when quite ripe; *flesh* when bletted juicy, very rich, delicious in flavour.

KO-TSURU.—*Fruit* small, oblong, pointed at the end, orange-yellow. It begins to ripen early in August, but is not quite ripe till September. Inferior in quality, yet is esteemed for earliness.

KUMOSU-MARU.—*Fruit* medium size; *skin* yellowish-orange, black cobweb-like mark appearing on the apex when quite ripe; *flesh* rich in flavour. Ripens from the middle to the end of November.

SHIMO-MARU.—*Fruit* roundish-oblong, somewhat four-sided. It loses its astringent property early in September and changes to a yellowish colour, ripening entirely after exposure to frost and changing to reddish-orange. *Flesh* juicy, crisp, and of excellent quality.

TSUNO-MAGARI.—*Fruit* roundish, pointed, somewhat four-sided at the stem; *skin* light reddish yellow; seedless. It retains its astringency even when quite ripe.

TSURU-NO-KO.—*Fruit* medium, oblong, pointed, bright red with black marks on the apex when quite ripe; *flesh* dull red, spotted with purplish black dots, sweet, rich in flavour. Ripens in October.

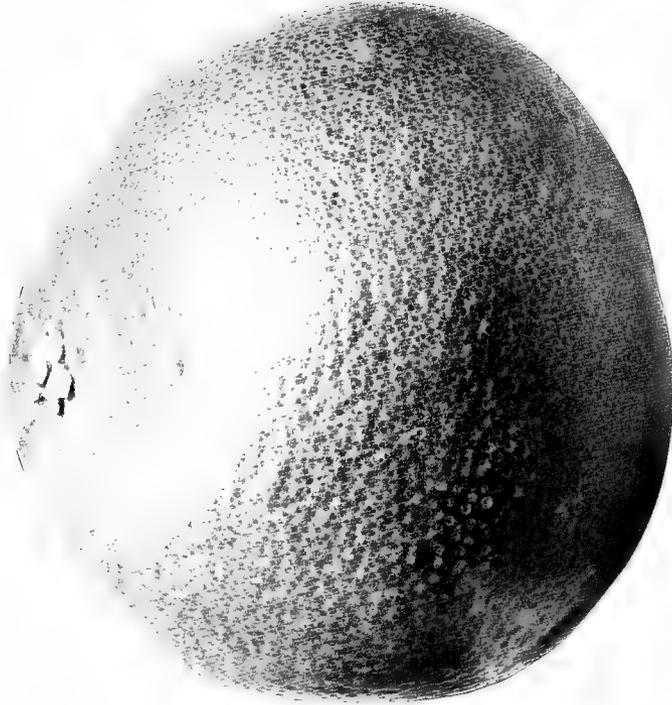
MANGO

The mango (*Mangifera indica*) is, *par excellence*, the fruit of the tropics. Originally a native of India, it has become widely distributed wherever the conditions are suitable. It has been termed the peach of the tropics, and the descriptions given of first-rate mango fruits by those who have tasted them make one's mouth water. All attempts to import ripe mangoes into England have so far failed. To enjoy them we must therefore either go to the tropics or master their cultivation at home. I have never heard of any serious effort to grow mangoes in this country. It is true that fruits have been produced on plants cultivated at Kew and in several other gardens, but they satisfied no one. The tree grows to a large size—"trunks 30 to 40 feet high and 10 to 15 feet in circumference"—but it may be kept much smaller than this. The plant which fruits at Kew is only some 8 feet high. It appears to require the same treatment as an apple or pear, except that the temperature must be tropical, or at least sub-tropical. It likes manure, plenty of it, and a loamy, deep soil. According to Woodrow, in whose book, "Gardening in India," there is an excellent account of the mango, bones in any form are good for the trees, and an annual dressing of salt, as much as 10 lbs. to each big tree, is given in October or November to encourage the formation of flower-buds.

There are many varieties, as many as of apples, according to Woodrow, and they are as different in size, flavour, and value. The best are excellent. They are all grafted, a seedling mango being of as doubtful merit as a seedling apple. The best sorts recommended by Woodrow are Alphonse, Pirie, Pakria, Punhala, Borsha, Mulgoba, Banchure, and Massarata. In addition to these, he recommends and enumerates many other varieties. His description of Alphonse is worth quoting: "Universally admitted to be the finest of all mangoes. In flavour its fruit is indescribable; it seems to be a subtle blending of all agreeable flavours. In weight it averages 8 ounces; its colour is green, with a rich crimson glow on the exposed side; its shape is oblong, thickened at the upper end without any stigmatic point or beak. The variety is to be recognised when not in fruit by the bright red midrib of its leaves. The tree is stunted or irregular, rarely forming a shapely specimen."



A BUNCH OF MANGOES. (Average size of Fruit $3\frac{1}{2}$ by 3 inches.)



THE GRAPE FRUIT (*CITRUS DECUMANA* VAR.). (Natural size)

Plants of the best mangoes can be purchased in India for about 2s. each, and they are easily sent to England in a Wardian case, as has been recently shown by the collections obtained for Trinidad from Calcutta, and which were transported *via* Kew. The cost of a house suitable for their cultivation would not be greater than that of a large peach-house or vinery, and the labour of cultivation certainly no more than that of forced peaches. A house filled with mangoes in fruit would be highly creditable, especially as it might be the means of adding to the list of English dessert fruits another which in flavour and quality is unlike any fruit we have.

BANANA

Bananas are largely consumed by the inhabitants of tropical countries, being excellent food. They are also now a popular article of food in temperate countries, large quantities of them being imported all the year round from the West Indies and the Canary Islands for consumption in the British Islands. They are cheap, conveniently portable, and so wholesome that they will soon rival, if they do not surpass, the orange and even the apple for general use among all classes.

The imported banana, from the fact that it has to be cut before it is ripe, and for other reasons, is necessarily inferior in quality to fruit that has been allowed to mature on the plant. Consequently high-class bananas can only be obtained in this country from home-grown plants. A good banana is one of the most enjoyable of fruits. At Kew and in a few other large gardens in England where they can be conveniently cultivated they are grown to perfection. There are numerous varieties, varying in size from 9 inches in length by 3 inches in diameter to dainty little thin-skinned fruits no bigger than a man's thumb. They are either angular or smooth and regular, their colour is either yellow or russet-red, and their flesh resembles that of a ripe apricot in colour and mellowness or is pale yellow and less juicy. Some sorts are said to be of a bright green colour when ripe. There are about forty species of *Musa*, only few of which have edible fruits, the best of these being *M. sapientum*, of which there are many varieties, and *M. Cavendishii* or *chinensis*, the Chinese banana. The plantain is distinguished only by having fruits that require cooking to be palatable. The best of those tried at Kew are Champa, Medji, Raja, Ramkela, Guindy, Arracan, Martaban, and Ladies' Finger. Other sorts have recently been obtained from the Malay Archipelago and are being tested at Kew and also in the West Indies. The Chinese banana is the principal variety grown in the Canary Islands; it is also a favourite with English cultivators, because of its comparatively dwarf stature and the enormous size of its bunch of fruits, weighing nearly a hundredweight and bearing about two hundred and fifty "fingers" (fruits). Such a bunch may be developed in a house not more than 10 feet high. Each stem produces one bunch of fruit and then dies, to be succeeded by several other stems from the same root-stock. It is not advisable to allow more than one stem to each stool, the others may be removed and grown singly in pots or tubs. The bunches should be cut when the fruits begin to change colour and hung in a warm room to ripen. They are at their

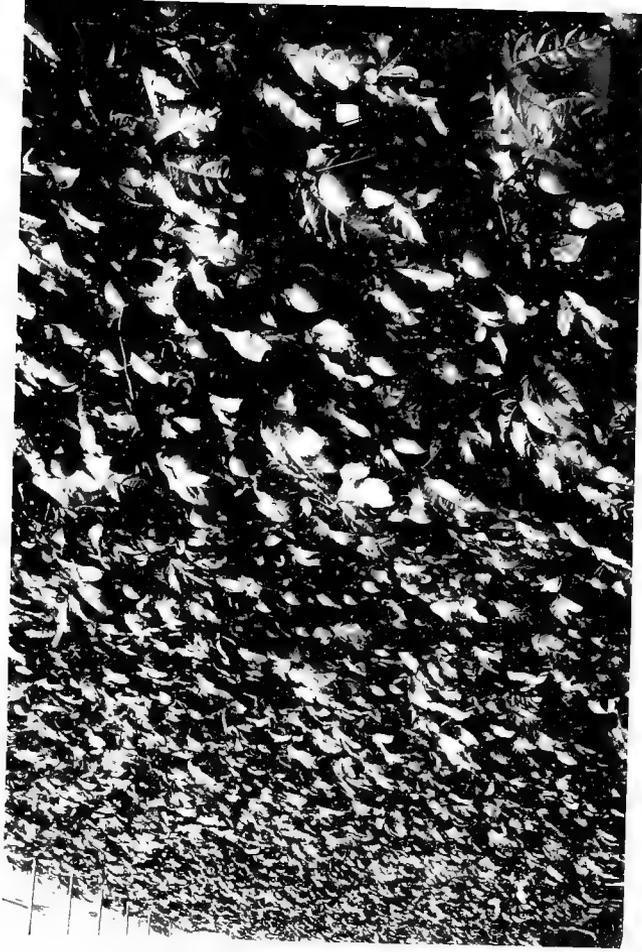
best when fairly soft to the touch. First-rate results may be had from plants grown in large pots or tubs. The root-system of a *Musa* is large, and therefore a liberal allowance of root-space is necessary. They like a strong loamy soil and liberal supplies of manure. All the forms of *M. sapientum* require a tropical temperature; the Chinese banana may be grown in an intermediate temperature, but it is at its best only in a house where the winter temperature does not fall below 60 degs. and in summer not lower than 70 degs. If a border can be afforded for *Musas* it should be at least 3 feet deep, and contain 2 feet of rich soil on 1 foot of drainage. The soil should be renewed for every fresh plantation. *Musas* enjoy plenty of sunshine and a liberal supply of water at all times.

TREE TOMATO

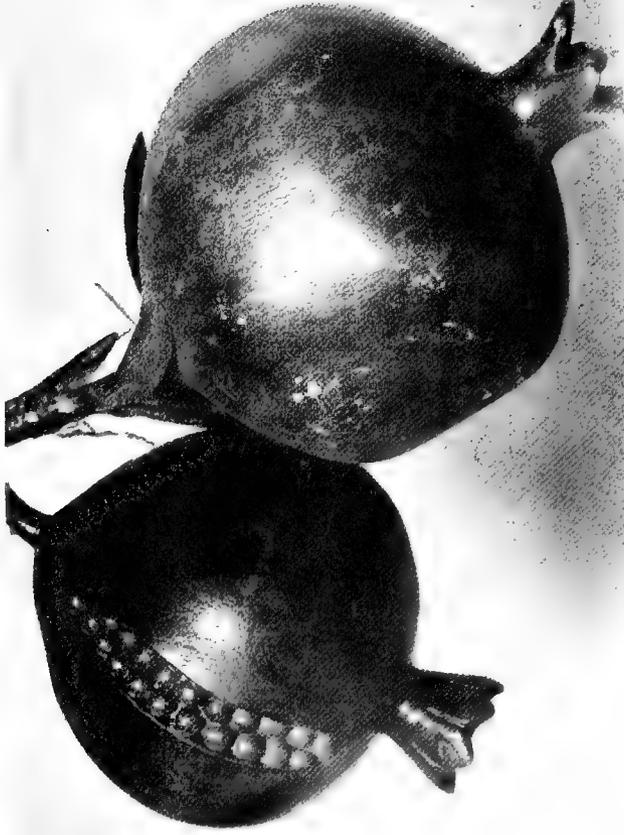
A *Solanum*-like plant, *Cyphomandra betacea*, which has become popular in some tropical and sub-tropical countries where the fruits are eaten raw or made into a conserve. It is a native of Peru, where it is known as *Tomato de la Pas*. The fruits are sometimes offered for sale by London dealers. As with the tomato proper, a liking for the tree tomato has to be acquired. They are really palatable and refreshing to those who have learnt to appreciate them. Their flavour is that of the sweet-cup (*Passiflora edulis*) with a suspicion of raw potato added. The plant grows readily from seeds, and if planted in a warm house in good loam it forms in about two years a big herbaceous shrub not unlike a *Datura*, copiously branched, and bearing pendent clusters of egg-shaped orange-yellow fruits $2\frac{1}{2}$ inches long; the thick leathery rind encloses a soft pulp, which can be easily sucked or squeezed into the mouth. Several hundreds of fruits are borne by a single plant. They keep well, and no doubt would travel easily. With regard to this plant we have yet to teach English fruit-eaters that it deserves a place among dessert fruits. In hot weather it is decidedly refreshing. Twenty years ago it was difficult to get many people to eat tomatoes, and most of those who did partook of them only in a cooked state. It is very different now. In tropical countries the tree tomato is rapidly growing in popularity.

POMEGRANATE

Fruits are rarely produced by the pomegranate (*Punica Granatum*) in England, where it is grown only as an attractive flowering shrub; but in countries where the sun has more power it fruits as freely as the apple does with us. It has been cultivated by man from an early period, being frequently mentioned in the Bible. It is wild in Cabul and Persia, and is cultivated throughout the warmer regions of the globe. The best varieties are propagated by grafting. Seedlings should only be used as stocks for the several first-rate varieties which bear fruits containing plenty of pulp. There is a seedless variety known to Indian cultivators. Captain Burton, in his "Pilgrimage to El Medina and Mecca," describes three which he met with in Arabia: "The best is Shâmi; it is red outside and very sweet, almost stoneless, like a muscat



THE EDIBLE PASSION FLOWER (*PASSIFLORA EDULIS*) IN FRUIT UNDER
GLASS.



THE POMEGRANATE (*PUNICA GRANATUM*). (About two-thirds natural size.)

grape, deliciously perfumed, and as large as an infant's head. Turki is large and of a white colour. Misri has a greenish rind and a somewhat sub-acid and harsh flavour." This fruit is worthy the attention of the English fruit specialist. It is not difficult to picture a light house with a southern aspect filled with pomegranates trained as espaliers close to the glass in the same manner as peach trees are. They would certainly flower freely, as they do against a south wall outside, and if, by a little skilful manipulation, a good set of fruit could be obtained, they would, when ripe, be a "beautiful picture of bright green leaves and solid crimson fruit of the richest hue and most admirable shape." A good pomegranate is good eating, but a seedless one is much to be preferred to those one usually gets from the shops, which have been compared to a bag of moistened shot. Canon Ellacombe states that in 1876 he counted more than sixty ripe fruits on a pomegranate at Bath, which demonstrates that sunshine sufficient to mature the fruit can be obtained in some parts of these islands at any rate.

PASSION FLOWER FRUIT

Several species of *Passiflora* bear edible fruits. The granadilla is perhaps the most commendable, although the sweet-cup (*P. edulis*) is more frequently cultivated in this country. The name granadilla has been applied to the fruits of no less than three distinct species, closely allied no doubt, but still botanically distinct. These are *P. alata*, *P. quadrangularis*, and *P. macrocarpa*. They have angular, winged stems, large, entire ovate leaves, and large, egg-shaped edible fruits, considered by some highly delectable, by others not worth eating. The largest is *P. macrocarpa*, with fruits the size and shape of an ordinary melon or an ostrich's egg. *P. quadrangularis* and *P. alata* have fruits about half this size. All three flower and fruit freely under stove treatment. The fruits have a thick rind enclosing a mass of the most deliciously flavoured jelly-like pulp, and numerous small black seeds. It may be made into a conserve of a particularly pleasing quality.

P. edulis (the Sweet-Cup) is not uncommon as a stove climber in English gardens. It has trilobed leaves and smooth purple fruits the size of bantam's eggs; when ripe they have a hard rind and an almost liquid pulp of pleasing flavour. The best way to eat them is as one takes a boiled egg—that is, cut off one end and consume the contents with a spoon, adding a few drops of port wine instead of salt.

P. maliformis (the Golden Apple) has ovate, entire leaves, and fruits like small apples.

P. laurifolia (the Water Lemon) also has ovate, entire leaves, and fruits of the same quality as *P. edulis*, but larger. Mr. Abraham Dixon, of Cherkley Court, Leatherhead, informs me that the only way to get this species to set fruits in this country is by fertilising its flowers with pollen from *P. raddiana* (*kermesina*). He has grown it many years for the sake of its delicious fruits obtained in this way. The cultivation of these *Passifloras* presents no difficulty. They are stove climbers, with a liking for an open loamy soil and plenty of moisture.

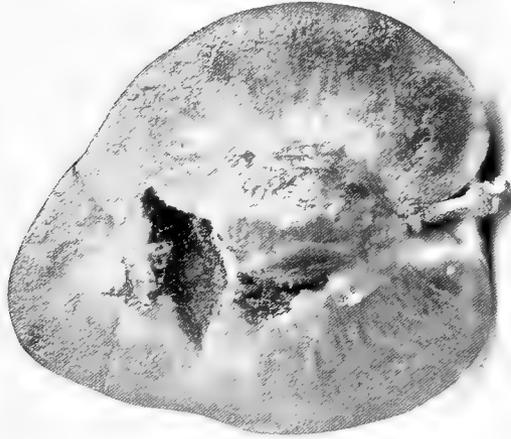
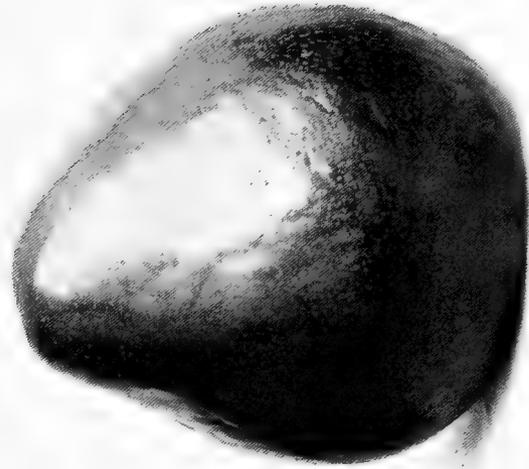
VANILLA

Vanilla of commerce is the fruit of *Vanilla planifolia*, a climbing orchid, the cultivation of which for commercial purposes is conducted principally in Mauritius and the Seychelles. It is a native of Central America. The treatment in Mauritius is as follows:—Vanilla is grown on poles in partial shade in loam, mixed with equal parts of sand and leaf-mould. Manure should not be used, but the soil should be renovated each season with a top-dressing of well-rotted vegetable mould and sand. The bed should be raised about 6 inches above the surrounding surface, and supported with stones. Cuttings of the stems, from 2 to 5 feet long, are planted and fastened to the poles up which they are to grow. The soil is kept moist. Thus started, they readily take root and grow into flowering size in two or three years. The flowers require to be fertilised artificially. This is accomplished in exactly the same way as orchid flowers generally are fertilised. The fruits grow to full size in about a month after fertilisation, but they are not mature until they are about six months old. They then begin to change to a yellow colour, when they are gathered, placed in a basket, plunged for half a minute in hot water, and exposed to the sun to dry. At night they are kept in a closed box. When they have become soft and brown, they are dressed with oil and dried again. When quite cured they are of a rich dark chocolate colour, and if in good condition they are covered with needle-like crystals.

Vanilla plants are grown and fruited at Kew, at Syon House, and in a few other gardens. At Syon House Mr. Wythes is very successful with it; bunches of as many as twenty pods, each 9 inches long, have been grown by him. He exposes his plants to full sunlight, except during the hottest part of the day. They are trained against the back wall of a lean-to house where the conditions are tropical, the minimum winter temperature being about 60 degs. There is a narrow border at the base of the wall, which is filled with peat, charcoal, and crocks. The plants attach themselves to the wall by means of aerial roots. The pods are placed in a box or drawer to dry, and they then retain their rich aroma for years.

MONSTERA DELICIOSA

An Aroid with edible fruits is exceptional, the order being remarkable for the acrid or poisonous nature of its juices. The *Monstera* is very similar to a big *Philodendron*, or it might be termed a glorified ivy, the behaviour of the plant generally being similar. Multiply all the parts of the Irish ivy by about fifty, and then you have *Monstera deliciosa*. There is, however, the striking peculiarity in the *Monstera* of perforated or windowed leaves, and the flowers and fruits are, of course, very different. The former, or rather the inflorescence, is not unlike that of an *Anthurium*, but the spadix is straight, thick, and club-like, while the spathe is only partially open and is boat-shaped. The spadix grows to a large size, 1 foot or more in length, and 2 or 3 inches thick.



THE KELSEY OR JAPANESE PLUM.



THE OTAHEITE ORANGE (*CITRUS SINENSIS*).

It takes about a year to mature, becomes yellow when ripe, and is then not unlike a huge corn-cob, but is soft and pulpy, deliciously aromatic, and most palatable, except that it causes a pricking sensation to some palates. On the whole, I think it better to look at and to smell than to eat. The plant requires plenty of room for its development, a pillar or back wall in a large tropical house suiting it, or the stem of a palm tree in such a structure as the palm-house at Kew. It would grow equally well on the ground, but it would occupy much space. I have seen it growing in summer by the side of a little pool in a sunny position out-of-doors in the garden of Mr. Chamberlain at Highbury, but the plant is essentially tropical.

EUGENIA UGNI

This is a compact little shrub, not unlike a myrtle or a box, which grows freely in a greenhouse, or even in the open air in the warmer parts of this country. In the garden of Colonel Tremayne at Carclew, near Falmouth, it forms a hedge, and its fruits are gathered annually to be used as dessert or for preserving. They are about the size of black currants, and not unlike them in flavour, but are less juicy and more aromatic. They are said to make a delicious drink. The plant is a native of Chili, but it is now widely distributed in sub-tropical countries. It is easily propagated from seeds or cuttings.

GUAVA

Psidium Guava is a West Indian myrtaceous shrub or small tree, with numerous branches and ovate smooth green leaves 3 inches long, bearing in their axils clusters of two or three whitish flowers $\frac{1}{2}$ -inch in diameter. The fruit is globose (variety *pomiferum*), or pear-shaped (variety *pyriferum*), and is green, not unlike a little apple, with an agreeable, somewhat acid flavour. It is largely grown in tropical countries for its fruits, which are eaten raw, or form the well-known guava jelly.

P. cattleianum (the Purple Guava) is a Brazilian species, with dark crimson fruits, and by some is preferred to the common guava. It was first noticed by Mr. William Cattley, after whom the genus *Cattleya* was named. He grew and fruited it in his conservatory at Barnet, two crops of fruit being produced by one tree in the same year. These plants are easily grown either as bushes, or trained flat against a trellis. They have a tendency to grow too dense if not thinned somewhat freely every year. A sunny position in an intermediate house is the best position for them. An early peach-house suits them admirably.

LOQUAT, OR JAPANESE MEDLAR

Eriobotrya japonica is an evergreen shrub or small tree, with thick branches bearing large lanceolate leathery leaves, sometimes 1 foot long, and terminal hawthorn-like flowers, which are deliciously fragrant. The fruits are plum-like, yellow, tinged with red, and they contain a larger core of stones than is

desirable. The pulpy portion is slightly acid, very sweet, and aromatic, suggestive of an apricot. In sub-tropical countries the fruit is a general favourite, and it sometimes finds its way to Covent Garden Market. Any one who has lived in the tropics knows the value of the loquat as a dessert fruit. It is a native of Japan and China, where it forms gnarled old specimen trees. It was cultivated and fruited at Kew nearly a hundred years ago. It is grown there still, both in the open air, where it is trained against a south wall, growing vigorously, but never flowering; and in the temperate house, where it both flowers and fruits. The loquat is easily raised from seeds, or by grafting on the quince, to which it is closely related. It grows rapidly, soon forming a shapely evergreen shrub, but it requires to be improved in the quantity of "meat" in its fruits ere it can win a place among fruit trees for the English garden. There is a good illustration of it in the *Transactions of the Horticultural Society*, iii. 299 (1820).

VANILLA, THE (see p. 214).

CHAPTER XIX

THE VINE

By OWEN THOMAS

WITH the introduction of more convenient and economical methods of building and heating glass-houses, with increased knowledge in the cultivation of the vine, grapes have been brought within the reach of millions to whom before they were nothing but a name. Vine culture under glass in this country has now reached such proportions that some of the largest growers annually export quantities of grapes to America after supplying the greatly increased and ever-increasing demands at home. This fact will give some idea of the extent of glass-houses devoted to the culture of grapes for market in Britain, and also indicate why the price of grapes has fallen so considerably the last fifteen or twenty years. This great change is due in some measure to the improved methods of preserving late grapes. Before the advent of the varieties Lady Downes, Black Alicante, and Gros Colmar, Black Hamburgh, Barbarossa, and West's St. Peters were the varieties depended on for a late supply, and after Christmas they were rarely had in good condition. The end of May as a rule was the earliest date at which ripe Black Hamburgh grapes could be had, so that for nearly five months no ripe grapes were forthcoming from British gardens. One cannot wonder that early grapes were so valuable; they were so much thought of some twenty or thirty years ago as often to fetch from 15s. to 20s. per lb.

There seems no doubt that the history of the vine can be traced to an earlier period than most exotic or hardy fruits now generally grown in Britain. It certainly has a most remarkable record, for even in early Scripture mention is frequently made of the vine, more particularly of its use for wine-making.

The grape vine (*Vitis vinifera*) is found growing wild in the temperate regions of Western Asia and Southern Europe, and is usually supposed to be a native of Southern Asia Minor. De Candolle, in *L'Origine des Plantes Cultivées*, says of the grape vine that it grows there with the luxuriant wildness of a tropical creeper, clinging to tall trees, and producing abundant fruit without pruning or cultivation. Its dissemination by birds and other agencies must have begun very early, perhaps before the existence of man in Europe or even in Asia. Records of the cultivation of the grape and of the making of wine in Egypt go back 5000 to 6000 years (Nicholson). The exact period of the introduction of the vine into this country is not known, but it is generally conceded to be about the year 10 A.D., at which time the Romans had possession of some portion of our island. The Romans, therefore, are usually credited

with having been the means of introducing the grape vine into Britain. Pliny records a vine that was six hundred years old, and Miller says that the vineyards in some parts of Italy hold good for above three hundred years.

REMARKABLE VINES.—There are several wonderful examples of the size and vigour to which the vine will attain in our own country; perhaps best known is the one at Hampton Court Palace, an old historic vine that no one interested in vines should miss seeing when in London. It was planted during the reign of King George III., in the year 1768, and is therefore now (1903) one hundred and thirty-five years of age. It is said never to have failed to produce a crop, and that with little help in the way of cultivation or manure, as far as the roots are concerned, for no one knows where they have penetrated. The girth of the stem is $3\frac{1}{2}$ feet, and its branches cover an area of 2200 square feet. At the height of $3\frac{1}{2}$ feet from the ground the stem is divided into three huge limbs, the largest of which is 90 feet long, and the others 80 and 82 feet respectively. In its early days the vine is said to have matured two thousand bunches of grapes annually, each bunch weighing about 1 lb. Now it is only allowed to carry some twelve hundred bunches; these weigh about 600 lbs. As is to be expected from the great age of the vine and the difficulty of feeding the roots, the bunches are small, and so also are the berries, but their delicious flavour makes generous amends. In this respect it is unapproached by any variety of Black Hamburgh I know. This vine is open free to the inspection of the public every day in the year, subject to certain regulations, and as many as nine thousand visitors have passed through the vinery in a day.

Another wonderful vine, and, like the above, a royal vine, is the one at Cumberland Lodge, Windsor Great Park. It is more remarkable in many respects than the one at Hampton Court. It is not quite so old, but it certainly is one hundred and twenty years of age. This is attested by the attendant lately in charge of the vine, from evidence handed down to him by his father and his grandfather, who lived in the district. It is more notable than the Hampton Court vine in respect of its size and the weight of crop; the branches cover a roof space of 3450 square feet, and annually bear from 2000 to 2400 bunches. This vinery is in the gardens of Cumberland Lodge, the residence of H.R.H. Prince Christian, and within view of the upper portion of Virginia Water. It is open to the public all the year round, and is in charge of his Majesty's head gardener at Windsor. At Silwood Park, a country residence near Ascot, is another vine of great age and proportions. Scotland boasts of one (if not more) vine of great age, size, and fertility. It is said to rival the Cumberland Lodge vine in size, and is in the gardens at Kinnell House, the residence of the Marquis of Breadalbane. Another celebrated vine deserving of mention is the Manresa vine, near Roehampton. This is comparatively modern. It has filled several houses, and were others available it is reasonable to suppose that the vine would be much larger now. It produces heavy crops of splendid quality grapes every year. The variety is Black Hamburgh.

VINERIES.—The glass-house now most generally adopted for the culture of the vine is that known as the span roof. In many gardens the lean-to and the three-quarter span are in use, and are also still erected. These latter houses



THE OLD VINE AT HAMPTON COURT.



STEM OF THE HAMPTON COURT VINE.

are most useful where grapes are required very early in the year, for usually being built against a south wall they benefit more from sun heat, and are naturally warmer than the span roof, which is exposed on all sides. The lean-to house is also more easily fixed, and is cheaper than a span roof, provided that the wall already exists. Those who are fortunate enough to possess a wall against which a house may be built would, of course, be unwise not to take advantage of it, for equally good grapes can be grown in a lean-to as in a span roof. The reason I would recommend the latter where no special conditions exist is because (1) a span roof is cheaper if a wall has to be built before the lean-to house can be erected, and (2) it will hold twice as many vines as will a lean-to, and all possible space is utilised. In the lean-to such is not the case, for the back wall is practically useless. Vines may be planted, and they will cover the wall with foliage, and for the first few years, until the roof is covered by the permanent vines, will give a small return in fruit, but not afterwards, in consequence of the absence of light. The three-quarter span, or what is more commonly understood as the hip roof, is self-descriptive. It answers for early forcing as well as the lean-to, indeed better in some respects, and especially in that more light is admitted, particularly in the afternoon and evening. It also gives a larger roof surface. The disadvantage of this style of house is that it is more costly in construction. Span-roofed houses are best for the successful production of mid-season and late grapes. The ends of these should face north and south. Any one contemplating covering an acre or two of ground with span-roof houses for the purpose of growing grapes for market, I would advise first to visit one or more of our best commercial grape-growing establishments. These are to be found in many parts within a short distance of London, notably Finchley, Broxbourne, and Worthing. Abundant facilities must be provided in order that the vines, when at rest, may have as much air as possible; and care must also be observed that the ventilators are made air-tight.

HEATING.—Provide as many 4-inch pipes as will give sufficient heat to meet all requirements in the coldest weather without the pipes being at any time very hot. Nothing operates more against successful fruit culture in glass-houses than overheated pipes. Naturally the number of rows of pipes laid down will depend upon the size of the house, and whether it is intended for early forcing or only for midsummer or late crops. If for the former, the houses should be comparatively small, and lean-to or three-quarter span. Six rows of 4-inch pipes should suffice—four flow pipes and two return—the four placed within, say, a foot of the front wall of the house (but quite 10 inches from the vine stems), and the two returns in the middle of the house. Later houses will require less pipes in proportion, but it is false economy to lay down insufficient. Valves must be fixed in the flow and return pipes where these enter the house.

TRELLISING FOR THE ROOF.—It is a common mistake to fix the trellis too near the glass, thereby cramping the foliage, subjecting the leaves to injury from disfigurement by sun, and also from extreme cold at night by contact with the glass. From 18 to 24 inches should be allowed, according to the vigour of the varieties grown. Wires one-fifth of an inch thick should be placed parallel to the front of the house, at 12 inches apart.

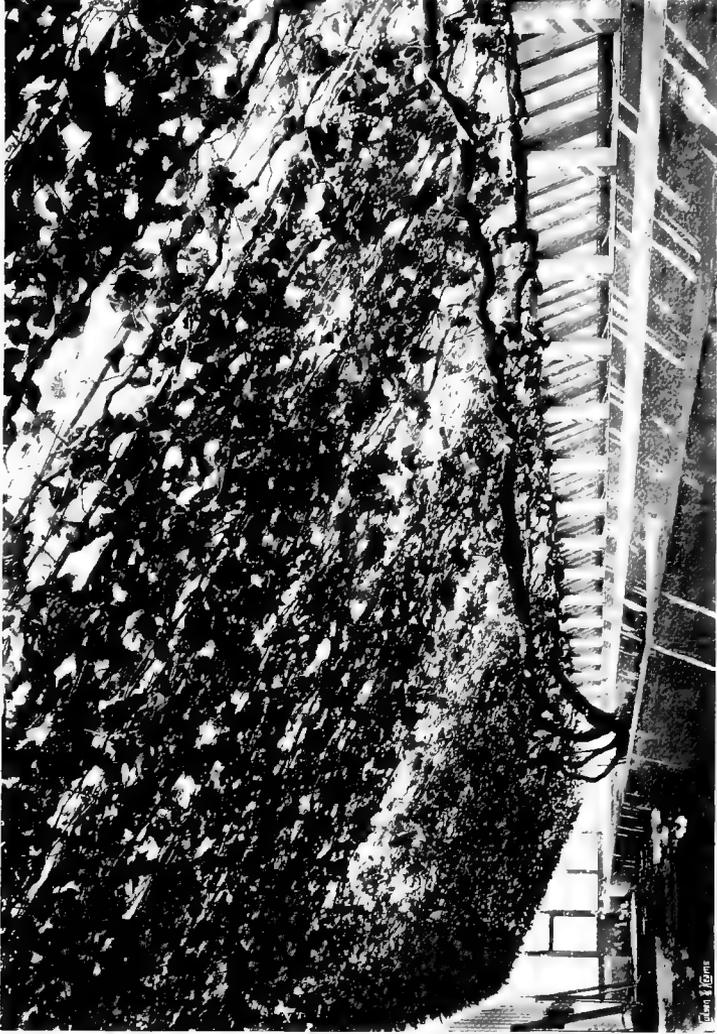
THE BORDER.—To avoid reiteration, I would refer readers to the chapter on the peach under glass for information as to the formation of the border. Presuming the old soil to have been cleared away and the bottom of the border covered by concrete (if the nature of the subsoil demands this), the pipes laid down and covered with rubble, all is ready to receive the soil. I ought here to remark that the front wall of all fruit-houses should, if possible, be built on arches, or iron girders placed on pillars, so that the inside and outside border are connected. Commence with borders of limited size, instead, as was a common practice years ago, of filling the whole border space when the vines are planted. The first step to take in forming the new border is to cover the drainage for a distance of 3 feet from the front wall inside the house, in the archways under the wall, and for 18 inches outside the wall, with good firm turves, placed grass side downwards. On the outside edge of these, a wall of turves should be built as high as the border will be when completed, *i.e.* at least $2\frac{1}{2}$ feet above the drainage and from 6 to 9 inches higher than the top of the arches in the wall. When these turf walls are completed, a space of about 3 feet will be left to fill up with soil in which the vines are to be planted.

THE SOIL.—This should consist of turf cut from old pasture land, preferably from that resting on chalk, lime, or sandstone; the turf should be cut 5 inches deep with the grass left on intact. I am aware that turf of this quality is beyond the reach of many. I hasten to assure them that the vine is most accommodating as regards the soil in which it will grow, but if the highest success is to be attained the best possible loam must be provided. Turf cut from the margins of public roads or roadside banks, if collected and stacked together for three or four months, makes a good and cheap soil. Where the land upon which the vinery is built consists of deep loam and is well drained, if trenched and well manured, it will produce excellent grapes. Turves should be cut up into large pieces 7 or 8 inches square, and as little of the loose soil used as possible.

To each cartload of turf should be added one cwt. of $\frac{1}{4}$ -inch bones, two barrow-loads of old broken bricks, mortar, and plaster rubble, one bushel of quicklime, and a barrow-load of road scrapings. Mix all well together. I ought here to impress upon the inexperienced the importance of having the soil moist, but not so moist that it sticks to the hands. After the material has been properly mixed and formed into a heap, means should be provided to protect it from rain until required. All we have to do now as far as the soil is concerned is to fill up the space between the turf walls, and so prepare the border for planting the vines. The next important question to consider is—

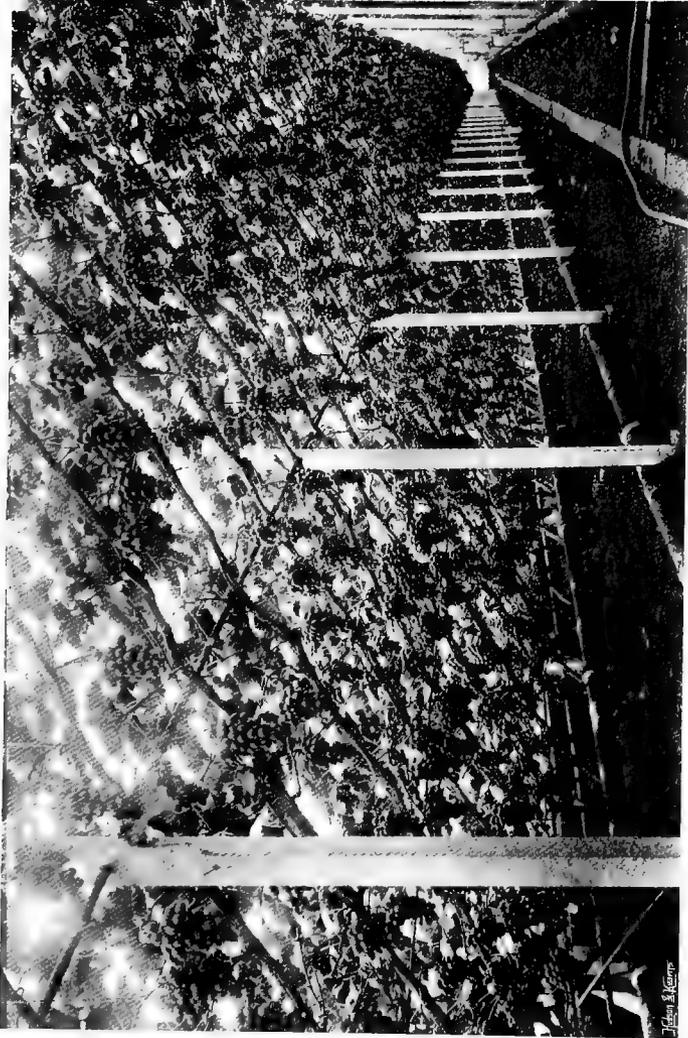
PLANTING.—I say important advisedly, because on the careful manner in which this work is done depends much of the success or otherwise of the vine. There are two methods: the one is practised in autumn and the other in summer. I have succeeded equally well with both, but I think that for amateurs the former answers best.

AUTUMN PLANTING.—By this is meant planting when the vine is dormant; with summer planting the work is carried out when the vine is in leaf and full growth. A good time for winter planting is from the middle of October



THE GREAT VINE AT CUMBERLAND LODGE, WINDSOR GREAT PARK.

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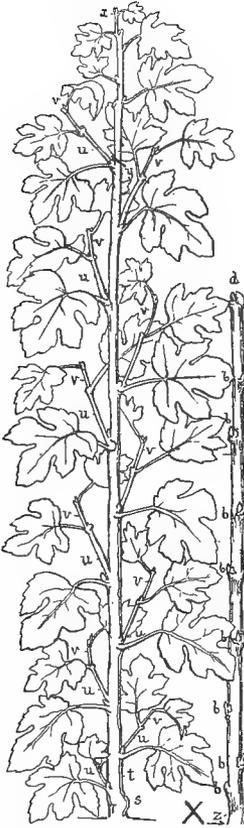


ONE SIDE OF A SPAN-ROOFED MARKET VINERY FILLED WITH ALICANTE GRAPE.

to Christmas, the month of October being best. For this purpose vines grown from "eyes" inserted the previous spring are preferable, and may be purchased for a few shillings each. They should be removed from their pots, the soil shaken from the roots, and the latter dipped and washed clean in water. The roots will probably be tangled, and must be unravelled. Before commencing planting, holes $2\frac{1}{2}$ feet square and 9 inches deep should be made in the border, and soil less coarse than that recommended for the bulk of the border will be necessary to place in contact with the roots. The soil should be made firm as planting proceeds, vines planted in loose borders are never a success. Long and strong roots must be shortened to about 18 inches or 2 feet; place the soil about each root with the hand until all are covered to the depth of about 6 inches. Place a narrow ridge of turf on the surface, some 3 feet from the vine, in order to make sure the roots will receive the benefit of water given, and also that the soil in which there are no roots is not uselessly saturated. Towards the end of November the vines must be pruned, and the way to do this is to cut the vine down, leaving only two of the lower buds, one of which will form the new cane for the next year's growth; one bud is really enough, but it is safer to leave two in case of an accident to one. To a small stake long enough to reach from the border to the base of the trellis the vine should be attached. Protect the plants from damage by insects by placing soot around each stem about 4 inches from it.

SUMMER PLANTING.—The best time to do this is the first week in July, and the vines most suitable are those called "cut backs," that is to say, vines grown from "eyes" the previous year, cut back to one or two buds the following spring, and grown on again in pots. By July the canes will be 4 or 5 feet long. Give the plants a good watering the day before removing them from the pots. The same care must be observed in laying out the roots as advised when winter planting, the young vines are in full growth, so the roots must not be unduly disturbed or the vines will certainly suffer. As soon as planting is completed the vines should be well watered with warm water. Take great care not to allow them to become dry, plants grown in pots are very liable to do so when planted out. The vinery should be kept warm and moist. Shade heavily until the roots have taken hold of the new soil, which will soon be apparent.

TREATMENT AFTER PLANTING.—The young vines should be encouraged to make rapid and vigorous growth during the next two months by keeping the atmosphere moist, by syringing copiously before closing the house. A moderate amount of air must be given on warm bright mornings, a little being admitted as early as 6 A.M. in the summer. The less fire heat then used the better the vines will succeed. During the whole season of active growth the atmosphere of the vinery should be kept moderately moist in order to encourage strong and healthy growth, and the way to secure this condition is by syringing the borders, walls, and paths of the house several times during the course of the day, and also at least once in the evening. When the young vines are 10 or 12 feet long they should be stopped, that is, the ends of the canes pinched off; side-shoots ("laterals") will then form, and should be



VINE TWO YEARS OLD, FOR FRUITING IN POT OR PLANTING

(s) Point where cut back when at rest, the vine having been grown from an "eye" inserted the previous spring; (t) cane; (u) laterals pinched at first leaf; (v) sub-laterals stopped to one point as produced; the leader is stopped near top (6 to 8 feet from base, according to vigour and length desired); (x) lateral from extremity pinched to three leaves and afterwards to one leaf as produced; (y) point of shortening for fruiting in pot, always to a plump round bud below point of stopping, and, of course, to length required. x. Same vine (leafless) shortened to three buds above lowest wire of trellis when vine is to be planted out, and laterals cut off close to stem; (z) point of cutting back in previous winter; (b) points where laterals have been cut off; cross line indicates lowest wire of trellis; (d) point of shortening cane.

encouraged until five or six leaves have developed, and then be stopped. By the end of August the summer's growth will be complete, and more air must be admitted in order to ripen the wood and buds. When October arrives the ventilators should be left fully open in favourable weather night and day, and by November the vines will have matured their season's growth, and should be at complete rest.

DISTANCE APART TO PLANT.—Discrimination is necessary in this matter, as some varieties require more space than others, and again, those intended for early forcing may be planted closer together than those for mid-season and winter supplies. Early vineries are usually planted with Black Hamburg, Foster's Seedling, and Buckland Sweetwater; 3 feet apart is space enough to allow for these, and speaking generally, 4 feet will be the proper distance for the mid-season and late varieties.

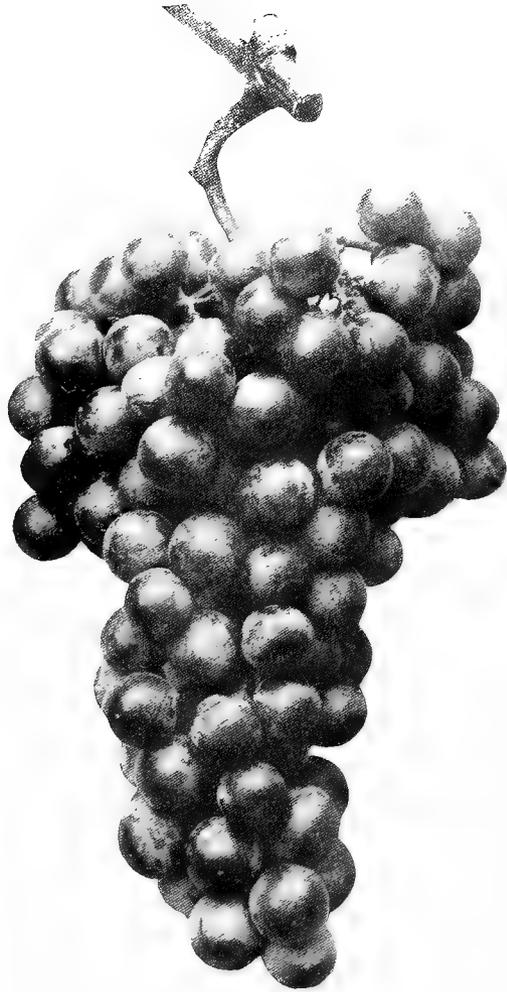
SECOND YEAR AFTER PLANTING

When considering the cultivation of the vine it is well to fix a time of year when growth may be said to end and when it begins. I think it is an advantage to fix the end of the season at October 31st and the commencement of the new season on November 1st. The first week in November the gardener naturally casts his mind forward to another year of important work. To have early crops in May the vinery must then be closed and forcing commenced. If the vine borders are worn out, and the condition of the vines indifferent in consequence, the work of renovation should also then be taken in hand. It is the time of year too for pruning all summer and early autumn fruiting vines, for making new vine borders and planting dormant vines, and cleansing the vines and vineries from insect pests.

PRUNING.—Supposing the young vines to have made satisfactory progress during the first year of their growth, by November the canes will be 10 or 12 feet long, and ought to enjoy a long period of rest. It is acknowledged by



A REMARKABLE FOSTER'S SEEDLING VINE AT FROGMORE.



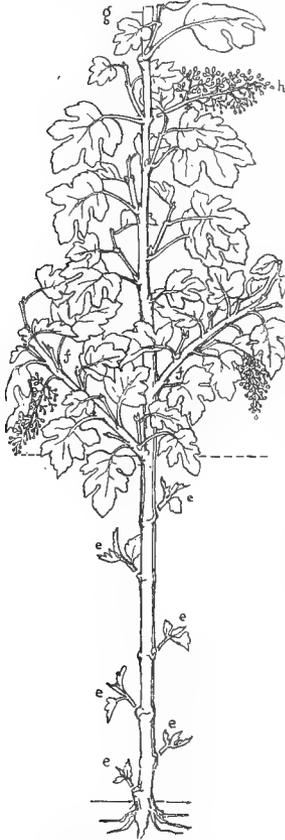
*GRAPE REINE OLGA (AN EXCELLENT VARIETY FOR
WALLS OUTDOORS).*

all good cultivators that the sooner the vine is pruned after its leaves have fallen the better. Should any of the vines have made only weakly growths, then these must be cut back to within three buds of their bases, that is to say, only three buds will be left of the previous year's growth. The moderately strong canes should be shortened to 2 feet, and the strong canes may be left 4 feet long. Some advocate that a length of from 6 to 8 feet of cane should be left at pruning time. The roof of the vinery is covered with fruit-bearing wood in much less time I admit, but the vines are planted with the object of first making strong canes and having regularly distributed, well-developed fruit-spurs. This is difficult and often impossible with the long cane pruning; the buds at the base often refuse to grow at all, and others higher up only grow weakly, producing, as a consequence, badly developed and irregularly placed spurs, which in turn only produce small bunches. Moreover, the main stem of the vine never attains proper strength in after years by pursuing this system of pruning, and as vines, excepting early forced ones, with careful management will produce heavy crops for from thirty to forty years, the importance of making a good start will be apparent. Some of the wood cut off when pruning should be saved, tied up in bundles, and placed in the shade; it may be wanted for propagating in spring. Having completed the pruning of the vine, the next thing we have to do is to wash down the house—glass, woodwork, and walls—thoroughly, using soft soap and water and a hand scrubbing brush. Before beginning this work the vine border should be covered over with mats or loose straw to prevent its being made wet and sticky. After cleaning is over remove the surface soil about an inch deep and replace with fresh. A new stake should be applied to each vine, and the same fastened to the roof trellis. After this the vinery ventilators must be thrown open to their full extent, and the vines given the advantage of all air possible night and day while at rest, which will be from now until the end of March. In case of hard frost the ventilators must be closed at night. The outside border should be covered over early in November with dry leaves, straw, mats, or boards to keep off rain, not to protect the roots from frost, as this will not harm them. If the stems of the vine are outside they had better be covered over as a protection from frost. When the ventilators are open during winter as recommended, the precaution should be taken to empty the hot-water pipes, or in the event of hard frost the water in the pipes will freeze, and when thawing takes place the pipes may crack.

ABOUT BORDERS.—For midsummer, autumn, and winter grapes it is not absolutely necessary to have an inside border at all. First-class grapes can be grown in an outside border, but for early forcing it is better to have both inside and outside. There is no doubt an advantage in having the two sorts of borders, for when they need renewing, the work can be carried out with comparatively little disturbance to the roots, the inside border being done one year and the outside border a year or two after.

COMMENCEMENT OF GROWTH.—We suppose the young vines to be pruned, the border top-dressed, and the vinery cleaned. In March the long rest comes to an end. About the 20th March is the best time to start the vines

for their second summer's growth. Close the house early in the afternoon, having well syringed the



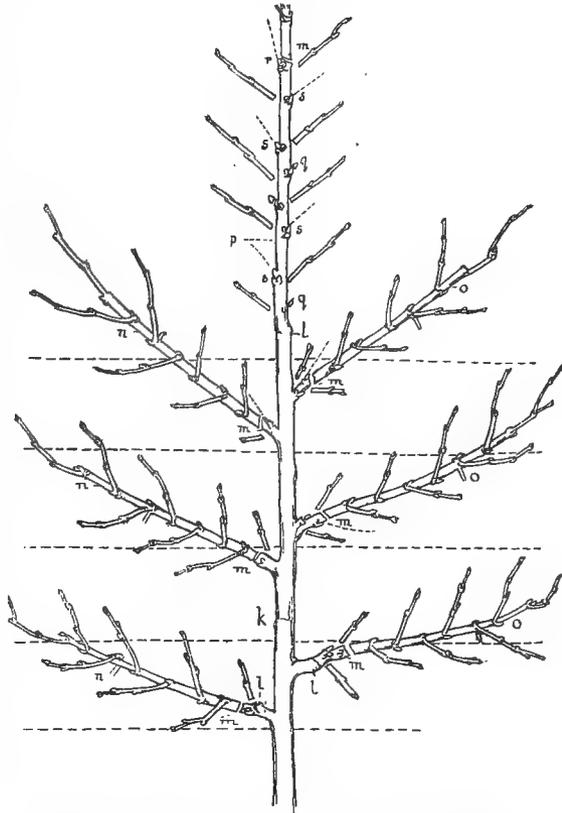
YOUNG VINE IN FIRST YEAR'S GROWTH AFTER PLANTING

(e) Shoots rubbed off to lowest wire of trellis; (f) side or bearing shoots, termed laterals, stopped two joints beyond bunches of fruit, other laterals pinched to one leaf; sub-laterals are also pinched to one leaf as made, though beyond a bunch these may extend two or three leaves before pinching, as space permits; (g) leader stopped; (h) bunch of fruit on leader cut off.

sub-laterals to issue from the axils of the leaves below; these must also be stopped at the third leaf, and every subsequent shoot at the second leaf.

vines and the interior of the vinery, letting the temperature reach 65 or 70 degs. Fahr. Artificial heat must not be used for at least ten days or a fortnight. The temperature at night should be low, say 55 degs. Much of the future success of the vine depends upon the buds bursting strongly and regularly, therefore young vines must not be started too early or in a high temperature. In about a fortnight the buds will swell and be ready to break into growth, but all must not be permitted to grow. We must determine which are to form the permanent fruit-bearing spurs of the vine. These should be about 15 inches apart on either side, and the intervening ones must be gradually taken off; it is, however, advisable to leave the bud next to the permanent one longer in case of premature loss by accident of the latter. The growths are very tender, and the least careless touch may break them off. Growth will soon be active, and the grower must provide artificial heat, to be used chiefly at night and to prevent the temperature falling below 57 degs. When the young shoots are 10 or 12 inches long a piece of matting should be attached to them and fastened to the trellis simply to prevent their touching the glass; ultimately they must be brought down to the trellis. No item in vine culture requires more careful performance than this. As they grow older the shoots become stronger, and by the exercise of patience may be brought safely to the trellis in time. An interesting point now suggests itself, namely, how early should the vine be allowed to produce fruit? The young cane of moderate size which has been pruned back to 2 feet may produce one or two bunches of grapes, and the stronger cane, which was left 4 feet long, may be permitted to carry two or three bunches; each of these should weigh from 1½ to 2 lbs. Allowing young vines to fruit diverts some energy to the production of fruit instead of luxuriance of wood growth. The young shoots will usually produce a bunch of grapes opposite the second or third leaf, and after three more leaves have developed they must be stopped. This will cause

SUMMER TREATMENT.—Carefully stop sub-laterals and secure the main shoot to the trellis as it grows, and when 9 or 10 feet long it should be stopped, as advised in notes on the first year's treatment. This will soon cause other shoots to form, which must be treated as advised for spur-laterals. Watering, ventilation, and moisture in the atmosphere must have due attention at all times, as directed before; at the end of the second year the young vine will have filled the roof with healthy and luxurious foliage and sturdy, strong canes. With reference to tying down the young shoots of the vine, a word of caution is necessary to impress upon the beginner to be careful never to tie them to the trellis tightly, for when first secured they are only partially developed, and the further swelling of the shoot will cause the matting, or whatever is used for tying, to sink into it, often destroying the bark; this should be remembered when tying is done.



VINE ON ROOF TRELLIS AT THIRD WINTER PRUNING

THE THIRD YEAR.

We have now come to the end of the second year's growth, and the routine of work for the third year will necessarily be followed more or less on the lines previously recommended. Pruning must be completed as soon as the vines have lost their leaves. The side shoots (spurs) should be cut back to two buds; one would be enough, but it is preferable

- (k) Point of pruning stem previous winter; (l) points of second pruning; (m) points of third pruning, or current year's winter pruning; (n) (o) bearing shoots (that in preceding summer each bore a bunch of grapes, were stopped two joints beyond fruit, and laterals pinched to each leaf as made) cut back to one bud, the object being to keep spurs close to rod; (p) leading growth or cane on which laterals have been pinched to one joint as made, and shown properly cut off; (q) buds cut out; (r) point of shortening cane, the dotted line indicates continuation growth the following year; (s) buds from which bearing shoots issue, and ultimately form spurs, when pruned, at opposite sides of the vine, about 18 inches distance apart on each side.

to leave two until you can see which is likely to give the better bunch; the weaker bud must then be rubbed off. The main shoot or cane should be shortened on the same principle as advised before, namely, that the weak one must be cut fairly hard back, leaving only a foot of the previous year's growth; the moderate cane may be left 2 or 2½ feet and the strong cane 4 feet long; always cut back to a bud. The young vine should then be washed with Gishurst's compound. A small box will go a long way; it is as useful for this purpose as anything I know. Instructions to prepare it accompany each box. Even if the young vines have been free from insect pests during the season of growth, it is a wise precaution to have them washed with insecticide. When this work is done and the house cleansed, the border will need to be enlarged both inside and out.



GROWTHS FROM A SPUR THAT IN WINTER HAS BEEN PRUNED TO TWO BUDS

(u) Shoot from uppermost bud bearing a cluster of grapes; (v) shoot from lowest bud also showing a bunch of fruit, but small and not desirable to leave; (t) point of cutting away bearing shoot at winter pruning in order to keep spur near to stem; (w) base of spur; (x) point of shortening shoot not allowed to bear, to two buds at winter pruning.

ENLARGING THE BORDER.—The best way to do this is to pull down the turf walls which were built when the borders were formed, and build others of fresh turf, giving additional space of 2 feet both to the inside and outside border. If it is difficult to procure fresh turf, the old turf walls will be very useful when enriched by fresh loam and the other material recommended originally. I would, however, prefer that new loam be used (with the other ingredients) in enlarging the border, as better results unquestionably follow. Before placing this new material about the roots of the vines, the old soil should be forked away until a fair number of roots are reached; the points of these should be placed in the new soil as carefully as when the vine was first planted, taking care to shorten any long, coarse, fibreless roots. All the small roots must be scrupulously taken care of, and replanted in the new soil. If any are bruised they should be cut

back beyond the injury. Then add sufficient soil to the border to make it level with the old, top-dress the old border with new soil, and place the ridge of soil or clay round the stem of the vine as far as the original border extends, to compel water to penetrate the border round about the stem, where are the most important roots and where often they suffer most from want of water. The vines will enjoy a long rest, and when again they are started into growth, towards the 20th of March, the same routine of work will have to be gone through as that already described. At the end of the third year the roof of the vinery should be nearly covered with bearing wood, returning the grower handsome crops of valuable grapes. With the fresh soil added, the outside border will be 3½ feet and the inside one 5 feet wide. This will suffice, with annual

top-dressings, until the end of the fifth year, when 2 feet more should be added both inside and out. The next and last enlargement of the border two years after should make it complete, say 9 feet wide outside and 8 feet inside. This extent of border I consider quite large enough to meet all requirements.

Before I leave the subject of enlarging borders, I should like to say, that if the vine roots had made good progress the quantity of new soil recommended would not be too much; on the other hand, if their progress had been poor, then less new soil would suffice. It will be observed that in the composition of the border I have refrained from recommending the use of artificial or organic manures. These are not necessary. There is nothing better than loam (with the additional material at first mentioned); when, however, the border is full of roots and the vines are in active growth and carrying heavy crops, the help of manure is of vital importance.

WATERING.—In considering this subject, it must not be forgotten that we are dealing with artificially constructed borders, so well drained that water passes through them very freely. The vine border should never be allowed to become dry. The borders of early vineries started on the 1st of November must have a thorough soaking of warm clear water a week or so before the house is closed and before the borders have been top-dressed. They need not be watered again until the buds are about to burst into growth, when weak manure water from the stableyard, and warmed, should be given. The next watering must be given before the vines come into flower, and this time weak guano water—by this I mean a handful of guano to three gallons of warm water. If the roots extend to the outside border, this also is watered before the house is closed and before being covered for the winter. There is nothing gained by watering the outside border again until the berries are swelling, say towards the end of February or the beginning of March, when the covering should be taken off and a good soaking of diluted manure water from the stableyard given. Afterwards the covering must be replaced until all danger of frost is over. Early in May the border being exposed to the influence of the sun and air will quickly dry, and should receive water as frequently as the inside one. This must again receive manure water as soon as the berries have formed. From this time (say May) until the crop is ripe, it is safe to say that water should be given every ten days or a fortnight, and the manure varied with each watering, always bearing in mind not to apply artificial manure in strong doses. If farmyard liquid manure is to be had, I would always use this twice as often as an artificial fertiliser. I have never seen harm follow the use of even an overdose of this, as



SPUR PROPERLY PRUNED

(y) Shoot that has borne fruit cut away altogether; (z) shoot that has not produced fruit cut back to two buds.

I often have in the case of the latter. When the grapes are ripe, the vines must not receive such copious waterings as before, nevertheless the border must never be allowed to become at all dry. Give clear water only until the grapes are cut; immediately afterwards the borders should be well watered with liquid manure to nourish the vine after the exhaustion of developing and ripening a heavy crop of fruit. Thence, until the vines are at rest, water will be required in moderate quantities only, and at less frequent intervals. The remarks here made for guidance in watering the border of the early forced vinery apply equally to vines grown under glass when started at any season of the year. One word as regards watering the borders in winter while the vines are practically dormant. At least one thorough irrigation of the borders at this season is highly beneficial, and strongly to be recommended. Farmyard manure water should be used, and in stronger solution than for summer application.



GROWTH FROM YOUNG
VINE CUT DOWN TO
TWO BUDS

- (z) Growth rubbed off;
(j) growth retained
to form a vigorous
cane.

MOISTURE IN THE ATMOSPHERE.—During the vine's growth, from the time the vinery is closed until the berries are black and nearly ripe, moisture must be provided. The vine, with its immense leaf surface, is almost as much sustained by what is absorbed through the leaves as by the sustenance derived by its roots. A moist atmosphere also helps to keep the vines free from insect pests. A dry arid atmosphere encourages thrip, and red spider particularly. The ways of providing moisture are several. One is by using the syringe, and this is perhaps the best. Others are by having troughs fixed upon the hot-water pipes, or by attaching an indiarubber pipe to the tap where a force of water already exists. This latter is an easy and an economical method, but during winter and spring the water is naturally so cold as to lower the temperature of the house when applied. At that season it is best to use the troughs on the pipes, and syringe with warm water. A watering-can with a fine rose may, of course, be used, but the objection I have to this is that too much water is used at a time, injuriously affecting the border by constant wetting of the soil.

SYRINGING THE VINES.—From the time the vinery is closed until the buds have burst into growth, the vines should be moistened with the syringe several times a day. Afterwards the foliage should not be syringed; it must depend upon the moisture from the atmosphere to keep it in health. When the vines are attacked with red spider or thrip, they must be then well syringed; and if rain water is used no great harm to the fruit will result, but if water containing lime is used, the berries will be so spotted and disfigured as to be useless for dessert.

TEMPERATURES AND VENTILATION.—A table of approximate temperatures

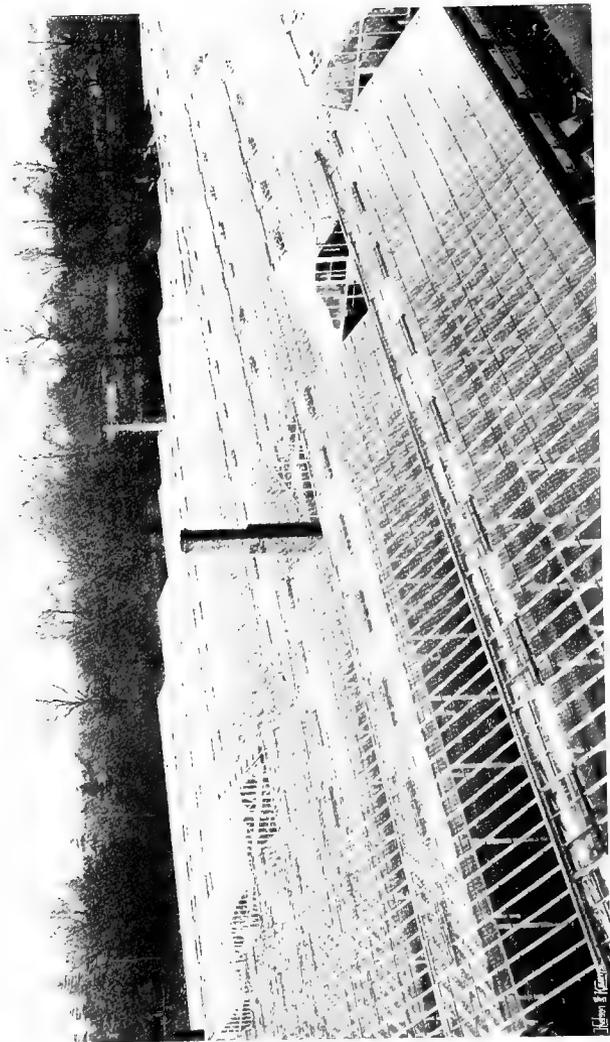


YOUNG CANE CUT
DOWN TO TWO
BUDS

Sometimes prac-
tised when vine
is weak.



HOW THE VINE IS TRAINED IN A MARKET NURSERY.



VINERIES IN A MARKET NURSERY NEAR LONDON.

for guidance to the amateur and inexperienced is given at the end of this chapter; therefore, much need not now be said. The greatest care is needed in spring and early summer, when growth is young and tender, and the weather capricious. The chief point is to avoid draughts, and therefore the front ventilators must be sparingly opened (if at all) during cold weather, and especially if east winds prevail. Generally speaking, the heat in the pipes can be soon reduced by means of the valves, if sunshine suddenly occurs. Air in sufficient quantity can be admitted through the top ventilators to keep the temperature within proper limits. Afterwards, as the weather becomes warmer, more air may be safely given at both front and top, but always gradually; admit a little early in the morning, and increase the amount at intervals until the maximum is reached from noon to 1 P.M. The same method, in reverse order, should be carried out in the afternoon as the power of the sun declines, until it is safe to close the vinery without causing the thermometer to register more than 80 or 85 degs.

SUCCESSIONAL CROPS.—It will help the grower as to the proper time to start his vines for successional crops if he will bear in mind that, from the day they are started until the fruit is ripe, six months usually elapse. For instance, an early vinery, started on the 1st of November, should produce ripe grapes at the end of April. Started on the 1st December, they should be ripe at the end of May, and so on through the season. Of course, by harder forcing it is possible to shorten the season in which grapes can be produced, but this would be at the expense of the health of the vine. It is always better to allow for a period of six months.

The number of bunches a vine with a single stem ought to be allowed to ripen depends upon the weight of the bunches, the variety of grape, whether quantity or quality is the desideratum, &c. If the bunches average 2 or 2½ lbs. each, eight or ten would be quite enough for most varieties. If the bunches are smaller, more in proportion might be allowed. If it is a question of weight, and not of the highest quality, then from twelve to fifteen bunches may be left of 1½ lb. or so each without detriment to the vine.

EXTENSION SYSTEM.—By this method, instead of restricting the vine's growth to one stem, several are allowed to grow. This, no doubt, is the most natural plan to adopt, but it is not always conveniently carried out under artificial conditions, especially where space is limited, and several varieties are wanted. I am of opinion that the vine will succeed better, live longer in good health, and produce better crops when grown on the extension system than when confined to a single stem for a number of years. The common practice among the best growers who allow their vines to extend, is to have two rods to one stem. Of course, if it is desired still further to extend the branches, one vine may in time fill the largest vinery, as at Hampton Court, Cumberland Lodge, &c. Should a cultivator wish to convert his single-stemmed vines into double ones, the process is very simple: he has only to select a shoot at the base, and encourage it to grow and take the place of the vine close by. This will take three or four years to accomplish, and the method of pruning, &c., will be the same as advised for newly planted vines

As the young cane makes progress, the vine it supplants must gradually be cut away to make room. By following this plan no loss of fruit will be sustained during the process of converting the single vine into a double one. Or the system can be carried out in a simpler way at the time of planting, by having them twice as far apart as recommended for single-stemmed vines, and the following year when growth commences train two shoots from each instead of one. I think the first plan is to be preferred, as the roof is filled more quickly with fruit-bearing wood, and the vine grown as a single rod will bear heavily for years, and can afterwards be doubled, as stated above, if desired.

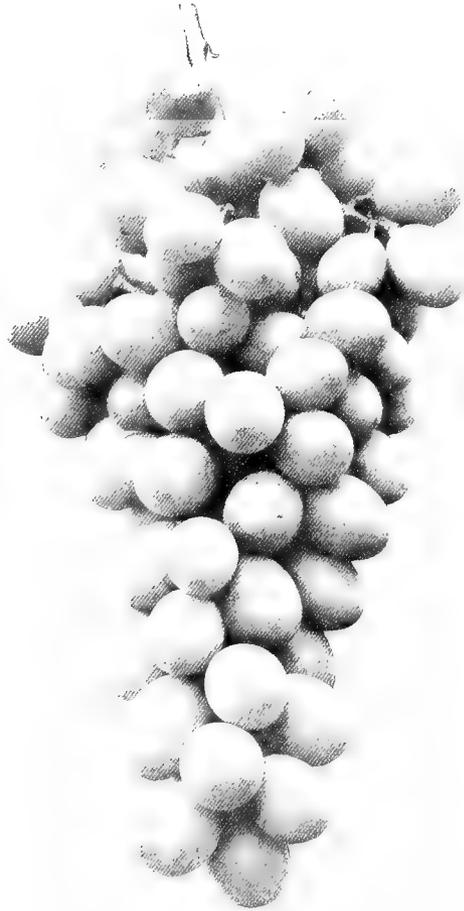
HOW TO RENOVATE OLD VINES.—There are thousands of vines throughout the country whose owners are at a loss to know how to reinvigorate and bring them back to health. The vine is long-suffering and patient, and will endure much ill-treatment before succumbing.

It may be well first to draw attention to a few of the causes which most frequently conspire to bring about, not the death (it is very seldom one sees a dead vine), but the unsatisfactory condition of many amateurs' vines. Often the border is at fault; it is badly drained, the soil is exhausted, or the roots may have entered unwholesome soil beyond the border. A mistake commonly made in the management of the branches is that of leaving too many spurs on the vine at the time of pruning, with consequent overcrowding of foliage in summer. There must never be less than a foot between each spur; on strong and healthy vines 15 inches should be allowed. The summer shoot issuing from the spur should be stopped at the sixth leaf, and the laterals which issue from the axils of the leaves afterwards should be stopped at the third leaf. As a rule, sub-laterals are allowed by the amateur to run wild, and perhaps are removed once or twice indiscriminately during the season. The vine has no chance of perfecting its main leaves or properly developing its fruit buds under these conditions. Another frequent source of trouble is crowding the vinery with a medley collection of plants, many of them probably infested with noxious pests. I see no harm in preserving a few bedding plants through the winter, and propagating them in the spring in the vinery if there is no other place available, as they are usually free from insects. It is when an attempt is made to grow a mixed collection of plants in the vinery more or less all the year round, and when a compromise is made between the conditions favourable to the vine and the plants, that bad results follow. Now as to the remedies. You may ask one gardener his opinion as to the best remedy to adopt to bring your ill-conditioned vines into health and fertility, and his reply may be, "Pull them up, burn them, and plant young ones." This is all very well. You do not always want to be replanting vines; it takes at least four years to fill the vinery with grapes. Better advice would be to give some information as to the cause of the failure, and point out remedies which would rejuvenate and permanently re-establish the health of the vines.

The first thing to do is to examine the roots. Should there be an inside and outside border, then examine the one inside first, and that outside the following year. To do this effectually dig a trench 2 feet wide, deep enough



GRAPE APPLEY TOWERS.



GRAPE MUSCAT OF ALEXANDRIA.

to reach the drainage, and as far away from the stems of the vines as is necessary for safety's sake, say 7 or 8 feet. The material taken out of this trench should be carted away, as it must on no account again be used for the vine border. Then with a fork gradually draw away the soil, working towards the vine stem, and taking care of every root met with. This should proceed until one is within 18 inches or 2 feet of the stem of the vine, where a good many roots will be found. All the loose soil that we have removed should be taken away, then make the drainage effective. While this work is proceeding, the exposed roots must be covered over with damp mats or straw. Presuming the drainage to be satisfactory and covered with turf for about 4 feet from the front wall, on the edge of this build a turf wall as high as the border will be when finished. This will leave about 3 feet for a new border in which to lay out the roots. First cut back any long, bare roots, then carefully complete the work as advised in the notes on planting. The best time to do this is towards the end of October, but it may be safely undertaken until the end of January. I would recommend that the vinery be kept cool until the vines start naturally into growth, say the first week in April. Disturbing the roots may cause the young leaves to droop slightly; if so, shade must be given for a time. As little fire heat should be used as possible. Syringe the vines frequently during the day, and in the evening as well; this will encourage the buds to burst. A healthy growth will result if the atmosphere is moist and warm and the house carefully ventilated. It often happens that the spurs and fruit buds on the stems of vines out of health have become irregular, weak, and partly withered. When this is the case it is necessary to select a strong growth as near the base of the vine as possible and encourage it to grow into a long cane, so that by repeated pruning back it will in the course of three or four years take the place of the old, worn-out stem. Towards the end of May many new roots will be found making their way into the new soil, then give a top-dressing half an inch thick of fresh horse manure, with a little soil added (one-fourth to three-fourths of manure). This will be of immense advantage to the vine. The following year the outside roots must be treated in exactly the same way. Where there happens to be only one border—whether outside or inside makes no difference—the same treatment must be carried out, only bearing in mind that it is advisable not to draw away the soil quite so near the vine stem as when there are two borders to deal with. These reduced new borders can be added to with fresh soil as soon as the space already provided is filled with roots. I have frequently seen vines brought from a most unsatisfactory condition into perfect health and fertility in a comparatively short time by adopting the method above described.

PROPAGATION

BY SEEDS.—There are various ways in which the vine may be propagated: one is by means of seeds, but this is rarely resorted to except when the object is to raise a new variety. It would take too long to raise vines in this way for ordinary purposes, and, moreover, one could not be sure of the variety being

true to name. Sow the seed in small pots, placing two seeds in a pot, the first week in March; put the pots in a warm house, water the soil, and cover them with a piece of glass. If the seeds are good it will not be long before the seedlings show above ground. The glass should then be removed, placing the plants near the glass to encourage sturdy growth. If the two seeds have grown, one seedling must be taken out of the pot as soon as it is large enough to get hold of, and thrown away or planted in another pot as the cultivator may decide. When the seedling is 10 or 12 inches high it should be repotted into a 7-inch pot. After firm potting return it to the same temperature and position near the glass. When the shoot begins to harden, as it will do towards the end of the summer, this is an indication that growth has ceased for the season, and maturation commenced. This must be assisted by the admission of more air and by a cooler temperature until, towards the middle of August, the young vine is placed in a sunny position out-of-doors, there to remain until winter frost and rains make shelter desirable. During wet weather the pot should be laid on its side to prevent saturation of the soil. The future of the seedling must be shaped as the grower desires; it may be either planted in a border during winter, or cut back to two buds in January and repotted in a 12-inch pot. It will make a strong cane in the course of the season if grown in the same temperature as advised for the seedling vine, and will bear fruit the year following.

Another method of propagating the vine is to tie a piece of turf to the spur immediately underneath the bud as it is about to break into growth. As the young shoot expands it will emit roots into the turf, which must, when full of these, be placed in a 6-inch pot filled with soil, and supported in its position by being tied to the trellis. The pot will soon be full of roots, then the shoot may be severed from the vine. The cutting away must be done gradually, severing the spur a little at a time. This mode of propagation is not often resorted to, but in cases of emergency it is often found useful.

By BUDS.—The best method of propagation, and the only one usually practised in England, is by means of buds or “eyes.” Cut out a piece of a shoot of the vine with a good bud in the centre. It should be $1\frac{1}{2}$ inch long, and the side underneath the bud cut away to the depth of about an $\frac{1}{8}$ of an inch. Insert it cut side downwards in a 3-inch pot filled with turfy loam, the bud being just visible above the soil. Secure firmly by well pressing the soil. It should be placed in the propagating house, or some other convenient structure where there is plenty of heat and moisture. It will not be long before the bud commences to grow, and at the same time roots will issue from each end and from the cut base of the shoot, filling the pot within a short time.

As soon as the young vine has filled its pot with roots, and is 10 inches or 1 foot high, it must be shifted into a 7-inch pot, using for this potting a soil composed of tough fibrous loam pulled into pieces the size of a pigeon's egg, with most of the loose soil sifted out of it. To a barrow-load of this add a 6-inch potful of bone dust, the same of quicklime, and about a peck of old mortar rubble broken to the size of marbles; when well mixed this makes an excellent compost for encouraging root formation. When repotted

the vines must be placed in a position where they can have abundance of heat, moisture, and light. Secure the young shoots to stakes as they grow. As little fire heat as possible should be used, although it cannot be dispensed with entirely, and the house closed early enough in the afternoon to make the temperature rise to 85 degs. Fahr.

Towards the end of June the pots will be full of roots: if wanted for summer planting in permanent vineries, the vines will then be ready for that purpose; if intended for winter planting, they must be grown on in the same pots and ripened in the autumn, as advised for the seedling vine.

The best time to start this work, in my opinion, is the middle of February. Then the days are longer, the sun is more powerful, and the buds will grow more strongly than if they were started in January. A word as regards the shoots from which the cuttings are obtained. These should be cut off the vines before Christmas if possible, tied in bundles, with the ends inserted in soil, and placed in a cold position until wanted. Better results are obtained from shoots thus retarded than from those cut from the vine just when required and when growth is about to commence.

By GRAFTING.—Where many varieties of grapes are grown in one house, it often happens a few years after the vines have been planted that the grower is disappointed with one or more of the varieties, and wishes them changed for more desirable sorts. There are two ways by which this can be accomplished without destroying the vine one wishes to get rid of; indeed, the vine to be discarded is requisitioned into service. The one is by a term known as “bottle-grafting,” and the other by “Inarching.” The former is accomplished by grafting the shoot of the new variety on the stem of the vine to be discarded, and is carried out in the following way:—About a foot above the base of the vine a piece, 3 inches long and $\frac{1}{2}$ of an inch deep, should be cut out. Have ready a shoot of the variety you wish to grow; it should be about a foot long; in fact, a shoot which is cut off at pruning time in the usual way. Below the second bud from the top of the shoot cut out a piece the same length and depth as cut from the stem; bring the two cut pieces together, taking care that they fit exactly, and with pieces of raffia tie them together securely, using plenty of raffia so that no part of the grafted stem is exposed to the air. The shoot should be long enough to allow some 6 or 7 inches to be free below the point of union, that it may be inserted in a bottle of water. It must be kept in this during the first season's growth, and the water occasionally changed. The best time to carry out this work is a month before the vines are started into growth, and the graft should not be interfered with in any way whatever until towards the end of June, when it must be looked to in case, through the swelling of the grafted parts, the raffia is cutting into the bark; before the matting is loosened three other ties should be made—one at each end, and one at the middle to make the graft secure. If this is omitted, and the graft separates, then all labour is lost. Therefore, take care that the graft is made secure before the original matting is taken away. If the work has been well and properly carried out as directed, the grafting should prove successful, and the union of the scion and stem securely and permanently

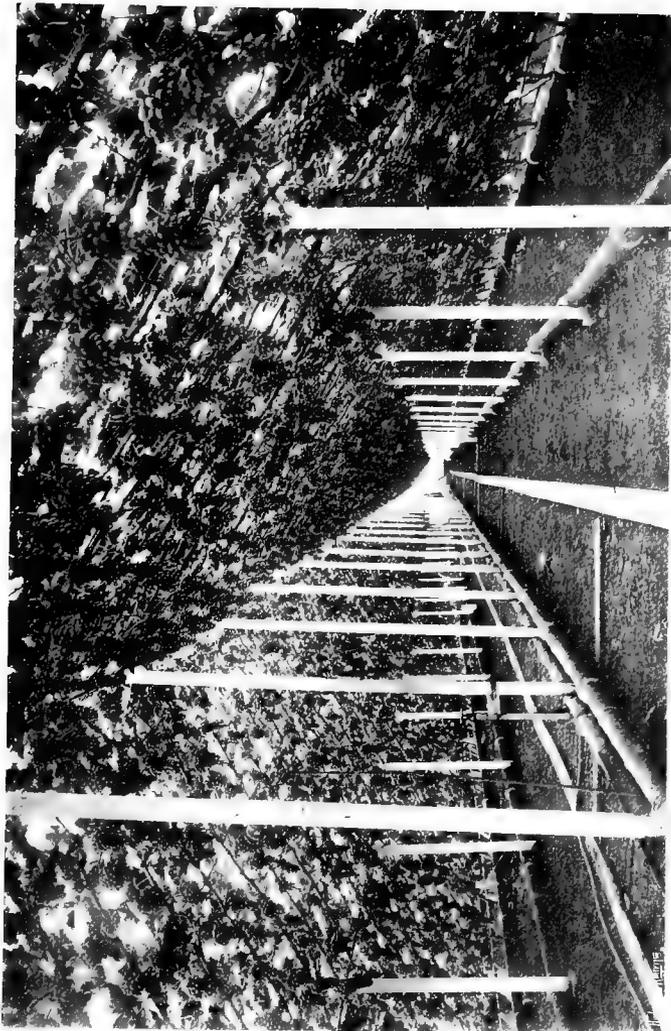
accomplished. One cannot be sure that the graft is securely joined to the stem until the parts have become hardened in the autumn. One only of the top buds of the grafted shoot should be allowed to grow, and in course of the season, if the grafting is successful, it will make a long growth, which in winter must be cut back to 12 inches or longer according to its strength. At the time of pruning, that part of the shoot inserted in the bottle of water must be cut away close to where grafted, as the water is no longer of use. As the grafted shoot increases in strength and size, so must the vine to be discarded be cut away to make room for it : in two or three years the new variety will take the place of the old.

INARCHING is of a similar nature, but is carried out in summer, when two green shoots are united in the same way as directed for bottle-grafting. In this case the variety one wishes to substitute for that discarded should be grown in a pot, and as soon as the young vine has produced a shoot large enough, it should be grafted upon a similar green shoot of the other vine, as near the base of the stem as possible. This is an excellent way of finding out expeditiously the value of a new grape, as by inarching a shoot it is possible to obtain fruit the next year ; whereas if the new vine were planted out in the ordinary way, it would at least take two years.

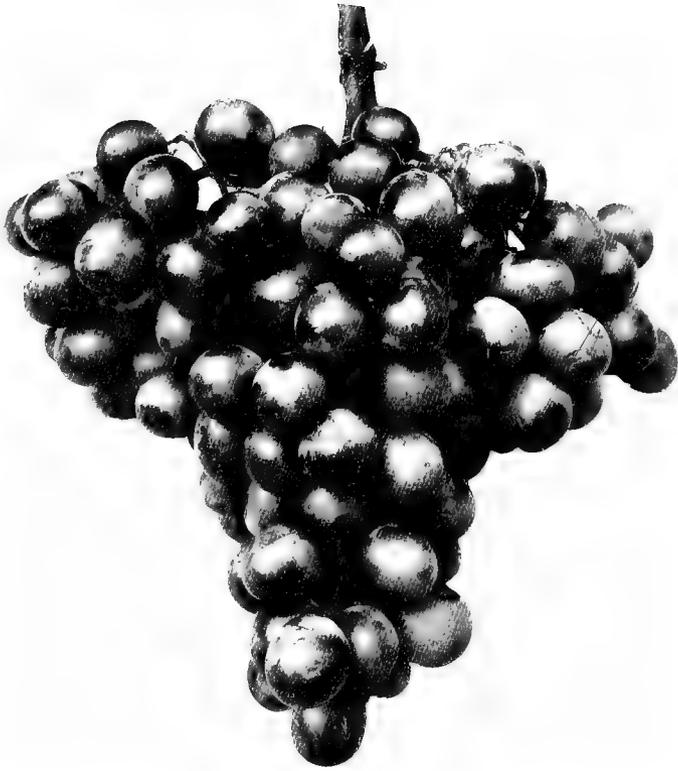
VINE CULTURE IN POTS

The cultivation of the vine in pots has been brought to perfection in this country ; many thousands are so grown every year. Eight or more bunches, weighing from 1 to 2 lbs. each, can be grown on a pot vine, and ripe grapes can be had in eighteen months after the bud is inserted in the small pot. When the vines are not unduly forced and the pots are placed in a narrow border of rich soil into which the roots can enter through the bottom and sides of the pots, as heavy a crop of good grapes can be grown in this way as can be produced on vines permanently planted in a border, but the pot vines are so exhausted as to be of no further use after the grapes are ripe, and must be thrown away. The pot vine is most valuable for the production of early grapes by forcing. By its aid we not only obtain excellent early grapes, but at the same time preserve the vigour and health of early vines for a much longer period. Without the pot vines early permanent vines would be forced much harder, and consequently would be worn out more quickly. The pot vine, carrying a crop of ripe fruit, with its richly tinted foliage of crimson and gold, is excellent for decoration. Instructions for the propagation of the pot vine are given in the general notes on the subject. We will suppose the young plants to have been potted into 7-inch pots.

As soon as the vines have again filled their pots with roots they should be repotted into 12-inch pots. The pots must be clean, and should have holes at the sides as well as in the base. The drainage should consist of clean broken crocks an inch deep with larger pieces placed over the holes. The soil should be as previously advised, excepting that the lumps of turf may be



ALICANTE GRAPE GROWN FOR MARKET.



GRAPE ALICANTE.

rather larger, and half a gallon of $\frac{1}{4}$ -inch bones to a barrow of soil may be added. It is better to repot the vines in the house where they are growing than to run the risk of damaging the foliage and checking their growth by taking them elsewhere. All the vines that were potted into 7-inch pots will not be large enough to put in the fruiting pots, so a selection must be made of the strongest. It is useless trying to fruit weakly ones the first year; only the vigorous will give a good crop of fruit the following season. I have seen so much harm result from the injudicious use of artificial manures that I hesitate to recommend their use except in very moderate quantities, and especially so in the case of the pot vine. The object of the cultivator should be to provide a soil that will best encourage root growth. Artificial stimulants can afterwards be applied safely in a liquid form.

In potting disturb the roots as little as possible. A few of the most prominent roots must be drawn out a little, so that they may at once come into contact with the new soil. As the soil is added make it firm. When potting is completed the surface soil should be less than an inch below the rim of the pot. No better place can be found for the pot vine when potted than an ordinary melon or cucumber house. When the vine is 8 feet long it should be stopped; this is long enough for all practical purposes for a pot vine of one season's growth. Lateral shoots as they form should be stopped at the second or third leaf. If the vines are in good health they will soon fill their pots with roots, and will need more water at the roots, indeed, on some very warm days they will require watering twice a day, and weak manure water should be given at least with every other watering.

The best stimulant I consider is fresh deer manure, and the most convenient form in which to prepare it is by placing it in a bag, sinking the bag in a tank of water. Where this is not to be had sheep or cow manure must be substituted, adding to it a small quantity of soot. An occasional change of manure is beneficial; for instance, weak guano water for a few days, taking care that it is well dissolved, and, again, some other reliable artificial manure may be used. I prefer to mix in the water before using rather than to spread the manure on the surface and wash it in. Towards the end of summer, provided all has gone well, the vines will be well developed and the wood will be hard, growth having practically ceased. When this is the case more air must be given and a cooler temperature maintained until the vines, towards the end of August, are placed in a warm and sheltered position out-of-doors, where the canes can be fastened to some improvised trellis to prevent their being blown about. They must still be carefully looked after as regards watering, and if plunged in ashes, so much the better, the roots will be cooler and more moist and less water will be necessary. After the leaves have fallen and winterly weather is probable, they should be removed to a light shed or some other cool structure, and there remain until wanted to start into growth again, taking care not to expose the pots to frost. To grow a pot vine from a bud in one season strong enough to produce a crop of fruit the following year is not easy, still it is quite possible. The majority of pot vines offered for sale are really two years old, that is, they are grown in 7-inch pots the first year,

cut back to one bud close to the ground and grown on again the following year, when, as a rule, they make strong useful canes by the end of the season.

VARIETIES OF GRAPES

BLACK

BLACK HAMBURGH.—There are several distinct varieties of this grape, and at least three are sufficiently so to receive different names. These are the Black Hamburg, the Frankenthal Hamburg, and the Mill Hill Hamburg. Soils and conditions of growth so often alter the appearance of grapes that if these three varieties were grown under different conditions and shown together it would be difficult to recognise any one. However, all three are excellent. The true Black Hamburg is the old Hampton Court vine. The bunches and berries produced on this veteran tree are small, it is true, but for richness and sweetness of flavour they surpass any other Hamburg I have tasted. This variety is not so large in berry or so heavy in bunch as the other two.

FRANKENTHAL HAMBURGH.—Is distinguished by its noble-looking bunches, immense berries, and their dense black bloom. It is vigorous, and regularly bears heavy crops. Dr. Hogg gives the following description of the berries: "Roundish, frequently oblate, sometimes hammered and scarred; skin thick, adhering to the flesh; deep black purple; flesh firm, and often forming a hollow cell round the seeds, juicy, sugary, sprightly, and richly flavoured." This is an excellent description of the variety, as I can testify from my experience of it at Chatsworth, where the true Frankenthal is grown.

MILL HILL HAMBURGH.—At Chatsworth the true form of this also was grown. In some respects it is the best of the three. For rich flavour it is almost equal to the Black Hamburg; in size of berry and bunch it is as large as the Frankenthal, but does not colour so well or develop so dense a bloom. The foliage of this vine is easily distinguished by its large size and generally drooping appearance. For summer and autumn dessert there is no black grape, taking it in all respects, to equal Black Hamburg. It is also one of the easiest grapes to grow—the ideal grape for amateurs. By hard forcing it may be had ripe at the end of April, and by retarding the growth of later vines it may be had in good condition at Christmas.

MADRESFIELD COURT.—As a black grape this unquestionably comes next in point of merit. Some would even place it before the above. When well grown and properly finished it is extremely handsome, and certainly one of the best exhibition varieties of the day. It was raised at Madresfield Court by the then gardener, Mr. Cox, and is said to be a cross between "Muscat of Alexandria" and "Black Morocco." The bunches are long and tapering, the berries large and oval, and when grown to perfection the bloom upon them is intense and beautiful. As a rule the bunches weigh from two to four pounds each. The flesh is tender, greenish, rich, juicy, and distinctly Muscat flavoured. It is an easily grown grape, yet many find a difficulty in overcoming the tendency the berries have of cracking when almost fully developed. I have not experienced difficulty in this respect myself, in consequence, I believe, of well cropping the vines and having more or less air on the house night and day just before the grapes colour, with a little heat in the pipes. It is a summer and autumn grape, and not recommended for winter and spring.

MUSCAT HAMBURGH.—For high quality and richness of flavour this variety is unsurpassed, and when grown to perfection one of the most handsome black grapes. Grand for exhibition, where it will always carry maximum points when well shown. It is, however, difficult to grow, and is therefore only sparingly cultivated. It should be grafted on the Black Hamburg or Muscat of Alexandria.

GROS GUILLAUME.—Often misnamed Barbarossa. This is a well-known, handsome grape, not so commonly or so well grown as it used to be years ago. It is one of those varieties that will not succeed under the close-pruning system; when pruning, the shoots must be left 6 or 7 inches long, with several buds. The extension system of culture is recommended; the bunches are often 2 feet long and 18 inches across the shoulders.



GRAPE LADY HUTT.



GRAPE GROS COLMAR.

The berries are round and of a good size, and when well grown take on a lovely bloom; the flavour is sweet and refreshing. It is a late grape, and its best season is January. Not an amateur's grape.

BLACK PRINCE.—A grape now seldom seen or heard of. Thirty years ago none was more frequently seen on the exhibition table. The bunch is long and tapering, the berries of medium size and covered with dense blue-black bloom. The flavour is crisp and sweet. It is an easily grown grape, and succeeds well in an orchard house.

MRS. PINCE'S BLACK MUSCAT.—This is a late grape of the finest quality, and a true Muscat. The vine is hardy and a good bearer; it "sets" freely, but as a rule it does not colour satisfactorily, always finishing off with a greenish-black hue, not at all attractive or pleasant to look at. Hence it is seldom grown.

BLACK ALICANTE.—A standard late grape for private or for commercial use. It is the easiest of all grapes to grow, and no grape we have will give a more generous return for the little attention it needs. It is the amateur's grape in winter as is the Hamburgh in summer. The bunches attain a large size under good cultivation, and so do the berries, and these carry a perfect bloom. When this grape is perfectly ripe the flavour is refreshing and sweet. It will keep in good condition until April if the shoot cut with the bunch is immersed in a bottle of water and placed in a cool, dark fruit-room.

GROS COLMAR.—Dr. Hogg's description of this grape (as given in the "Fruit Manual") is so good that I quote it: "Bunches very large, berries very large, skin rather tough, adhering closely to the flesh; dark purple or black; flesh coarse, juicy, and sweet, and of a flavour that cannot be called either rich or agreeable." When well grown and properly finished this is certainly one of the noblest-looking grapes we have, and there is no wonder that on account of its good looks the public prefer it to all other late black grapes, ignoring its comparatively poor flavour. In consequence of this patronage of the public it has become the market grape *par excellence* for winter dessert. There are hundreds of tons of it grown in the neighbourhood of London alone. This and Alicante are the two best market grapes of the day. To grow Gros Colmar to perfection it requires a long season and a good command of artificial heat to help ripening early in the autumn. The flavour improves by keeping; will keep in good condition even longer than Alicante.

GROS MAROC.—This is a grape not unlike the above in appearance, but the berries are oval and ripen earlier. The bunches are usually lumpy, the berries very large; the bloom on the berries is intense and of a purple-black hue. The flavour is refreshing and sweet, but not particularly good. It is a variety that colours very quickly, and for this reason is favoured by some gardeners as a useful sort for late summer and early autumn for exhibition purposes. It does not keep so well as Gros Colmar.

ALNWICK SEEDLING.—A handsome late exhibition grape, of moderate quality. It crops freely, and needs to be fertilized with Black Hamburgh pollen. The flavour is peculiar and liked by many.

LADY DOWNE'S SEEDLING.—The latest grape of all, keeping well in the grape room until the end of May or even into June, when fresh grapes are again ripe and plentiful. For consumption in February, March, and April it is a very valuable variety. At that late period its quality and flavour are excellent. The flesh is firm and juicy, the flavour rich, sweet, and most pleasant; the best flavoured late black grape we have. This variety is a good grower and prolific, but the bunches and berries are not so handsome and large as some other late grapes; for this reason it is not remunerative for market culture. Its size and appearance may be improved by grafting on Muscat of Alexandria.

WHITE AND GOLDEN GRAPES

MUSCAT OF ALEXANDRIA must take precedence. It is not too much to say of it, when exhibited in perfect condition and of a beautiful transparent amber colour, that no grape is so well liked or so much admired. The variety offers no serious difficulty in the way of successful cultivation. It bears as heavily as any variety we have, and if carefully looked after and not overcropped, lives to a good old age, especially if the extension system of culture be adopted. The house in which it is grown should

be provided with more hot-water pipes than is usual for ordinary grapes, for when the vines are in flower, in order to secure a good set of fruit a rather high temperature is an advantage. Again, during ripening it is of great value to be able to give increased heat with plenty of air. Without this help and the precaution of not overcropping, it is impossible to secure the best results. Immense quantities of this grape are grown for the London market, and it is in season from the end of June to the middle of March. It commands the highest price in the market. The vine is rather subject to red spider. This is its greatest enemy, and every precaution must therefore be taken to prevent its appearance. When possible it should have a vinery to itself. There are two other distinct and excellent golden Muscats: one is Bowood and the other Canon Hall. The above remarks as regards culture will apply equally to the requirements of these two.

BOWOOD MUSCAT is a stronger grower, and is hardier than Muscat of Alexandria. The berries are slightly larger and rounder in shape, but the flavour is not so rich or sweet.

CANON HALL.—This is a distinct and handsome grape, a seedling from Muscat of Alexandria, which it resembles, excepting that the bunches are much longer, and the berries larger and rather rounder in form. Considerable skill is required to grow this grape successfully, the chief difficulty being to obtain a proper set of fruit. It has not the rich and exquisite flavour of Muscat of Alexandria.

FOSTER'S SEEDLING.—This, as a white grape, is the sheet anchor of the vine grower who wants early white grapes. It forces as well as, or better than, the Black Hamburgh, and both succeed under the same conditions and treatment. Flavour sweet and refreshing.

BUCKLAND SWEETWATER.—This is a handsome summer grape of refreshing and delicious flavour. It also forces well, but for early forcing Foster's Seedling is preferable.

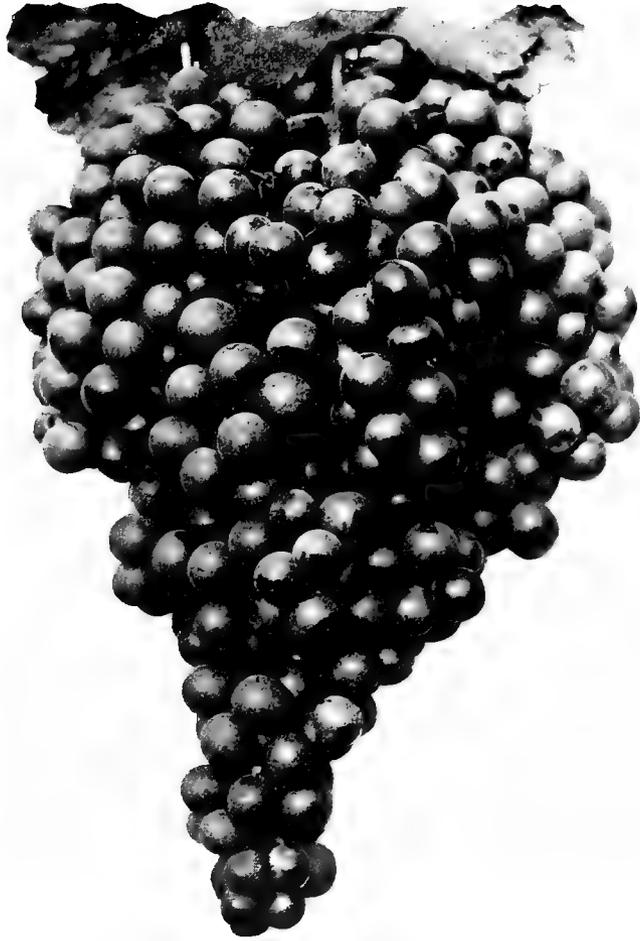
GOLDEN HAMBURGH.—In size of bunch and berry this resembles Black Hamburgh. It is one of the most handsome golden summer varieties, a beautiful amber colour when ripe. The flesh is melting and juicy, the flavour rich and very sweet. A fine exhibition variety and easily grown, but will only remain in good condition a short time after it is ripe.

DUKE OF BUCCLEUCH.—The largest-berried white grape; when grown to perfection strikingly handsome. The berries are very large, globular, and of a beautiful pale amber colour. It is not so generally grown as it ought to be, and this is accounted for by the fact that it is not a consistent cropper. I think its occasional failure to produce a crop is due chiefly to the proper method of culture not being understood. It makes strong and sappy growth, and should occupy a light warm house facing south, so that ripening of the wood is assured. It must be grown on the extension system. It is useless to expect good crops of fruit from this variety if the spurs are pruned back to one or two buds. It is a summer and autumn grape, and must be served for dessert as soon as ripe. The berries become spotted and decay at the stalk if kept long after they are ripe. It should be grown in a shallow, porous border, receiving plenty of water in summer, and the border in winter should be well protected from excessive rain.

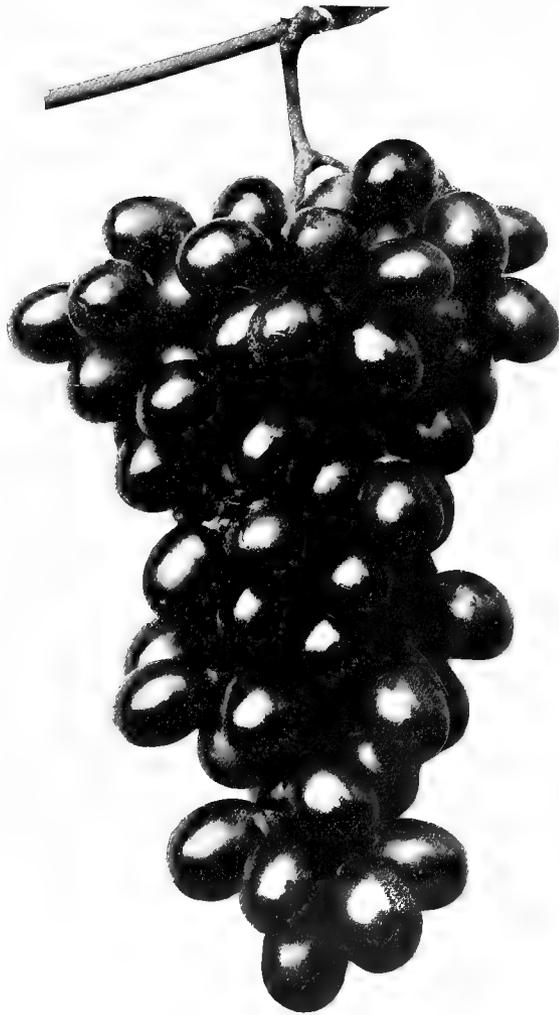
GOLDEN CHAMPION.—This is the result of a cross between Mill Hill Hamburgh and Bowood Muscat, and, like Duke of Buccleuch, was raised by the late Mr. Wm. Thomson, of Clovenfords. It has large oval berries, and the bunches are usually more symmetrical and larger than those of Duke of Buccleuch. Of the two I prefer the latter. The same method of culture suits the two grapes.

CHASSELAS NAPOLEON.—This is a handsome variety well worth growing in any collection of amber-coloured summer or autumn grapes. Like Madresfield Court, its berries are apt to crack before ripening. Free ventilation, fair cropping, with warmth in the pipes, will obviate this. Flavour sweet, juicy, and refreshing.

MRS. PEARSON.—This is a variety that is in cultivation to a limited extent only. Its flavour undoubtedly entitles it to rank among the best, but unfortunately it is not of attractive appearance when ripe. The bunch attains a good size, and is symmetrical. The berries are of medium size, but of a dingy, opaque, amber colour, not at all pleasing to look at. The flesh is firm and the flavour rich. It requires Muscat treatment.



GRAPE GROS GUILLAUME.



GRAPE MADRESFIELD COURT.

There are other amber-coloured late grapes of imposing size and handsome appearance. For instance, Child of Hale, Raisin de Calabre, Trebbiano, White Nice, Syrian, Tokay, and others were formerly much grown. They were all very well in their way, and satisfied the craving for large bunches, but they have not the same value for dessert as moderate-sized bunches, and the flavour is not first-rate. The best is Tokay, a variety that is still worthy of a home in a collection of winter grapes.

SOME NEGLECTED GRAPES

It will, I think, be generally acknowledged that for rich and delicious flavour the Frontignans must be placed first. Of these there are several varieties, the best of which are the following three: the Black, Grisly, and White. They are a very modest trio as regards size of vine, bunch, and berry, and also as regards their cultural requirements. They succeed best in moderately poor soil of a porous nature. They are not expensive to grow, and succeed well with little or no artificial heat; their foliage is small, and occupies but little space.

BLACK CLUSTER.—This crops very freely and is a good setter. Its bunches are rather small but very compact. Berries oval and black. Flesh firm, juicy, and sweet, and of good flavour. Suitable for outside walls.

BLACK FRONTIGNAN.—A good free-cropping variety of excellent flavour. Its bunches and berries are of medium size, round, and black. Flesh firm and juicy.

BLACK MONUKKA.—This produces large bunches and berries, but the flavour is only third-rate, and not to be recommended.

CHAPTAL.—A white grape, not unlike Golden Hamburg. It forms handsome bunches of good size and flavour, but the flesh is very soft.

CHASSELAS NAPOLEON.—This is one of the best, and deserves to be more extensively grown. It forms a handsome bunch, is a free setter, and the flavour is excellent. Berries oval, of medium size, becoming pale golden when ripe.

CHASSELAS ROSE.—This variety is remarkable for its excellent flavour, not unlike Muscat of Alexandria. Its bunches are large and compact, with large round pale yellow berries. Flesh juicy and sweet.

CHASSELAS ROUGE forms a medium-sized somewhat loose bunch. The berries are small, tawny red, very juicy, and sweet.

FERDINAND DE LESSEPS.—This is a very small, pretty, and deliciously sweet amber-coloured grape, not unlike Royal Muscadine in size of bunch and berry, but the colour is more golden. This is one of the parents of Mrs. Pearson, and, like it, possesses a distinct, sweet, and refreshing flavour, not so rich as that of the Muscat, but richer than the ordinary Sweetwater. This is the result of a cross between the Strawberry Grape and Royal Muscadine.

MADEIRA FRONTIGNAN.—This produces medium-sized compact bunches with reddish purple berries. Flesh juicy and sweet, and of good flavour.

MEURTHE FRONTIGNAN.—This is of excellent flavour, which very much resembles the Muscat. It has medium-sized bunches, with large round berries, which are quite black. Its flesh is very firm and sweet.

PRUNELAS is a fairly good black grape, of medium size, and a good cropper. The flesh is firm and sweet, with a peculiar but not unpleasant flavour.

ROYAL MUSCADINE.—This does remarkably well out-of-doors on a south wall. It develops fairly large bunches. Berries large and round, which when ripe are a beautiful amber. The flavour is rich and delicious.

SALAMON'S FRONTIGNAN is of medium size both in berry and bunch. It is a white grape of a somewhat Muscat flavour.

SAN ANTONIA.—This produces fine bunches, somewhat resembling Madresfield Court in appearance. The berries are purplish black, large, and oval. Flesh tender, juicy, and sweet, with good flavour. Like Madresfield Court, it is a bad keeper.

STRAWBERRY GRAPE.—The shoots, leaves, and bunches are small, and the berries only the size of a good black currant, as black as sloes, with a deep purple bloom. It is impossible to describe the flavour; it is a mixture of Muscat, Frontignan, Pine, and Strawberry. An American grape.

SYRIAN.—This is a strong grower, and produces immense bunches. Berries large, oval, and pale yellow when ripe. Flesh very firm and sweet. It is a good late grape, and keeps well when properly ripened.

WEST'S ST. PETERS.—As a late grape this has much to recommend it, especially to those who prefer quality to size and appearance. The berries are rather small and black. The flavour is brisk and pleasant. This grape is in season until the end of February.

All the above are easily grown in cool houses, except West's St. Peters, which requires a high temperature to develop it perfectly.

GRAPES OF RECENT INTRODUCTION

The varieties of grapes already in existence are so numerous and so excellent in every respect that there is scarcely any room left for a new improved variety. Moreover the raisers of such have usually some difficulty in turning it to profitable account. However, several new ones have been raised during recent years, but not one, so far as I know, of superlative excellence. Among the best are Lady Hutt and Appley Towers. These have proved themselves to be useful acquisitions, and are now well established in public favour. Lady Hutt is a white late variety of good flavour and appearance, and will keep a long time. Appley Towers is a late black variety, intermediate between Gros Colmar and Alicante. It is as free bearing as the latter with rather larger berries, and it colours better and much easier than Gros Colmar. The following also have been put forward as aspirants to public favour, but their value has not yet been sufficiently established for us to recommend them to our readers: Lady Hastings, Black Duke, Diamond Jubilee, and Prince of Wales.

VINE CULTURE IN COLD HOUSES

We have several excellent varieties of grapes that can be grown successfully in an unheated vinery, provided the border has been well made, the vines carefully planted, and that they receive reasonable care and attention afterwards. When no fire heat is available the vine grower will need to exercise much care in controlling the ventilators, bearing in mind that he has to depend entirely on sun heat for the development of the vines. It is only by the intelligent and careful regulation of the ventilators that most can be made of sun heat. The details of work during the season of growth will be practically the same as recommended for the vine under the usual conditions. It is important not to hasten the vine into growth early in spring on account of the cold nights at this time of year. The 1st of April is a good day on

which to close the vinery. This term "closing the vinery" is well understood amongst gardeners. To the amateur I would say that it refers to the first occasion on which heat is applied to the vine to cause it to commence growth. The ventilators should be closed early enough in the afternoon to make the temperature rise to 75 degs., or even 80 degs. for an hour or two. It will soon cool down. A reliable thermometer must, of course, be fixed in the vinery, and in such a position that the sun cannot possibly shine on it, or it will not indicate correctly the heat of the atmosphere. The thermometer must be carefully watched, as it will be the compass, as it were, by which to steer the vines to a successful issue. Before the house is closed the vines, walls, and borders should be well syringed. In the morning, as soon as the thermometer registers about 60 degs., a little top air must be admitted; later, towards 9 A.M., as the sun gains power, more top air must be given, so that the temperature shall not rise higher than from 70 to 75 degs. It is better not to open the front ventilators at all until danger of cold winds has passed away, and only a little even then if the temperature can be kept within limits by means of air admitted through the top ventilators. As the season advances and the air becomes warm, the same caution is not so essential in regard to front ventilation, but the grower must always bear in mind that it is sun heat only he has to depend upon to develop and ripen the crop. Never forget to close the vinery after syringing in the afternoon in time to make the temperature rise to 75 or 80 degs. Fahr. A supply of water must be kept in the house, so that it may be warm. Syringing with cold water might check growth. The following varieties are excellent for this purpose:—(BLACK) Black Hamburgh, Madresfield Court, Black Frontignan (small), Early Royal Ascot, Black Alicante, Black Prince; (WHITE) Golden Hamburgh, Foster's Seedling, Buckland Sweetwater, Ferdinand de Lesseps, Royal Muscadine, Chasselas Napoleon.

GRAPE CULTURE FOR MARKET

During the past few years the culture of grapes for market has undergone great changes. Many acres of land are now covered with glass-houses, principally in the north of London, the neighbourhood of Worthing, and in the Channel Islands, and the supplies sent to market are enormous. Twenty or thirty years ago grapes fetched regularly as much as 20s. or 25s. per lb., 5s. or 10s. per lb. were considered quite ordinary prices. In 1896 Mr. Peter Kay wrote that the prices obtained varied from 6d. to 5s., and those now ruling are even lower still. Mr. Kay's remarks in a paper read before the Horticultural Club, and reprinted in *The Garden*, upon how to start a market nursery, are worthy of reproduction: "That land is best which has soil 2 to 3 feet deep, resting upon a subsoil easily drained. There should be ample means for obtaining an abundance of water, and equally ample means for getting rid of the same. Whether the land is pasture or arable is not vital, but, of course, preferably pasture; then its closeness to means of communication must be considered, especially with regard to fuel and carriage of produce to market, and these things may vary so much in different localities that, with

all the best conditions appertaining to it, an acre may be cheap at £300, where in another locality it would be dear at £100. Other things being equal with regard to the fitness of vine growing for profit, it is wise to give preference to land likely to improve into building land. We will suppose the enterprising grower has secured land he thinks suitable for the purpose, then he will proceed towards the erection of the vineries. Early autumn would probably be the best time to begin, so that the houses might be glazed in readiness for the early spring. The first glass to build is a propagating-house supplied with bottom heat. Then the grower must think of the sorts of vines to grow, whether Hamburgh, Alicante, Gros Colmar, Muscat of Alexandria, and, if he is of a speculative turn, Canon Hall. These varieties are nearly the only ones that a commercial grower ought to go in for. The other varieties that are grown in less quantities are Madresfield Court and Gros Maroc. Appley Towers and other new sorts remain to be proved ; but the beginner must not experiment too much, but grow tested sorts. In my opinion, Alicante, taken as a whole, has been the most profitable variety to grow, not even excepting Muscat of Alexandria and Canon Hall. My own experience is that, taking houses of equal size, one planted with Alicante, one with Gros Colmar, and one with Canon Hall, and taking, say, five years' results of sales, Alicante would come out best, Gros Colmar next, then Muscat of Alexandria, and last, Canon Hall. This is against the general belief, but is true in my experience, for Muscats hardly make up for the lesser weight obtained from them ; then there is the extra waste in marketing, and their special liability to red spider and shanking. The grower of vines for profit must erect his glass-house with the greatest economy, and with no further idea than that of covering in the greatest area with glass upon the simplest system consistent with strength and practical usefulness."

If ground can be secured where there is a good depth of loam, a considerable saving of labour will be effected in making the vine borders. In a nursery in Scotland where grapes are grown for market, the land is so well suited to the growth of the vines that they are simply planted in the natural soil, there is no made border whatever. It is only in exceptional situations, however, that this is possible. Mr. Kay's remarks as to the vine borders, &c., are also well worth studying : "With regard to the profitable life of a vine, it may vary from ten to twenty years, according to the sort of border that is made. Houses built together with only inside borders will not carry the vines through more than ten years profitably ; whereas when they can root in well-made outside borders, their life and vigour are doubled. What I specially mean by outside borders is, not that the vines should be planted outside and introduced into the house through the wall, as was the old practice, but that the border should be both inside and out, the front of the house resting on piers or arches. Then, by planting the vines inside, a far better start is assured, and they will soon ramble outside, where the sun and air more naturally prepare a congenial place for them. The market grower makes the best use of the material he has at hand, and in some cases where the soil is very heavy adds to it London manure for the sake of its mechanical effect, and bone-meal of first quality. A



ALICANTE GRAPES IN BABY BASKET.



BABY BASKET PACKED IN HAMPER FOR MARKET.

commercial vine grower does not often use $\frac{1}{2}$ -inch or larger bones, as a quicker return is possible from more soluble bone-meal. Moreover, cultivators do not so much rely on the depth and richness of soil as upon frequent top-dressings, thus encouraging the roots near the surface. The drainage of a border is very important, and it must be of such a nature as not to allow stagnation, or so free as to permit the border to be much weakened. The practice of the future will probably be towards shallower borders, *i.e.* not exceeding 2 feet 6 inches in depth.

“Other plants are nearly always grown in the houses until the vines come into bearing, and at the present time tomato culture is largely practised. The grower, therefore, as well as raising young vines ready for the spring, must arrange for having tomato plants ready also. If it were not possible while the vines are growing to tide over the first two years with other crops in the houses, it would be much more difficult than it is to establish a vineyard under glass. The young vines properly grown should be about 2 feet high by the middle of May, and then is a good time to plant them in the border which has been prepared for them. At the time of planting bone-meal is a good dressing to mix with the soil, and short manure should be used as a mulching on the top. They will require careful and constant attention until they make new roots, and abundance of clear water during the growing season through June, July, and August. By the end of August growth ought to be discouraged, and the vine led more to develop the wood already made. When vines are strong at planting time, and given liberal treatment through their first year, they sometimes grow 20 and even 25 feet long. Indeed, I have seen vines cropped the first year after planting bearing 10 lbs. of fruit. But this is not wise where the establishment of permanent vines is intended, as the loss of vigour can be noted in such vines for years afterwards.

“There is one aspect in vine culture that requires careful weighing from its commercial side, and that is the question of extension *v.* restriction. I am bound to say that the extension system of culture affords in the end far better results. How often it occurs to one that our mechanically constructed houses impose restriction even on vines treated under what is called the extension system. When a vine attains the age of four years, it would easily, with benefit to its health and wealth, double itself in one season if the structure which covers it could be enlarged there and then. Constitution is the chief thing to strive for in cultivating the vine, and this leads to the thought of fertilisers for the vine. First get constitution, and then we may proceed to intense culture. The many artificially compounded mixtures recommended as concentrated food for the vine are mostly very well suited for it, and for some localities they may even be perfect; but where localities differ so much in the character of their soil and other conditions, universally to apply one mixture would be folly.

“It is difficult conscientiously to give a rosy aspect generally to the business of grape-growing under the conditions as they are at present, and I cannot fairly estimate that in the future there is any likelihood of a rise in the price of grapes. No doubt there will be always good and, indeed, remunerative prices

for the very best samples, but we all know that such first grade fruit is a small proportion of the great bulk sent to market."

PACKING GRAPES FOR MARKET.—This is an important matter, for grapes usually have to travel some considerable distance before reaching market, and it is very essential they should arrive in the best of condition. The bunches are usually cut with a portion of the shoot attached; this may be left about 4 inches long. Various kinds of baskets are used, but those in general favour are known as "baby" baskets. As a packing material, wood shavings, or "wood wool," as it is sometimes called, is used. A little of this is placed in the baskets, and then covered with white or pink tissue paper. The finest bunches are laid around the sides of the baskets, and the stems are made secure to the basket rims. They must be close together so that they do not move. Twelve pounds of grapes is an average weight for a basket, some are more, some less; but the exact weight is given with the basket before the fruit is sent to market. When the baskets are packed they are placed in flat hampers specially made to receive them. They are of such a size that the "baby" baskets just fit into them, thus preventing any possibility of movement. The illustrations given of the baby basket packed, and also placed in the hamper ready for travelling to market, will give a good idea of the method employed. Some of our best grapes now go to America, and find a good market there. A few years ago a brisk trade was also commenced with France, but the heavy duties imposed have practically closed that market to English grapes.

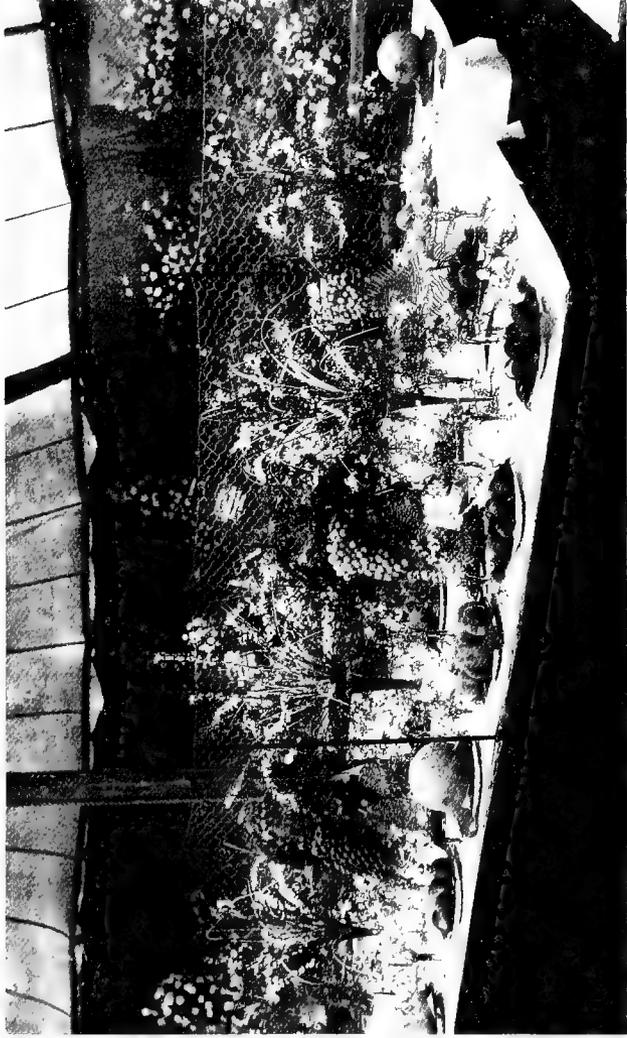
FERTILISATION.—The flowering of the vine is easily detected by the delicious scent given off as soon as the cap which covers the stamens of the flower falls. Usually fertilisation will take place without artificial aid. While the vine is in flower the atmosphere of the house should be kept dry and warm. In the course of a week after the first flowers appear, all the vines will be in bloom, and in another week the berries will have formed and be ready for thinning. It is a good plan to shake the trellis once or twice about noon to distribute the pollen and make sure of its coming in contact with the stigmas, thereby securing proper fertilisation. With some few varieties of grapes perfect fertilisation of the flowers cannot be effected without artificial help. The Muscats are instances. Muscat Hamburgh is the most shy "setter." Canon Hall also "sets" badly. To help such varieties to "set," draw the hands over the flowers, thereby removing the capsules and liberating the pollen. Also collect some pollen as it falls in a piece of paper, and throw it back with some force against the bunch. Should Black Hamburgh or some other free "setting" variety be in flower at the same time, better results will follow by using its pollen on Muscats.

GRAPE THINNING.—The first thing to do after obtaining a good "set" is to reduce the number of bunches to as many as the vine may carry, of course selecting those likely to be the most symmetrical. Thinning the berries must then be commenced. At the first thinning the berries of all varieties may be thinned to half an inch apart. At the second thinning discretion must be exercised and the particular variety considered. Before the worker puts scissors to bunch at all he must learn to differentiate between the fertilised and the un-



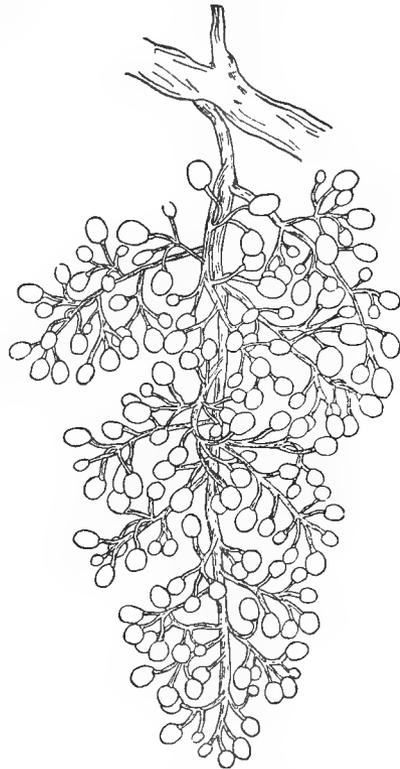
A CHAMPION EXHIBIT OF GRAPES AT THE SHREWSBURY SHOW.

W. H. & G. S. 1911



A DECORATED DESSERT TABLE AT SHREWSBURY SHOW.

fertilised berries. This will be apparent in the course of a few days, as the latter will remain small, while those fertilised will, even in the course of a day or two, make appreciable progress. It goes without saying, therefore, that the small berries must be cut out first; afterwards any berries that cross one another in the centre of the bunch, leaving them, as I said before, half an inch apart. The best way of keeping the bunch steady while thinning goes on is to select a berry towards the base of the bunch which can be spared after the bunch is thinned, and take hold of it with the left hand, pulling downwards slightly until the work is done, afterwards cutting off the berry, as it would be tarnished and of no use. This answers excellently for small bunches, but for long ones and those with heavy shoulders a forked stick is necessary. There is a special make of scissors for the purpose, in several sizes; I prefer the small ones. They must be kept sharp and clean, so that no pulling at the berries with blunt blades or tarnishing them with dirty ones may take place. The bunch must not be turned round to suit the worker's position, but he must move round the bunch, taking care not to touch the berries with the head, hands, or clothes, or they will be disfigured permanently. After the first thinning is over the grapes will swell rapidly, and it will be necessary to go over the bunches again; if, however, the first thinning is carefully done there will not be very much to do afterwards. If the grapes are forced early the berries will not be large when ripe, so that this must be remembered when thinning and the berries left more thickly. With mid-season and late grapes a greater distance must be left between each berry, varying according to the ultimate size. Gros Colmar, Gros Maroc, and the Duke of Buccleuch, for instance, require double the space sufficient for smaller varieties.

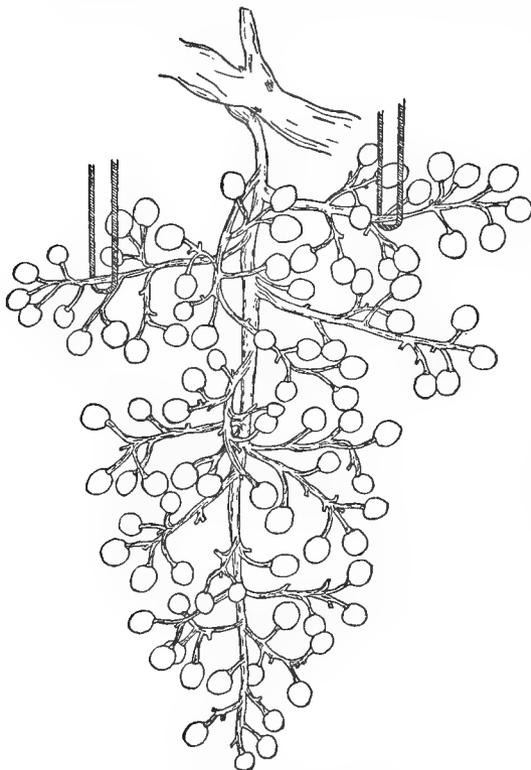


BUNCH OF GRAPES NOT THINNED

In thinning a bunch of grapes the worker should have in mind a picture of the bunch as he would wish it to appear when fully developed. In growing grapes for exhibition it is especially important that the berries should be thinned carefully. When fully developed they should rest firmly upon one another without undue pressure. It is as easy to err by leaving too many berries in the bunch as in having too few. The way to avoid this is carefully to observe the bunches as the berries swell, and to remove a berry from that

part of the bunch where undue congestion is noticed. The removal of one berry will often cause relief to half-a-dozen.

PERIOD OF STONING.—This takes place when the berries are little more than half-grown, and then the temperature of the vinery should be reduced by 5 degs. and more air admitted. The “stoning” period is indicated by an arrest in the



BUNCH PROPERLY THINNED

growth of the berries; they appear hardly to increase in size for a fortnight or three weeks; by occasionally cutting through a berry the progress in the formation of the stone may be observed. All the varieties that I know, excepting Lady Downe's Seedling, will pass through the stoning period without trouble. The skin of the berries of this variety is then very liable to be “scorched,” a term used to express damage to the berry causing it to shrivel slightly and turn black, a damage that is fatal to the quality and appearance of the grape. The best remedy for this, as I said before, is more air, not only during the day, but a little must be admitted both through the top and bottom ventilators during the night.

THE RIPENING PERIOD.—The berries of the grape grow most rapidly during the time between the completion of stoning and full development, and the grower then must be on the alert and take care

that the vine does not suffer from want of water at the roots or from insufficient moisture in the atmosphere. It is a good plan to give a top-dressing (2 or 3 inches deep) upon the inside border of fresh horse manure (with a little soil added). It is wonderful how quickly the surface roots multiply in this material, and the atmosphere is more or less enriched by the ammonia emitted. Before the final swelling of the grapes the grower will do well to consider whether the crop is too heavy for the vine to develop perfectly. If he thinks it is, then a few bunches should be removed before it is too late. It assists the development of the berries to damp the house at closing time with liquid manure diluted with water. But the greatest aid to

the perfect finish of the bunch and berry at this period is an abundance of sturdy, large, and healthy foliage; without this the best grapes cannot be grown. Therefore every effort must be directed not only to produce such leaves, but also to protect them from harm by the ravages of insects. I have before given directions as to the importance of the timely and systematic stopping of all sub-lateral growth at the second or third leaf; they should not be allowed to grow wild, as is often the case, and then be cut out in armfuls at a time. But if the best leaves of the vine are seriously damaged by red spider or from any other cause, then the sub-lateral growths must be encouraged, as it is useless to expect perfect development and finish in the absence of an abundance of foliage, and this is particularly so in the case of black grapes. Some moisture in the atmosphere may be given until the grapes are partially coloured; it must be then gradually diminished, finally keeping the vinery perfectly dry, admitting air when the weather is favourable, and having the pipes warm. When one desires to hasten the ripening of Muscats for exhibition or other purposes, this may be effected by tying back some of the leaves and partially exposing the bunches.

STORING GRAPES.—As soon as Christmas is past all late grapes hanging on the vines should be cut off with a piece of shoot (below the bunch) attached, long enough to insert in a bottle of water or some other receptacle provided for the purpose. In many gardens grape-rooms, properly fitted up, are provided. In smaller gardens where these are not available grapes can be kept well for months by placing the shoot attached to the bunch in a bottle of water and fixing the bottles on a rack, similar to a wine rack, but with a piece of wood at the edge to raise the neck of the bottle slightly so that the water will not run out. A cellar or room where the temperature never falls below 45 or 50 degs. Fahrenheit, and where it is dark, will suit admirably. A very dry room must be avoided, for evaporation would be too rapid. The water in the bottles must be changed occasionally and kept perfectly fresh; a piece of charcoal put in is a useful means to this end. The bunches should not be placed too closely together, and should be examined once or twice a week to see that there are no decayed or decaying berries; these when found must be carefully removed at once.

APPROXIMATE TEMPERATURES FOR EARLY FORCING

	<i>Maximum (by Day).</i>	<i>Minimum (by Night).</i>
November . . .	from 57 to 62 degs. Fahr.	from 54 to 57 degs. Fahr.
December . . .	„ 60 to 64 „	„ 55 to 58 „
January . . .	„ 65 to 68 „	„ 57 to 60 „
February . . .	„ 68 to 71 „	„ 60 to 63 „
March . . .	„ 70 to 74 „	„ 64 to 67 „
April . . .	„ 72 to 76 „	„ 65 to 68 „
May . . .	„ 75 to 78 „	„ 66 to 70 „
June . . .	„ 75 to 78 „	„ 66 to 70 „

The above table is intended only as a guide to the temperatures necessary to produce ripe grapes by the end of May after closing the house for forcing on the 1st November. On the afternoon of sunny days, when the vinery is closed and

syringed, the temperature may be allowed to rise to 85 degs. with advantage, from the end of March to the end of May. After the grapes are disposed of in the course of the month of June, fire heat will be discontinued and air liberally admitted night and day, and the temperature afterwards will be governed more or less by the weather outside. For successional vines started later the principle of working is similar, *i.e.* close the vinery with sun heat only for the first fortnight, then give slight fire heat, and gradually increase the temperature as growth advances. For late autumn or winter grapes little fire heat is needed, excepting in late summer or autumn, to assist in ripening them and afterwards to prevent the atmosphere becoming cold and damp.

THE VINE ON WALLS OUTDOORS

By THOMAS COOMBER

The vine is not very commonly grown upon walls outdoors in the British Isles for the sake of its fruit ; nevertheless, there are many districts where if thus planted it will flourish and produce fruit fit both for dessert and making wholesome wine. The wall should have a south or west aspect, and be fully exposed to the sun, so that the wood or fruit can reap the full benefit of the sun's influence, which is essential to success. The soil must also be suitable to the vine's requirements. A fertile deep loam naturally well drained is best, and all the preparation such a soil wants to be made a satisfactory rooting medium is to be trenched and broken up 2 feet deep ; by incorporating a good supply of crushed bones, wood ashes, and lime, or old mortar rubble, most soils are rendered suitable for grape culture. Thorough draining is necessary.

Strong young canes may be planted early in October before the leaves fall, or in spring when their buds are bursting ; in either case they should be cut down while dormant to three buds from the base. Carefully remove the soil from about the roots, disentangling and regularly spreading them out not more than 6 and not less than 2 inches below the surface ; this should be made quite firm, and subsequently mulched with short litter. The vine succeeds best, and is most simply managed when placed upon moderately high walls, with its shoots trained 3 feet apart in a vertical position. It can be restricted to one rod or more as desired, and planted accordingly at 3 feet or more apart. With the single-rod system all growths but the strongest one should be removed ; train this in position, and stop it when 3 feet long, allowing its subsequent leading growth to extend indefinitely, and stopping the laterals beyond one leaf. The winter pruning merely consists in shortening the vine to within 3 feet of its base at the point where it was checked, and closely cutting away the lateral growths. The following season the leading young shoot should receive similar treatment, and the laterals arising beneath it be so disbudded that the strongest of them only are left ; arrange them about 16 inches apart on either side of the vine. They must be stopped so that they meet half-way those of the adjoining canes, and the sub-laterals be pinched at the first leaf. At the winter pruning

the leading growth should be treated as before, while the laterals upon the older part of the vine-stem are cut back to two prominent basal buds. This method of management gives sufficient space for the wood to become thoroughly ripened, and should be followed until the allotted space is filled, after which time the training and pruning will be wholly confined to the laterals. When vines have more than one branch or "rod," each should be treated as if it were a separate vine.

Vines may be lightly cropped the third season after being planted, but at no time should a lateral be permitted to carry more than one bunch, and the weight of the fruit that established vines may carry must be governed by their vigour and size; overcropping, however, always has an enfeebling effect, and impairs the quality of the fruit. There is no better stimulant than the drainage from cow sheds and stables, which can be applied in a diluted form during the growing season as well as in the autumn after the fruit is gathered. Top-dressings of light soil, bone meal, or similar rich fertilisers used in the autumn, are also of much value, while during seasons of drought, mulching the borders with short litter is beneficial. The most virulent enemies that the vine on walls outdoors is subject to, are red spider and mildew, but if the vines are kept adequately supplied with nourishment, moisture at their roots, and properly syringed with soft water in summer, attacks of red spider will be comparatively rare. An efficient remedy for mildew, which is very injurious if permitted to take its course, is the Bordeaux mixture; this should be applied in a fine spray. Flowers of sulphur, which should be distributed with a dredger, make a good remedy also. As a winter dressing after the vines have been pruned, and the loose bark removed, Gishurst's compound, used at the rate of 4 oz. to a gallon of hot soft water, and well rubbed into the crevices, so that the whole surface of the rods is thoroughly soaked, is a very effectual cleaner. Of varieties "Sweet Water" is excellent for general purposes. Black Cluster and Royal Muscadine are also useful. Reine Olga should be added; it is a novelty of great excellence, and recently obtained an award of merit from the Royal Horticultural Society. Its colour is tawny red, the bunches are large, while the flavour is rich. For ornamental uses *Vitis purpurea*, *Vitis Coignetia*, and the Parsley-Leaved Vine are invaluable.

VINE CULTURE IN THE OPEN

By ANDREW PETTIGREW

The subject of vine culture in the open would hardly have found a place in a work of this description a few years ago, when the only examples of vines outdoors in this country were those growing against cottage walls, and regarded more as decorative plants than fruit producers. The experiment of the late Marquess of Bute in planting vineyards on his estates in Glamorganshire, South Wales, with which the readers of gardening periodicals are now familiar, has quite proved the practicability of growing vines in the open as a more or less remunerative undertaking, and it is on this account that the subject finds a place in the present work.

After more than twenty years' experience I am of opinion that on suitable sites in the south of England and in South Wales, furnished with proper appliances for making the wine, and with every convenience to lessen labour, vine culture could, taking one season with another, be made a paying industry, and give employment to many. It is evident from the foregoing remarks that any one contemplating hardy vine culture with a view to making wine must invest a considerable sum of money in providing suitable plant, buildings for its manufacture, and cellar accommodation for storage before there are any returns. For these reasons, and the uncertainty of our climate, vine growing in the open is a more expensive and risky undertaking than any other phase of hardy fruit culture, and to be remunerative, must only be attempted in the southern counties of England and South Wales. So far as I know the only establishment where it is carried on as a business concern is in the Marquess of Bute's vineyards. To emphasise the fact that the experimental stage of hardy vine culture in this country has long since been past, it may be as well now to give a short history of the vineyards in question.

The first portion of the vineyard at Castell Coch, Glamorgan, was planted in the spring of 1875 on the French system, as practised in the neighbourhood of Paris, in Burgundy, and the champagne country, with the variety Gamay Noir, a hardy grape which is grown extensively in the colder wine-producing districts of France. This variety has a strong constitution, fruits freely, and in good seasons its fruit, which makes very good wine, ripens well. The ground was thoroughly trenched, and the vines planted in rows from north to south 3 feet apart, 3 feet apart in the rows, and trained to stakes 4 feet high, as raspberry plants are trained. As the canes grow they are securely tied to the stakes, and their points pinched off when they have reached to within a few inches of the top. All the lateral shoots, as soon as they appear, are stopped at the first joint; the stopping of sub-laterals is continued throughout the growing season, and the tendrils are pinched off from the time the vines begin to grow. This and hoeing, and keeping the ground clean, form the principal work in the vineyard during the summer months. But stopping the lateral shoots gives more work than all the other operations in the vineyard. In England the rainfall is much greater than it is in France, and the vines in consequence grow more strongly, and make more sub-lateral growth than they do in the French vineyards. Frenchmen visiting the vineyard at Castell Coch were struck with the healthy appearance of the vines, and the vigorous growth they made, which, they said, was stronger than that made in France.

The vines are pruned as soon as the leaves fall in the autumn, and the canes cut close down, leaving from two to three buds of the current year's growth. This hard pruning is to keep the stools of the vines dwarf and close to the ground, so that the grapes may get as much of the earth's radiated heat as possible. When the pruning is finished, and all the useless shoots cleared away, the stakes are thoroughly examined, and all bad and doubtful ones replaced. The surface of the ground between the rows is then slightly forked and top-dressed with short manure. Manuring is done once in three years according to circumstances, but the vineyard gets a slight dressing of soot every spring before

the vines start into growth. Nothing more is done to the vines until they break into growth the following spring, when they are disbudded as soon as the bunches are distinguished on the shoots, and from three to four shoots are left on a plant, after which the same process of tying, stopping, and keeping the ground clean, as described above, is carried out during the growing season.

From the time the first portion of the vineyard was planted, a piece was added to it every year until the allotted space was completed. Cuttings 1 foot long were made from the strongest and best of the prunings, and planted in nursery rows as is done with gooseberry cuttings. In two years they made good canes, and were planted out in their permanent quarters in the vineyard the following spring. The first wine was made in 1877, and more or less has been made every year since with two or three exceptions when the seasons were bad.

The vintage of 1881 was of excellent quality, and the whole of it was sold (except a few dozens) at 60s. per dozen to a wine merchant at Cardiff. Dr. Lawson Tait, late of Birmingham, a noted connoisseur in wines, bought several dozens of it from the wine merchant in question, some of which was sold by auction at Birmingham the following year, and realised 115s. per dozen.

The late Lord Bute was so pleased with the results of the experiment at Castell Coch, that I was instructed by him in 1886 to make further experiments with the cultivation of the vine in different parts of his Welsh estates where it was thought there was a probability of its succeeding. A site was selected at Swanbridge, about seven miles from Cardiff, close to the shore of the Bristol Channel, as a most likely place for a vineyard. Both the soil and situation have been found suitable. The vines grow well, and have produced excellent crops of grapes almost every year since they were planted. The site is open and less subject to mildew than Castell Coch, which is sheltered from the north by a high wood. The vineyard, when planting is finished, will contain about nine acres of vines. Three parts of it have been planted, and about three acres of the vines are in full bearing. In good seasons as many as forty hogsheads of wine have been made, and for some years past the yield has not been less than twenty-five to thirty hogsheads.

CHAPTER XX

FRUIT TREES AS FLOWERING TREES

By HUGH A. PETTIGREW

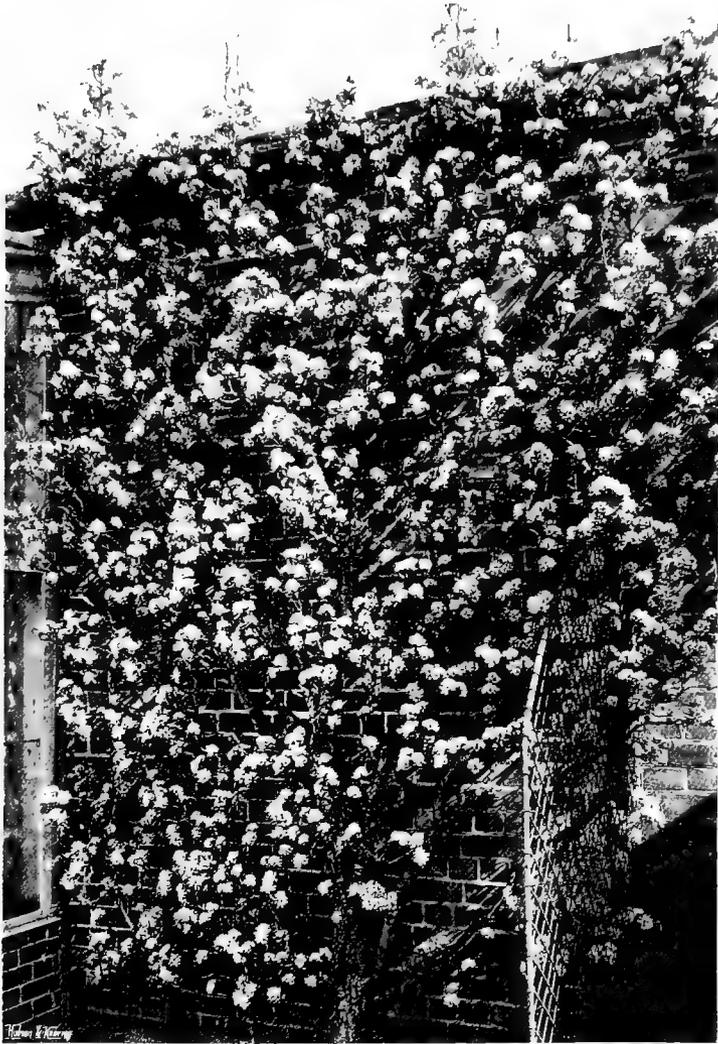
THE importance of apple, pear, plum, and cherry trees as fruit producers has tended to obscure the fact that they are invaluable in the somewhat minor character of ornamental flowering trees and shrubs. The very utility of these trees has, so to speak, almost blinded us to their floral value, and so much so, that their use in the pleasure ground, shrubbery, or any other position than the fruit garden, would be regarded as a doubtful proceeding. Where the end in view is the production of the best fruit then the fruit garden is certainly the place for these trees, but where floral beauty and picturesque effect are the primary considerations, as in large shrubberies, fruit trees may and ought to be used.

All our hardy fruit trees, with the exception of the currants (*Ribes*), belonging as they do to the rose family, produce an abundance of beautiful flowers, and what still more enhances their value, they come into blossom at a period of the year when shrubberies are dressed in their most sombre apparel, and the ordinary border is almost bare. In the early days of spring it is impossible to pass through the orchard or fruit garden without being greatly impressed with the beauty and charm of the surrounding fruit trees in flower, even when the mind is distracted by hopes and fears as to the successful consummation of the display in a crop of fruit. If the beauty of fruit trees appeals to one so much when seen in the formal fruit garden, where few, if any, contrasts exist, and where the trees are planted in regular lines at set distances apart, how much more intensely would it do so if the fruit trees were among other trees and shrubs—amidst the many contrasts of form and colour to be seen in the most ordinary shrubbery.

It is difficult to imagine a prettier spring picture than is provided by groups of pyramidal fruit trees growing in a large shrubbery, with a foreground of the dwarfer evergreens, and a background of dark-green conifers, with here and there clumps of the sloe.

All kinds of hardy fruit trees are suitable for shrubbery planting, and when once used in this way and their value realised, one wonders why they are not more commonly seen outside the fruit garden. For many years past we have seen pear, cherry, plum, almond, medlar, and apple trees used in the shrubbery, and with the best results.

Having decided to plant fruit trees for their ornamental value, the question naturally arises as to which are the best kinds and varieties to grow. In making



OLD WALL PEAR TREE IN BLOSSOM.



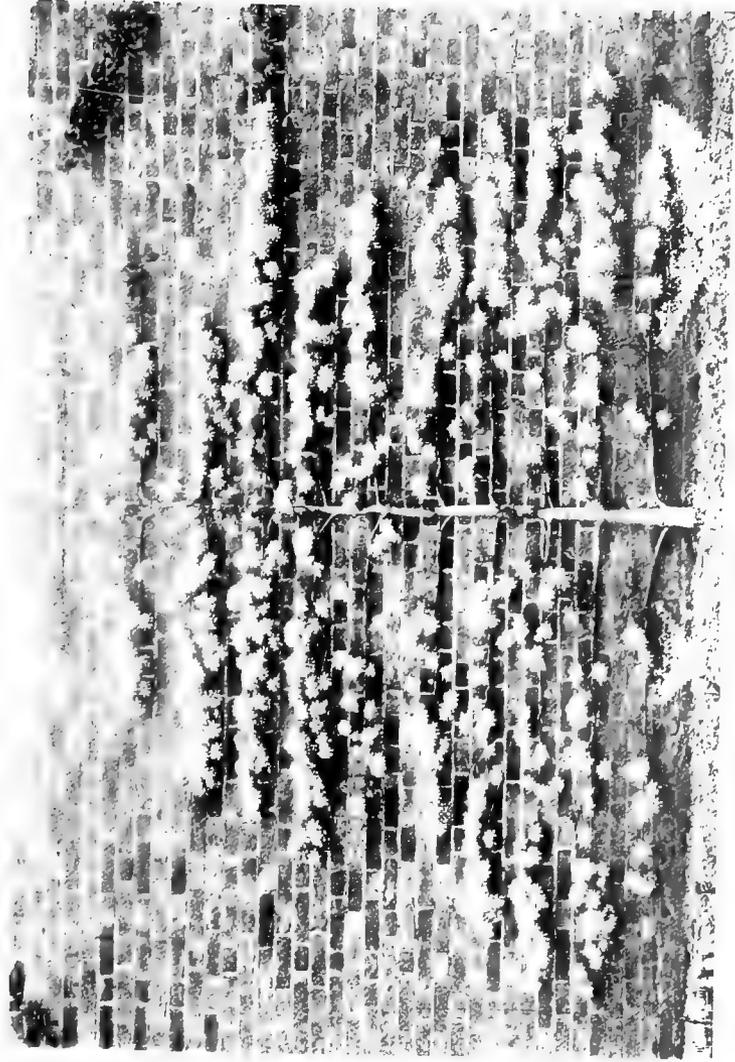
*THE WISE APPLE TREE (COURT PENDU PLAT) IN
FLOWER AT FROGMORE.*

a selection, several things have to be considered. First of all, if a prolonged display of blossom is desired, and there is sufficient space at disposal, a selection of varieties might be made from each of the genera previously mentioned, remembering that as a general rule flowering takes place in the following order : almond, peach, plum, cherry, pear, apple, and medlar. Then, again, it may happen that although the primary object of growing fruit trees in the shrubbery and pleasure grounds is for picturesque effect, yet the owner has hopes that the blossom will be succeeded by a harvest of fruit. In such cases varieties should be chosen which produce useful and at the same time showy fruits. Consequently, in planting apple trees, we would choose those sorts that are free-bearing, and whose fruits are of the brightest colours. Irish Peach, Worcester Pearmain, Cox's Orange Pippin, King of the Pippins, Ribston Pippin, Astrachan, are all free-flowering varieties, having beautifully coloured first quality fruits. Lord Suffield, Ecklinville Seedling, Warner's King, and Keswick Codlin, although producing poorly coloured fruits, nevertheless are invaluable for this work on account of their profuseness of flowering and large individual blossoms. The various Crabs ought also to find a place among such a collection as we are considering, for few fruits make a more brilliant display in the autumn months.

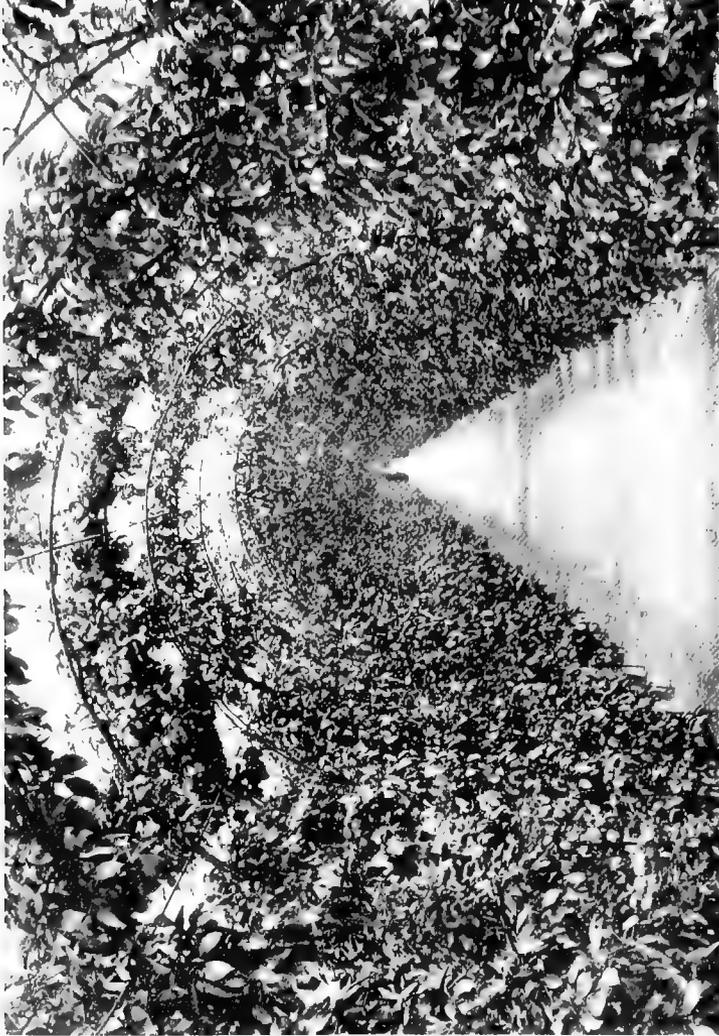
In the choice of pears the colour of the fruits is not important, so that floriferousness and quality of fruit remain the chief considerations. Marie Louise, Louise Bonne of Jersey, Duchesse d'Angoulême, Pitmaston Duchess, and Jargonelle are all free-flowering hardy varieties producing useful fruits, and on the whole could hardly be improved upon for shrubbery planting. Cherries cannot be cultivated in the flower garden for any other object than their blossoms, as the pulpy fruits tempt all the birds in the neighbourhood, even before they are ready for gathering, and netting the trees would so detract from their appearance as to destroy the effect for which they were planted. We have seen Morello cherries produced in shrubberies, and a fair percentage of the crop saved from birds, but the fruit of sweet cherries never, so that with this one exception cherries must be used outside the fruit garden as flowering shrubs only. On the other hand, plum and damson trees are quite as likely to ripen their luscious fruits while occupying a position among other shrubs, as when growing in the fruit garden proper. Fruit trees in the shrubbery or on the lawn may either be grown as standards or pyramids just as occasion and environment require. In the case of the apple and pear the choice of stocks for the different varieties determines whether they can be used as small trees or large shrubs. When planted in the back ground of a large plantation, singly, or in groups on the lawn, it is advisable, whether grown in the form of a standard or otherwise, to have them grafted on the Free stock. If in a small shrubbery or border of limited width, we would advocate the use of the Paradise stock in the case of the apple, and the Quince stock for the pear, so as to insure plants of dwarf, bushy habit of growth.

As an artistic feature in the pleasure grounds an orchard planted solely for the beauty of its flowers and fruits has much to commend it. Its charm in

the spring could be enhanced by naturalising, in the grass beneath the trees, such bulbs as snowdrop, crocus, scilla, narcissus, tulip, and camassia, and in addition climbing plants as wistaria, clematis, jasmine, honeysuckle, roses, and *Polygonum baldschuanicum* in time might be grown over some of the vigorous varieties of apple and pear trees. In this case only standard fruit trees should be planted. Although pruning the various trees mentioned need not be so severely carried out where these are cultivated for their beauty as when grown solely for fruit, yet as the object in both instances is the production of flowers, whatever means are adopted to bring this about in the one case ought to be useful in the other ; judicious pruning is quite as requisite in the flower garden as elsewhere. Much more might easily be said regarding the ornamental value of hardy fruit trees, but sufficient has been written to indicate the great wealth of material at our disposal for garden decoration, and to show that fruit trees are no less beautiful than useful.



HORIZONTALLY-TRAINED PEAR TREE IN FLOWER.



A PEAR TREE WALK IN THE GARDENS AT SWALLOWFIELD PARK.

CHAPTER XXI

PLANTING FRUIT TREES

By GEORGE BUNYARD

SEASON.—Bush fruit trees, currants, gooseberries, &c., may be planted towards the end of October and onwards until April. It is best to plant plum trees early in November; apple and pear trees about mid-November. If the latter are transplanted earlier the shoots are liable to shrivel. The planting of all fruit trees can be performed whenever the land is in good condition, from November until April. Generally speaking, it is best done before Christmas, although experience proves that late planted trees will thrive well if the work is carefully and thoroughly carried out. Trees planted later than January should not be pruned until after the first summer's growth.

HOW TO PLANT.—If a small hole is made for a large mass of roots, if the roots are crammed into the hole without care, or if they are shortened so as to be made to fit into a hole of a certain size, failure is almost certain to result. The following are the most important points to observe in planting fruit trees: (a) the position having been chosen, a hole should be made 3 feet wide and $1\frac{1}{2}$ feet deep; these dimensions usually will be sufficient. Break up the soil at the base of the hole. (b) If the roots of the tree are spreading they should be shortened back as much as is necessary by cutting them with a sharp knife from below; any which are growing directly downwards should be shortened to 6 inches: these are commonly called tap-roots. They are apt to encourage gross growth to the detriment of fertility. A sufficient number of "anchor" roots must be left to keep the tree firm. (c) Place the tree in the hole, and if the soil mark upon the stem—showing how deep the tree was planted before—is below the surface, throw in sufficient soil to raise this soil mark 3 inches above the level of the ground. Then cover the roots with fine soil, spreading out the lowest ones; lift the upper fibrous roots and add more soil beneath so as to raise them near the surface. Shake the tree stem to make the soil fill all the interstices, then fill the hole to within 3 inches of the ground surface. (d) Make this soil very firm by treading, taking care not to bruise the roots. If the tree is a standard, it may then be staked. (e) Completely fill the remaining space with soil, and tread it down lightly. As before mentioned, take care that the earth mark upon the stem is 2 or 3 inches above the ground surface; it is certain to sink to some extent. It is always best to plant so that the fibrous roots are near the surface. Deep planting, especially in damp and clay soils, is fatal; the hole is then nothing better than a water trap. (f) Complete the staking, placing straw between the tree and the stake, where they are tied

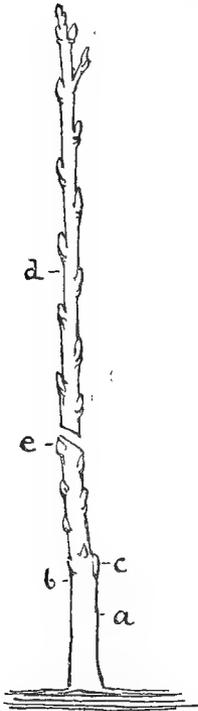
together. Protect the stem from rabbits, if necessary, with 1-inch mesh galvanised wire-netting, or by means of thorny branches placed around.

SOIL.—As a rule, ordinary garden soil is rich enough for all fruit trees, but in orchards, or grass land, or in poor soils, they must be fed with manures. An excellent plan is to place half-rotted manure on the ground surface, above the roots, after planting. When manure is mixed with the soil in the hole, it decays, and is liable to do harm to the roots; it also causes the soil to become friable and loose, and the roots of all fruit trees like a firm soil.

DEFERRED PLANTING.—During the planting season it often happens that frosts are experienced, and the work has to be deferred. The trees should be laid in the ground, the roots being well covered with soil, until planting can be resumed. The trees should never be laid in thickly, for instances have occurred where field mice and rats have nibbled off the bark.

WALL TREES.—Where wall trees are planted, the soil may have become exhausted or very dry by the demands made upon it by previous trees. In such cases well-rotted manure and good loam should be used to plant in. If the soil is very dry water the trees well when planted.

TREES ON GRASS LAND.—The turf removed when holes were made for fruit trees should be chopped up and used for planting. Keep the surface soil loose, friable, and free from weeds for the first four years, otherwise the land may crack. Weeds rob the soil of nourishment, hinder the progress of the surface roots, and prevent the tree making a good start. The method of planting strawberries, raspberries, and currants is treated of in the chapters devoted to these fruits.



A MAIDEN, OR ONE-YEAR-OLD APPLE TREE

(a) Stock; (b) point of inserting bud; (c) point of cutting off snag of stock; (d) shoot from bud; (e) point of cutting back, about 1 foot from ground, or at the height desired, but always to good buds on well-matured wood.

PRUNING NEWLY PLANTED TREES

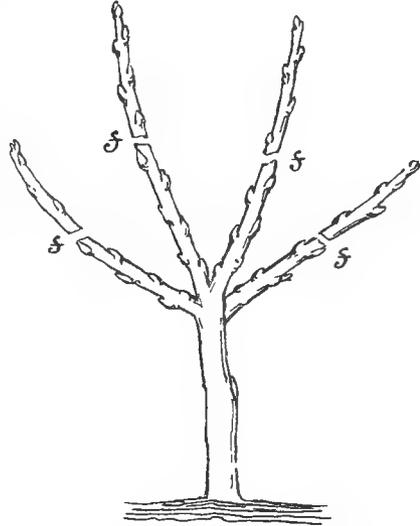
Experts differ as to the advisability of pruning the first or the second year after planting. Roughly speaking, trees that are carefully planted before Christmas may be pruned in the month of February in gardens, but orchard trees should be allowed a summer's growth before they are cut back. Thousands of trees are ruined by over-pruning the first year; they form weakly growth and fruit-spurs, instead of that vigorous growth which lays the foundation of a finely developed tree. Supposing the orchard trees have had a summer's growth, the pruner first cuts out all misplaced shoots and shortens the rest back to within 9 inches of the old growth or the stem, taking care that the end (or terminal) buds point outwards. After this from 9 to 12 inches of new growth is left annually; the desired basin-shaped

tree is secured by cutting back the inner branches to four buds, and regulating the shoots so that a proper balance is kept upon all sides of the tree. Cherries require this treatment for three years, other fruit trees for longer; but when the heads are well developed only weakly shoots or those which cross each other, and useless spray, will require to be cut out. Trees carefully pruned give the finest fruits, so that year by year a little attention pays. With garden trees, as pyramids, espaliers, bushes, it is only necessary annually to cut back the side-shoots to four buds, and to leave 6 inches of new growth upon the leading shoots. Of course, close pruning is necessary for a few years until the desired form is secured.

The side shoots of cordon pear trees must not be cut in too closely, four to six buds should be left; some of them may go blind. Shoots of cordon apples may be cut in closer; those near the top of the tree ought to be shortened more than those at the base, otherwise the basal fruit-spurs may suffer.

BUSH FRUIT TREES.—Cut back the shoots of red and white currants and gooseberries to within six buds of their bases after planting, afterwards 6 inches of new growth may annually be left until the bushes are formed. Black currants require different treatment, see the chapter dealing with this fruit.

SUBSEQUENT TREATMENT.—A common error in fruit culture is giving an excess of manure to young trees. Moderate, well-ripened shoots are best; where growth is forced as it were, sappy wood is produced, and young trees, especially of the cherry and plum, are liable to be injured by frost. Where new growths more than 12 inches long are made in one season, the trees do not require manuring. It is wise to assist only those trees bearing heavy crops; liquid manure and soapy water will then help both trees and fruits. The pruning of wall fruit trees is described in the chapters dealing with their culture.



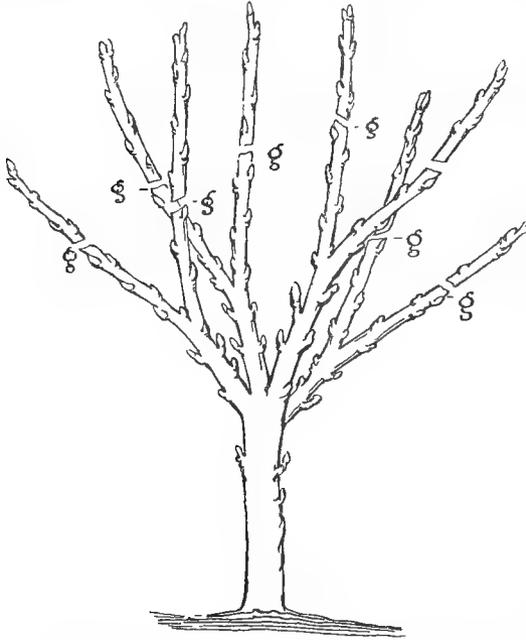
TREE IN SECOND WINTER, FOUR OF THE STRONGEST AND BEST SITUATED SHOOTS HAVING BEEN SELECTED IN THE PREVIOUS SUMMER, THE OTHERS REMOVED. THOSE RETAINED ARE ALLOWED TO EXTEND, AND ANY SIDE SHOOTS THAT ENSUE ARE PINCHED AT THE SECOND OR THIRD LEAF.

(f) Shoots cut to outside buds, 6 inches from their bases.

ROOT-LIFTING AND ROOT-PRUNING

Ordinary garden soil having been heavily manured for the culture of vegetables is usually so much richer than the soil of a nursery that apples and pears, after having given perhaps two satisfactory crops, begin to grow very rapidly.

Severe cutting and pruning only makes them grow the more wildly, and they often become unfruitful. The time has then arrived to lift these gross young trees, to cut off all the roots going straight down, and to shorten the horizontal ones. If this is done at the end of October before the leaves fall, the trees do not suffer in the following spring. Some are too large for removal altogether, and the work must be done gradually. To lift a tree,



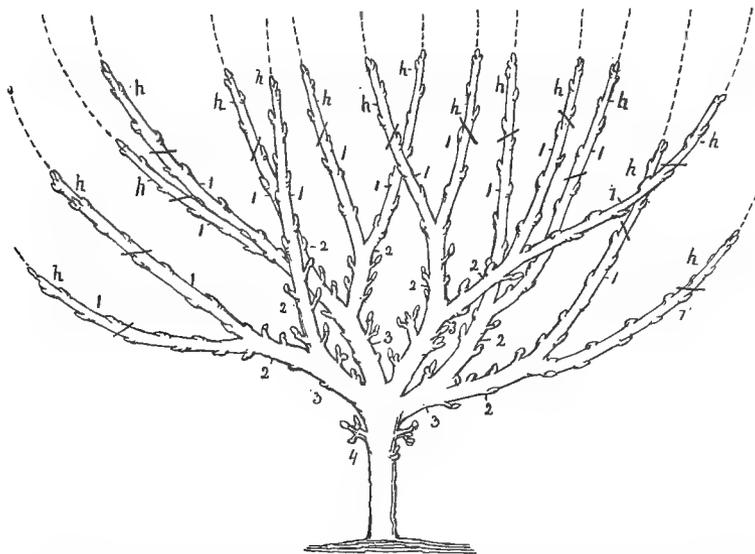
TREE IN THIRD WINTER, TWO SHOOTS HAVING BEEN ALLOWED TO EXTEND FROM THE UPPER BUDS OF EACH BRANCH, ALL OTHERS EXCEPT SPURS BEING PINCHED TO FOUR GOOD LEAVES.

(g) Points of shortening the eight main branches to within 6 or 8 inches of base of summer growth; all side shoots are cut back to two buds.

first open a trench on one side of it 4 feet from the stem, then work underneath until the tap-roots (*i.e.* the thick, gross roots) are reached; remove these and shorten any other gross roots that may be found. Should there be a fair quantity of fibrous roots, the other side of the tree should next be treated, but if few fibrous roots are found it is best to leave the completion of the work until the following October. In refilling the trench, the finer soil must be placed about the roots, and they should be brought towards the surface as much as possible. It is better to fill up the trench with some good loamy soil without manure, making this firm. We prefer to mulch the surface (which is done to retain moisture and to encourage new roots) in March instead of immediately after planting, for the mulch prevents the sun from warming the soil and obstructs the rains. All fruit trees must be firmly planted.

These remarks refer to espaliers, pyramid, and bush trees of apples and pears. It is not advisable to root-prune standard trees, for they would on losing their main roots be liable to be blown down; if the heads of the trees are kept moderately thin, fruit-spurs will soon form and bear naturally. Cordon trees require frequent attention to root-pruning; they are often highly manured, and being also mulched when fruiting they are liable to grow too freely. Cordon pears on the Quince and cordon apples on the Paradise stock are fibrous rooted, and they do not suffer if root-pruning is performed at the end of October or the beginning of November as soon as the fruit is gathered.

We have successfully renovated large trees that had been planted ten years. Coarse roots should be cut with a sharp knife, and from beneath; the severed portion should be removed, or it may rot. The object of lifting and root-pruning is to secure a proper balance between roots and top growth; the lower or tap-roots promote gross growth, the surface or fibrous ones nourish the fruit-spurs, and it is the latter, of course, that should be encouraged. Failure must



TREE IN FOURTH WINTER, TWO SHOOTS BEING TAKEN FROM EACH OF THE EIGHT BRANCHES IN THE PREVIOUS SUMMER. THE TREATMENT IS A REPETITION OF THAT OF THE PRECEDING SEASON, THE TREE NOW HAVING SIXTEEN BRANCHES, FROM 9 TO 12 INCHES APART, AND AS NEARLY AS POSSIBLE OF EQUAL VIGOUR; THE FRAMEWORK OF THE TREE IS THUS SECURED.

(h) Leading shoots; if not more than 15 inches in length, they are left entire, but if longer, they are cut back about the height named, indicated by cross lines, and in the following season one of the best growths from each cut back leading branch is selected as leader, and taken forward as shown by dotted lines; the rest must be pinched; 1, 2, 3, and 4 indicate age of wood in years.

attend root-pruning when done later in the season, as new roots do not then so readily form. If the weather is dry in May and June a copious watering should be given to trees which have been lifted.

CORDON AND PYRAMID CHERRIES must be very carefully root-pruned. The Morello and Duke varieties naturally form very fruitful trees, and do not need attention so much as the Bigarreau or Heart cherries. The latter should be root-pruned every other season until luxuriant growth is checked; they grow very freely, and the hard cutting necessary to form the desired shape may, and often does, cause them to gum and lose boughs; but after two or three root-prunings

the trees become thickly set with fruit spurs, and then as they bear more fruit will not grow so freely. As far as possible the strong shoots should be stopped in August, and the smaller ones pinched earlier, when the wood is green, leaving only such terminal shoots as are required to form the tree. On walls cherries do not need root-pruning so much.



PINCHING LEADING GROWTH

- (i) Point of stopping when rather more than a foot long; this causes the basal buds to swell, and one or more shoots to push from the upper buds; uppermost growth is pinched to three full-sized leaves; laterals pinched to one leaf.

PLUMS, PEACHES, AND NECTARINES.—As these form mat-like roots, they can be safely root-pruned, even when of large size; it is not advisable to feed young trees much, or they will make wild growth which robs the fruiting branches, and if not checked will eventually ruin them. Plums especially often grow too fast for a few years, they make more fruitful trees when root-pruned the third year after planting and again in five or six years if the wood growth is excessive and prevents the formation of fruit buds. Peaches and nectarines benefit greatly by root-pruning, and the coarse roots may well be shortened whether the trees are on walls or grown under glass. Should a cold, drying wind prevail after root-pruning has been done, a syringing overhead will be beneficial for ten days or so. Peaches and nectarines may be pruned at the roots even when the foliage is on, if shaded, syringed, and well watered.

FIGS ON WALLS.—These, even when old, require severe root-pruning to make them fruit satisfactorily; on filling the trench, porous stones, brick ends, with old mortar rubbish should be freely used, and even lime and chalk, as the fig luxuriates in calcareous soil. Summer mulching and liquid manure greatly benefit the fruits.

GENERAL REMARKS.—Root-pruning is often rendered necessary, because of too heavy manuring or too deep a soil, whereby the best roots are destroyed or become gross feeders. The advantages of root-pruning and root-lifting are briefly as follow:—

(a) This work induces fertility, (b) cures canker (which is often caused by the roots being too deeply covered), (c) improves the flavour of the fruit, (d) prevents the formation of useless roots and shoots, (e) reduces the labour of summer and winter pruning.

CHAPTER XXII

HOW TO ERECT A FRUIT-HOUSE

By GEORGE BUNYARD

THE FOUNDATION.—First level the soil and dig out holes for the corners large enough to admit brick piers 14 inches by 14 inches or stones about 12 inches square; fix an iron dowel in the centre to receive the corner posts of the structure. Some provision for air should be made just above the ground line; air bricks may be let in the wall, or an aperture made and covered outside and inside with perforated zinc. If the house is more than 20 feet long, an extra foundation to hold another support should be put in half-way between the ends.

THE MAIN POSTS.—These should be 6 feet long and 6 inches square. Prepare a hole in the foot to receive the dowel mentioned above; this will keep the framework firm. The main ground plate should be $4\frac{1}{2}$ by 3 inches, and the top plate of the same size. Support and make firm in the usual way with quartering $4\frac{1}{2}$ by 3 inches, and when this is fixed choose a dry day and pitch, tar, or cold creosote the lower plates and all the woodwork 2 feet from the ground, to protect from damp. The quartering should have an even exterior to which to secure the matchboard.

OUTSIDE COVERING.—The cheapest material for this is $\frac{3}{4}$ -inch matchboard, and it may be fixed outside the roof rafters as well. Inside "bonds" from one side of the house to the other are $4\frac{1}{2}$ by 3 inches. If stout, they are useful to hold planks upon which baskets can be placed overhead in the roof space. In order to receive the side thatch, a board 6 inches wide is attached round the door-plates at right angles and at the corners from the ground to the eaves; in it the thatch is placed upright, and is kept in position by lateral pieces of wood 3 inches by 1 inch.

THE THATCH may be 18 inches thick on the roof and 6 inches at the ends and sides. Sedge or reed is strongest and lasts longest, but wheat straw or heather may be used as thatch.

DOORS.—These must be provided both inside and outside; they should be made to fit closely so as to exclude draughts.

WINDOWS.—In order that the fruit may be readily inspected, windows of 21-oz. glass are inserted. This saves the use of a candle at storing time, but outside shutters must be provided to keep the room dark at other times.

VENTILATION is provided by means of an opening, 18 by 18 inches, under the apex of each end of the roof, a small opening also being left between the shutters, which can be filled with hay or moss in severe weather. These openings should be protected by perforated zinc fine enough to keep out wasps and

flies. Other ventilators must be placed, inside and outside, about the middle of each side of the structure, under the lowest shelf; the aperture inside is covered with perforated zinc, while outside there is a shutter.

PROTECTION.—To protect the contents a $\frac{1}{2}$ -inch mesh stout wire-netting should be fastened to the matchboard outside, beneath the thatch, so that an entry would be difficult. This is advisable also to keep out rats.

INSIDE SHELVES upon which to lay the fruits are readily fixed at the sides. First place uprights, 2 by $1\frac{1}{2}$ inches, from the ground to the rafters, and then attach bearers, 2 inches by $\frac{3}{4}$ inch, from these to the quartering. One foot between the shelves is a very convenient distance; the lowest shelf being placed 6 inches from the ground makes six in all. The shelves are made of $\frac{3}{4}$ -inch matchboard; they should be about $\frac{1}{4}$ -inch apart, so as to allow a slight circulation of air. Upon the shelves place clean wheat straw, so that the fruit shall not touch the wooden shelves. In the centre of the fruit-house a narrow table with a raised edge is useful for displaying exhibition collections or special fruits. Baskets of fruit for early use can be placed underneath it.

FLOOR.—The best possible floor is the natural earth; paved surfaces are apt to become too dry. The latest varieties of fruits should be stored on the lowest shelves.

NAMES.—Provide slips of zinc 4 inches long, turn up one end an inch at an angle of 45 degs.; slit this three times, bending the central "tongue" so that a neat card may be held firmly. The other end of the zinc label is pushed under the straw.

It is not necessary to erect this fruit-house in the shade.

GATHERING HARD FRUITS

APPLES.—The early ripening Codlins and summer dessert apples are always best when used fresh from the trees. The dessert sorts lose their brisk flavour and are apt to become mealy when stored. It may, however, be necessary to store them in order to make the most of the supply. Codlins will keep in a properly constructed store or fruit-room for three months in a firm condition if very carefully gathered and stored without being bruised. For gathering the basket should be lined with sacking, although for gathering on a moderate scale we prefer to use an open wood basket. This, when lined with fine straw or wood-wool packing, is taken to the trees, the fruit being regularly laid in rows as gathered. If the fruit is soft there should only be one layer. When two of these baskets are full they can be carried to the fruit-room on yokes; thus all jolting is avoided. The baskets are invaluable for gathering choice fruit or for use among dwarf trees or espaliers. Where ladders are used an ordinary peck gathering basket with a hook to attach it to the ladder or tree is large enough. The basket should be lined with soft material, and when full the contents are transferred to a larger receptacle. The wholesale removal of the fruit from one basket to another means bruising, and except for common sorts should be avoided. When to gather the fruit is a difficult question to answer. Growers should not be alarmed if a few fruits fall,

for very often they are maggoty. If sound, and when cut open the pips (seeds) are of a dark colour, the fruits are ready for gathering. Our experience, however, is that more apples are spoilt by being gathered too early than the reverse. Fruit fully matured keeps sound longer and is in every way better than fruit not quite ripe, and a few fruits lost at gathering are unimportant if one obtains the bulk of the crop at the proper time. When storing the finest examples may be placed in single layers, and the remainder should be carefully laid on the shelves not more than two layers thick (one preferably), except the late and smaller-sized dessert sorts, which can be heaped up to 1½ feet deep without harm.

Any bird-pecked, maggoty, or bruised fruits should not be stored with the sound ones.

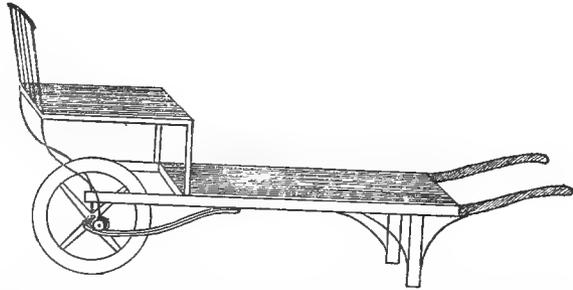
LATE APPLES.—These require more care in storing, as a bruised fruit will decay and affect all those that come into contact with it. It is not every fruit-room that will admit of the entire crop being laid out in one or two layers, therefore the later fruits may have to be heaped, but if carefully

handled they keep well in this way on the floor. The drier sorts can be laid more thickly than the juicy ones. They must not be left in the baskets, as the uneven sides of the latter bruise the outside fruits. We do not find any covering necessary, but care must be taken to keep out severe frosts, either by extra inside or outside covering; especially is this essential when wind and cold come together. We find a lamp to give sufficient heat.

GATHERING PEARS.—Pears are very tender, and much care is required in gathering and in storing. Never should more than one layer be permitted in the fruit-room; then every fruit can be seen at a glance, and any commencing to decay can be at once removed. More than ordinary care must be exercised to avoid storing any bird-pecked or unsound fruit, for pears should not be moved when once placed in the fruit-room.

EARLY PEARS.—It is found that these are better flavoured when gathered a week before they appear to be ripe; the tree should be cleared at intervals. So treated they are less liable to become mealy and decay in the centre. The mid-season varieties can be tested (*a*) by slightly raising the fruit, when, if fit to gather, the stalk parts readily from the spur; (*b*) by examining the seeds as with the apple; (*c*) by observing when the stalk end grows over the spur it is attached to; (*d*) by a change of colour from green to orange.

LATE PEARS.—These require to be carefully managed. The trees must be



A SPRING BARROW, MOST USEFUL FOR TRANSFERRING BASKETS OF HARD FRUIT FROM THE TREES TO THE FRUIT ROOM

Length of shaft, 6 ft. 6 in.; diameter of wheel, 1 ft. 8 in.; width of barrow, 2 ft.

well mulched and watered to secure full size and flavour, and the fruit must be left on the trees almost into November (according to the season).

STEWING PEARS.—These can be stored in baskets or boxes, as they do not bruise so readily as the dessert varieties. In no case should potatoes, onions, roots, or bulbs be placed in the same store with fruit, nor should hay or other materials that may taint the fruit be used. Clean wheat straw may be thinly laid on the shelves where the fruits are to be placed.

CHAPTER XXIII

FRUIT STORAGE

By OWEN THOMAS

THE subject of retarding, storing, and preserving fruit is one of great importance to fruit growers. It may be well, however, to caution the inexperienced by saying that, however effective any structure may be in preserving fruit beyond its natural season, retardation, if practised for too long, will result in deterioration in weight, quality, and appearance. For instance, it is quite possible to keep an October apple under favourable conditions until the following March, but undoubtedly at a sacrifice of its qualities. Moreover, we have such an abundance of varieties naturally in season in March that it is useless to preserve October fruits until then. But the October fruit could be profitably retarded until Christmas, the Christmas apple to March, and the March variety to May and June. It is only against the abuse of the principle that I have a word to say. Late apples and grapes may with advantage be kept two or three months. The softer fruits, such as peaches, melons, pineapples, strawberries, &c., may be retarded with little or no deterioration in quality for a week or ten days even in the warmest weather.

In considering the question of providing the best means of harvesting and retarding fruit the fact should never be lost sight of that lessened evaporation is the object. This can only be brought about by having a temperature considerably below that of the atmosphere out-of-doors during warm weather, and by avoiding sudden variations of temperature in the fruit-room or the too free admittance of air.

It is only the large fruit-grower who requires a specially built fruit-room, yet there are thousands of smaller growers who will be glad to know how to retard their fruits, especially apples. If such have a cellar attached to their house it is the best place for the purpose. A layer of straw should be placed on the floor for the fruits to rest upon, and they should be looked over occasionally and the bad ones picked out. In frosty weather cover them with a light layer of straw, mats, or any available suitable material. In the absence of a cellar apples may be camped out in the garden, as is frequently done with potatoes, placing straw to rest them upon and covering them with the same material for about three weeks until they have finished "sweating." The bruised and bad ones then will also be distinguishable and can be picked out. The remaining sound ones are again camped in straw and covered over with 6 inches of soil, leaving wisps of straw for slight ventilation, 12 feet apart in the apex of the ridge. Camped in this way apples may be preserved in sound

condition for months. This manner of keeping the apple refers to mid-season and late varieties only. It serves no useful purpose to try and keep early varieties long. With reference to the choicer varieties of apples, such as Cox's Orange Pippin, Ribston Pippin, and others, the best way of preserving them is to wrap them in paper and place them in a cellar. Stored in this way I have known Blenheim Orange keep in good condition until June.

The retarding fruit-room proper may be built several ways. I had the privilege of building one at the Royal Gardens, Frogmore, underneath the floor of an existing fruit-room. Ventilation was provided by a shaft at each end, easily regulated, and by double doors, one of open trellis work for the admission of additional air when desired, and an ordinary lock door. In the warmest weather the temperature in this room was from 8 to 10 degs. cooler than the ordinary fruit-room above, and I found it invaluable for retarding fruit. A fruit-room of this description may be built underground with an arched roof and covered over with 2 or 3 feet of soil in which shrubs can be planted or grass sown. This is a useful method of making a cool fruit-room without its being an eyesore in a garden where space is limited. It should be high enough for a man to be able to stand upright, and the length and width in proportion to the quantity of fruit to be stored. It must have a sunk doorway at one end and a window at the other opening to an air cavity outside.

By GEORGE BUNYARD

I cannot too strongly impress upon all those who wish to keep their fruits firm and fresh for a long time that it is most important for them to be ripe when gathered. They must also be carefully handled, and finally laid singly upon the shelves without bruising. Fruits should never be wet when stored. Small apples keep better when three or four layers thick. Examine the fruits from time to time, and remove any that are decayed or decaying. *Keep the floor of the fruit-room damp continually.* Capital storage is ready to hand in the many oast houses which exist in Kent and Sussex, as the hops are generally gone and the oast cleared out before the apples for late keeping are gathered. There is no doubt that these substantial buildings are suitable both on the ground floors and the first floors, but the fruits keep best on the former.

The usual plan is for women to sort the fruit as it is brought in, and to lay it out carefully on clean straw in heaps of one sort up to 3 feet deep. After these heaps have sweated they are slightly covered to keep off dust, &c., then as frost becomes probable they are covered one foot deep with fresh, clean straw. In these heaps the fruit keeps sound and plump, and they remain there until January or March according to the market price. The varieties now most in favour for late sale are Wellington, Blenheim Orange, Winter Queening, Northern Greening, Deux Ans, Norfolk Beaufin, Cox's Orange Pippin, Golden Knob, and Wyken Pippin, and locally Hanwell Sowing, Grange's Pearmain, and Court Pendu Plat. But in a few years there will be a large supply of Tower of Glamis, Newton Wonder, Bismarck, Hambling's Seedling, Royal Jubilee, Lane's Prince Albert, and Bramley's Seedling. Year by year

the home-grown supply gets larger, and it may be possible to keep up a regular supply when a system of storage is generally adopted. It is in this direction that English apples for the English public may be provided. One of the largest fruit crops was that of 1900, and yet it is a fact that better prices were then obtained for late apples than in previous years.

The following valuable information on the storage of fruit is given in *The Garden* by Mr. William Crump: "I am of opinion that the thorough ripening and a proper means of storing hardy fruits do not generally receive half the care and attention they deserve, especially by those who require a long successional supply of firm, well-conditioned home-grown fruit. In our modern fruit-rooms utility is frequently sacrificed for structural effect. We were victims of this policy, and owing to the dry, arid atmosphere of our fruit-room we found it impossible to keep apples firm after March. Nothing that we could devise would prevent shrivelling. However, we commenced experiments with a view to improving matters. First we tried placing the fruit in barrels as gathered from the trees, on the American plan. This preserved the firmness of the fruits, but through their being packed in bulk the flavour was much impaired; the fruits seemed to lose their juiciness and briskness of flavour.

"Our next experiment was in an ordinary cellar, and here we found that the fruit kept firm and sound several months after being gathered. In fact, we were so convinced of the advantages of a cellar that we decided to adopt the Irishman's method of 'raising the roof by lowering the floor.' We consulted a builder, and he undertook to enlarge the interior of the room so as to form an additional 7 feet for shelves, underpinning the walls to form the cellar. Iron girders were placed across, and the original flooring was replaced thereon. An opening shutter was put in the floor of the interior at the one end, and another door through the outer wall at the other end, giving access both from the exterior and interior, and affording ample ventilation that is so necessary when the fruits 'sweat' shortly after gathering. A current of air is thus allowed to pass through the underground stores of fruit until the skins have lost their surface moisture, then, taking advantage of a cold morning, we shut up the cellar with the coldest air, only ventilating again when we can exchange for a fresh supply of cold air. The more moisture on the floor the better. The important point is to dry well the surface of the fruit before closing the room finally. The fruits may be placed in two or three layers, or singly. The best temperature we consider to be 40 to 45 degs. Fahrenheit. Cool storage with co-operative fruit-growing would revolutionise our home productions in a commercial sense."

SELECTIONS OF FRUITS FOR CERTAIN DISTRICTS

NORTH OF ENGLAND AND SCOTLAND

APPLES.—†Alfriston, †Astrachan Red, *Allington Pippin, *†Beauty of Bath, *†Bismarck, Byford Wonder, Christmas Pearmain, Cockle's Pippin, Cox's Pomona, †Cox's Orange Pippin (wall), Col. Vaughan, †Claygate Pearmain, †Cellini Pippin, †Duchess of Oldenburg, †Devonshire Quarrenden, Domino Codlin, †Early Julian, Early Victoria, †Ecklinville Seedling, Emperor Alexander (wall), Early Red Margaret, Fearn's Pippin, †Galloway Pippin, *Gascoigne's Scarlet Seedling, †Golden Spire, †Golden Noble, *†Grenadier, *Hambling's Seedling, †Irish Peach, †James Grieve, †Keswick Codlin, †Kerry Pippin, †King of the Pippins, *†Lady Sudeley, †Lane's Prince Albert, Langley Pippin, †Lord Derby, *Lord Grosvenor, †Lord Suffield, Margil, Mother, †Mr. Gladstone, Mrs. Phillimore, Northern Greening, *Newton Wonder, Peasgood's Nonesuch (wall), †Pott's Seedling, Red Juneating, †Ribston Pippin, Rosemary Russet, Ross Nonpareil, *Royal Jubilee, Seaton House, Scarlet Nonpareil, †Summer Golden Pippin, or Ingestre, †Stirling Castle, †Stone's Apple, Striped Beefing, St. Edmunds' Russet, †Tower of Glamis, The Queen, *†White Transparent, †Warner's King, †Wellington, †Worcester Pearmain, White Juneating, †Yellow Ingestrie.

Cox's Orange may and does succeed in the open in many parts, but it is worthy of a wall in the North.

* Refers to sorts which, although not yet well known in the North, are likely to prove most desirable.
† Specially recommended.

CHERRIES.—Early Rivers, Frogmore Early Bigarreau, Governor Wood, Late Duke, May Duke, Morello, Napoleon Bigarreau, Windsor Bigarreau.

APRICOTS.—Breda (very free), Hemskerk, Moorpark, New Large Early.

FIGS.—Black Ischia, Brown Turkey, White Marseilles (all for open air).

NECTARINES FOR OUTDOOR CULTURE.—Dryden, Elruge, Humboldt, Lord Napier, Pine Apple, and others.

PEACHES FOR OUTDOOR CULTURE.—Condor, Dymond, Bellegarde, *Early Alexander, *Early York, Early Grosse Mignonne, Goshawk, Hale's Early (fine), Stirling Castle, Violette Hâtive, *Waterloo.

PEARS.—Aston Town, Baronne de Mello, Bellissime d'Hiver, *Beacon (Rivers'), Beurré Brown, Beurré Bosc, *Beurré d'Amanlis, Beurré Easter, *Beurré Capiaumont, Beurré Fouqueray, *Beurré Giffard, Beurré Hardy, Beurré Superfin, *Bon Chrétien (Williams'), Belle Julie, Catillac, *Colmar d'Été, Comte de Lamy, Conference (Rivers'), *Doyenné Boussoch, Doyenné d'Été, Doyenné du Comice, Durondeau, Emile d'Heyst, Fondante d'Automne, Fondante de Thirriott, General Todleben, Glou Morceau, Grosse Calebasse, Hacon's Incomparable, *Jargonelle, Josephine de Malines, *Louise Bonne of Jersey, Marie Louise, Marguerite Marillat, Nouvelle Fulvie, Passe Colmar, Pitmaston Duchess, Petite Marguerite, Souvenir du Congrès, Triomphe de Vienne, Thompson's, Uvedale's St. Germain, Verulam (baking), Winter Nelis.

* Will succeed in some situations as standards; the others are best on the Quince stock for south or west walls.

PLUMS.—As a rule these do well on walls in the North, and in some places as standard trees.—*Belgian Purple, Belle de Septembre, *Black Diamond, Blue Prolific, *Cox's Emperor, Comte d'Atthem's Gage, *Coe's Golden Drop, Denniston's Superb Gage, *Early Prolific (Rivers'), Gisborne's, *Green Gage (old), *Jefferson's Gage, Kirke's Blue, *Magnum Bonum (white), Magnum Bonum (red), Monarch (Rivers'), *New Orleans (early), Oullins' Golden Gage, Pershore Yellow Egg, *Pond's Seedling, *Prince Englebert, *Prince of Wales, Reine Claude de Bavay, Sultan, *The Czar, Transparent Gage (early), Transparent Gage (original), *Victoria.

DAMSONS.—Frogmore (early), *King of Damsons, Hereford Prune.

* For standards; rest on walls south or west.

RECOMMENDED FOR CORNWALL AND DEVON COASTS

APPLES.—*Dessert*.—*Lady Sudeley, Kerry Pippin, Mother, Egremont Russet, Cox's Orange Pippin, *Allington Pippin, *Mannington's Pearmain, *Old Nonpareil, Sturmer Pippin, *Boston Russet. *Culinary*.—Lord Suffield, Ecklinville, *Golden Spire, *Lord Derby, Warner's King, Bismarck, Wellington, *Alfriston, *Bramley's Seedling, *Lane's Prince Albert.

PEARS.—Jargonelle, *Louise Bonne, *Williams', Durondeau, *Doyenné du Comice, Pitmaston, *Emile d'Heyst, Glou Morceau, Beurré Diel, Bergamotte Esperen.

PLUMS.—*The Czar, Victoria, and Monarch for standards, and for walls *Denniston's Superb, Jefferson, Coe's Golden Drop, and Monarch.

PEACHES.—Hale's Early, *Bellegarde, Crimson Galande, *Dymond, Violette Hâtive.

NECTARINES.—Lord Napier, *Elruge, *Dryden, Humboldt.

STRAWBERRIES.—Countess, Gunton Park, Latest of all, *Monarch, *President, *Royal Sovereign.

* These are the most reliable.

CHAPTER XXIV

PROPAGATION OF FRUIT TREES

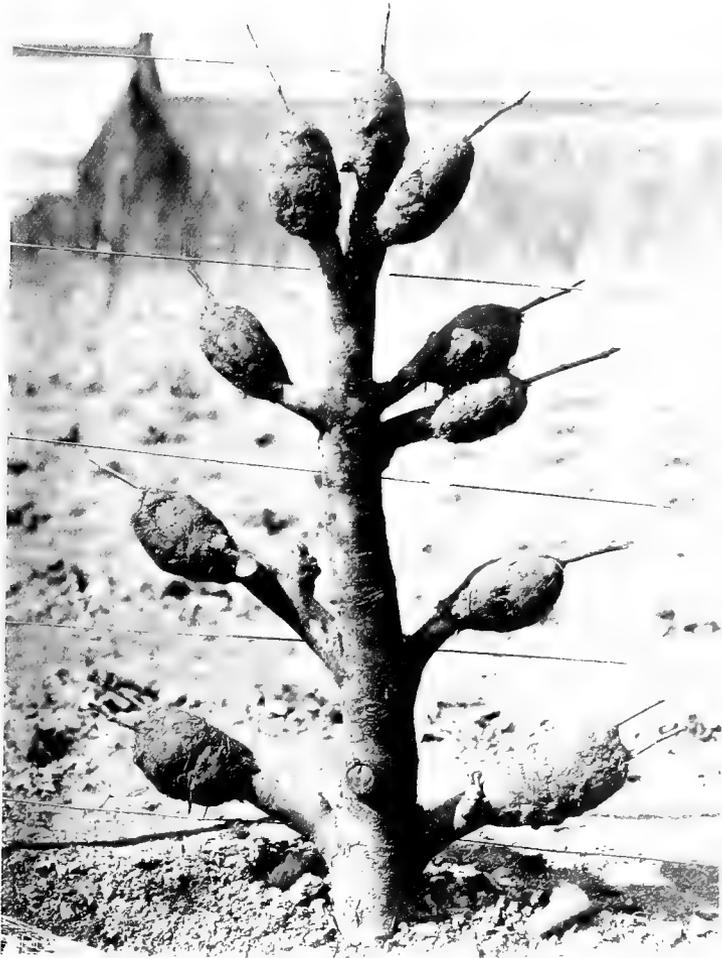
By GEORGE BUNYARD

APPLES, pears, plums, cherries, and quinces are increased by budding in August and September and also by grafting in March and April. The former is the easier operation. The union of stock and scion usually is more perfect and heals sooner upon budded trees than upon grafted ones. In either case it is important that the stocks made use of should be well established. They should be planted in November; grafting is best done in March and April. If the stocks are clean, healthy, and of free growth and planted before March, they can be budded the same season. If they are at all dried up by the July heat and growth is poor it is better not to bud them, but to graft them the following spring. Buds inserted when the bark of the stock does not easily separate from the woody centre are seldom satisfactory. Amateurs would learn more in ten minutes by seeing the operation done by some local gardener than by a long written description.

For grafting, the desired scions (*i.e.* the shoots to be grafted) should be cut from the tree and laid in a shady place and covered with soil two-thirds of their length, there to remain until required in March or April; then they take to the stock better. If the stocks are dwarfs they can be cut down at the grafting season, but if large espaliers or standard trees are intended to be grafted they should be cut back in February, and not grafted until the sap is rising.

There are three methods of grafting: (*a*) Whip-grafting upon small stocks; (*b*) rind-grafting upon older trees; (*c*) cleft-grafting upon large branches. In the first (*a*) the scion is cut with a long tongue, and a notch is made in the woody part to fit a corresponding notch in the stock, which is cut obliquely; the scion should exactly fit the stock cut to receive it. In *b* the outer rind or bark of the stock is raised with a chisel, the bark of the scion is removed, and the woody portion flattened and inserted under the bark. In *c* the end of the branch is opened with a chisel and mallet, and the graft is cut three-sided (wedge-shaped) to fit in the opening, two grafts can be inserted, if the branch is upright; if bending, one on the upper side only.

The work is first tightly bound round with Russian bast, then some clay, well mixed with short straw or horse manure, is placed over the graft and pressed closely around it to exclude air; wax may be used, composed of resin and tallow; this must be used hot. As soon as the grafts have "taken" and have made 1 foot of growth the clay or resin is removed and the ties are slightly loosened, but they are not removed for a month, until the union is



APPLE GRAFTING ON CUT BACK ESPALIER.



APPLE ESPALIER CUT BACK AND GRAFTED, AND RESULTING GROWTHS TIED IN.

complete. If the ties are not loosened they will cut into the stock and arrest its growth; a resting-place for insects is thus formed, and the hold of the scion is also weakened. The scion should be protected by a piece of split wood tied to the stock and the new scion-growth be supported by it, that high winds do not damage it. If the growth of the scion exceeds $1\frac{1}{2}$ feet it should be stopped; it is thereby strengthened. With dwarf trees a stake 3 feet long should be firmly placed in the ground and the new growth tied to it, so that the new tree may grow perfectly straight and upright.

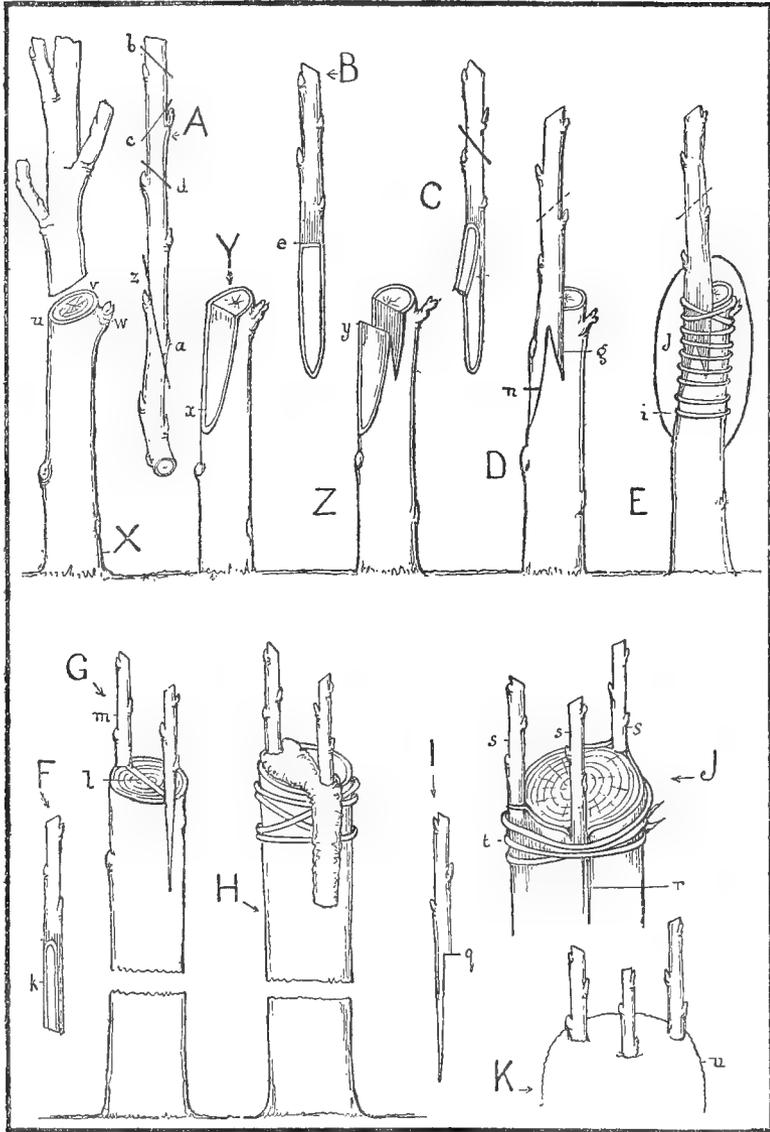
BUDDING.—The leaves should be cut off above the leaf-stalks from those shoots which are to furnish buds, and about 6 inches of the tops may also be cut off the shoots; place the ends in water. The stock is then prepared by making an upright cut $1\frac{1}{2}$ inches long and a transverse cut in a smooth portion, the two cuts together forming the letter **T**. The edges of the bark are then lifted (by the flat end of the budding knife) to receive the bud. The bud is cut out of the shoot by a bow-like cut and the ends gently bent, so that the woody central portion can be extracted. The bud is then inserted under the cut lips of the **T**-insertion as far down as it will go, with the "eye" upwards; press it down by applying the ivory end of the budding knife to the base of the leaf-stalk. If a portion of the bark protrudes beyond the **T** it is cut away, so that the "lips" fall over and envelop the bud entirely. Then lightly wind round with raffia, leaving the dormant bud exposed. After about fourteen days, if the leaf-stalk falls, the cut does not open, and the bud looks green, the ties must be loosened; later they can be removed altogether. It is important to note that the tiny neck or "pin" of the bud remains entire when the woody portion is removed; if that comes out when the wood is removed the bud will die. Therefore empty buds should not be inserted. Practice alone will insure celerity and good work. In the following April the bud will begin to grow; the shoot is then tied loosely to the stock to insure its growing upright, and in the late autumn or early spring the stock is cut away just above the bud in a sloping direction.

LAYERING.—This is accomplished by selecting a shoot towards the base of a bush or tree and placing the central portion a few inches below the soil, so that the shoot forms the letter **U**. The lowest point should be first notched so as to encourage the formation of roots and be well secured beneath the soil.

STOCKS FOR APPLES.—For orchard standards the Crab or Free apple stock may be used. For garden trees either the English or Dutch Paradise stock, or Rivers' Broad or Nonesuch varieties of it. None of these four stocks has any real advantage over the other, but the smaller growing apples best fit the first two, and the strong and sturdy ones the two latter.

PEARS FOR ORCHARDS.—These trees should be upon the Pear stock, which may also be used for espalier and other free-growing garden trees. But for cordons and pyramids the Quince stock should be used, as upon this the trees come into bearing very much more quickly. As "mothers" for double grafting, *Conseiller de la Cour* and *Marie Louise D'Uccle* are suitable.

PLUMS.—The two reliable stocks are the Brompton and the Mussel, the



PROPAGATION BY GRAFTING

former for most of the free-growing varieties, and the latter for damsons, most of the black plums, and gages.

CHERRIES.—The Wild Cherry stock is used for all forms of trees, but the Mahaleb can be used with advantage for the May Duke and Morello cherries.

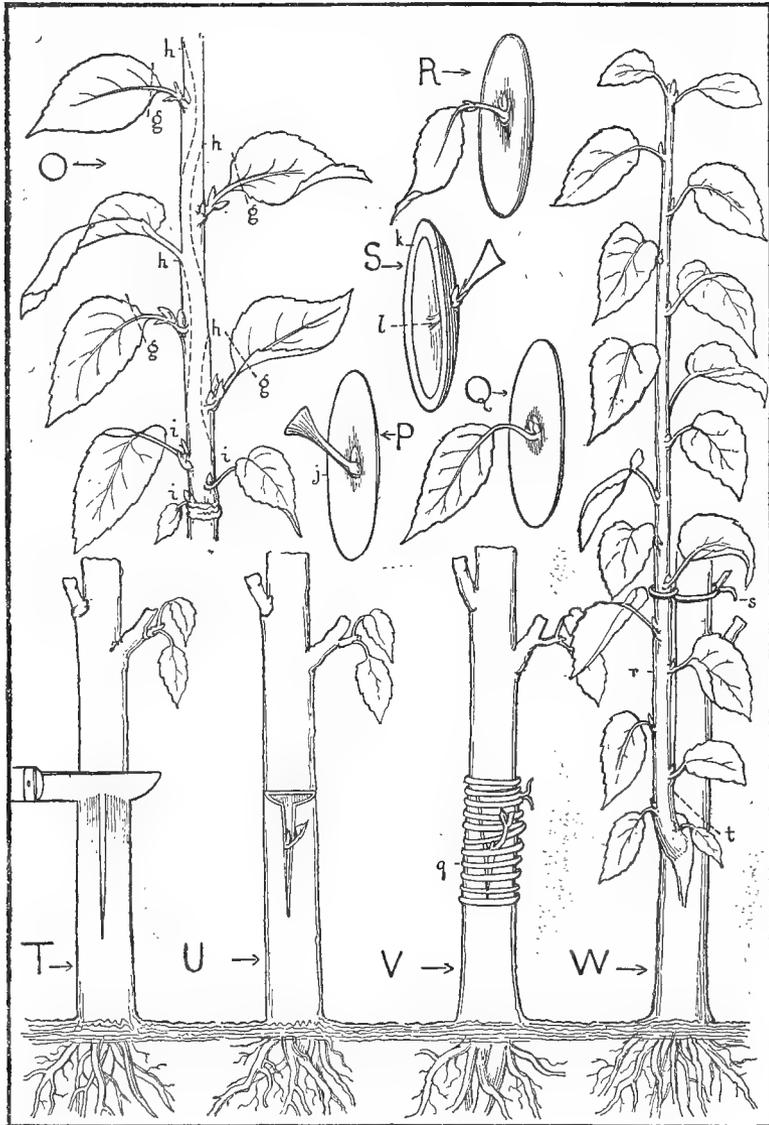
PEACHES AND NECTARINES.—The best stocks are the Brompton and the

PROPAGATION BY GRAFTING

TONGUE OR WHIP GRAFTING.—*x.* Stock with the top cut off to the distance from ground at which the scion is to be affixed; (*z*) point of inserting knife opposite a bud; (*v*) point of bringing out knife in making gently sloping cut about half an inch above the bud; (*w*) bud. *y.* Stock sliced; (*x*) slip made upwards to correspond with the slanting cut of the scion at least on one side. *z.* Stock tongued; (*y*) tongue, made by a slanting cut downwards and inclining inwards, a piece of wood being removed by a vertical cut from the top, thus taking out a wedge-like piece of wood (not necessary in small stocks and ordinary scions), and so forming a tongue pointing upwards. *A.* Scion or well-matured shoot of previous year's growth of the desired variety; (*s*) slanting cut from 2 to 3 inches long; (*a*) lowest bud removed; (*b*) buds left for vigorous stock; (*c*) buds left for a strong stock; (*d*) buds left for a weak stock. *B.* Scion sliced; (*e*) slanting cut made inwards at the upper edge of the cut about an eighth to a quarter of an inch deep, and slanting exactly the same as the top of the stock on which it is to rest; remove the small portion of wood with an upward cut; when the cut portion of the scion is placed against the cut part of the stock they must fit exactly, at least on one side. *C.* Scion tongued; tongue made by a slanting cut upwards and exactly fitting the cleft of the stock, though rather less than greater in width, but precisely the same in length. *D.* Scion attached; (*g*) tongue in cleft of stock; (*n*) bark of stock and scion exactly coinciding, at least on one side, thus bringing the inner barks together. *E.* Scion and stock tied and clayed; (*i*) material (matting or raffia) binding the scion and stock firmly together; (*j*) section of claying material to make junction air-tight (some use grafting wax). Subsequently keep the clay or wax effective, and loosen the ligature when the scion has made about 6 inches of growth, then place a stick close to the tree, tying the stock and scion to the stick so that no wind can move it. Whip grafting is sometimes performed without a tongue, the scion being prepared as shown at *B*, and the stock as shown at *Y*, and the two joined together as at *D*, but without the tongue. Then bind securely together, as at *E*, and cover with clay or wax; this is termed "Splice Grafting," and preferred by some as not weakening stock and scion so much as in tongue grafting.

CLEFT GRAFTING.—*F.* Scion; (*k*) wedge-shaped cut 2 or 3 inches long, a little thinner on the inner side opposite the bud, in order to insure close contact of the bark where the scion and stock join. *G.* Stock, top of a trunk or branch, with scions inserted; (*l*) cleft made by chisel and mallet right across trunk or branch, the chisel or a wedge being placed in the centre of the cleft to keep it open while the scions are inserted; (*m*) scions properly placed, always on one side of the cleft so that the inner bark is in contact with the inner bark of the stock the whole length of the scion; this is important, as if set a little too far out or a little too far in, failure must result. The wedge must be withdrawn carefully so as not to displace the scions. *H.* Cleft grafting completed; binding of soft tarred string and grafting wax; completely cover the cleft at the top and down the sides as low as the stock is split. The scions for cleft grafting may be as thick as the finger, and of wood two years old or more. They must be clean and healthy, and have two or three buds clear above the stock. Cleft grafting is suitable for stocks over 1 inch in diameter, upon which whip grafting cannot conveniently be performed. The main stem of a tree can be successfully operated upon, but it is better to make use of branches rather than graft when the trunks of the trees are of large size, grafting them at about a foot or 15 inches from the main stem. Three to five branches worked with two or three scions each, either by this or by crown grafting, form good heads, and come into bearing in two or three years.

CROWN GRAFTING.—*I.* Scion, about 6 inches long, of well-matured wood of previous year's growth with three plump wood buds at the upper end, lower part cut in a slanting direction 2 to 3 inches long, the same as the whip graft; (*q*) shoulder to fit top of stock. *J.* Scions fixed; (*r*) slit down through the bark in a smooth part, 2 inches long; (*s*) scions inserted in the stock, a hard wood wedge being used, shaped like the scion, but rather smaller; raise the bark, and insert the wedge in the centre of the cut at the top between the bark and wood and push it down about half an inch less than the cut part of the scion; into this opening the scion is pushed, keeping the cut part next the wood of the stock and pushed down so as to rest by the shoulder on the top of the stock; (*t*) binding of matting or raffia. *K.* Claying; (*z*) clay brought over crown of stock and extended downwards so as to cover the slit parts of the bark. Crown or rind grafting is easily performed, but the scions are liable to displacement by wind and other violence, hence the grafts must be secured to a stick fastened to the trunk or branch until they have a strong hold. Usually the best time for grafting in the south of England is from the middle of March to April; in the north, the first fortnight of April. Young stocks, as a rule, are ready to graft ten days to a fortnight before old trees. It is better to graft trees late than too early; do not graft until the sap is flowing freely in the stock. Stocks should be cut before the sap rises, or some time in advance of the operation, and near the points where the grafts are to be inserted.



PROPAGATION BY BUDDING

Mussell Plum. Most of them do upon either stock; some soils suit one better than the other, but only local experience can determine this. They are always budded in August.

APRICOTS are budded in August on the Mussell or Common Plum stocks.

BLACKBERRIES and **BRAMBLES** are increased by division of the roots, by cuttings of the roots, and by the tops of shoots inserted three-quarters of their length in the soil in March.

GOOSEBERRIES and **CURRANTS** are raised from cuttings, which are inserted three-quarters of their length below the soil in March. If wanted upon a stem all buds, except four at the upper end, are removed.

BLACK CURRANTS are best as low bushes; the buds must not be removed as the shoots which spring up from them furnish the tree with the young growths upon which fruit is borne.

FIGS are propagated by layers and cuttings, the latter being rooted in pots in a moderately warm house.

COB NUTS and **FILBERTS** are raised by layers; they do not come true from seed.

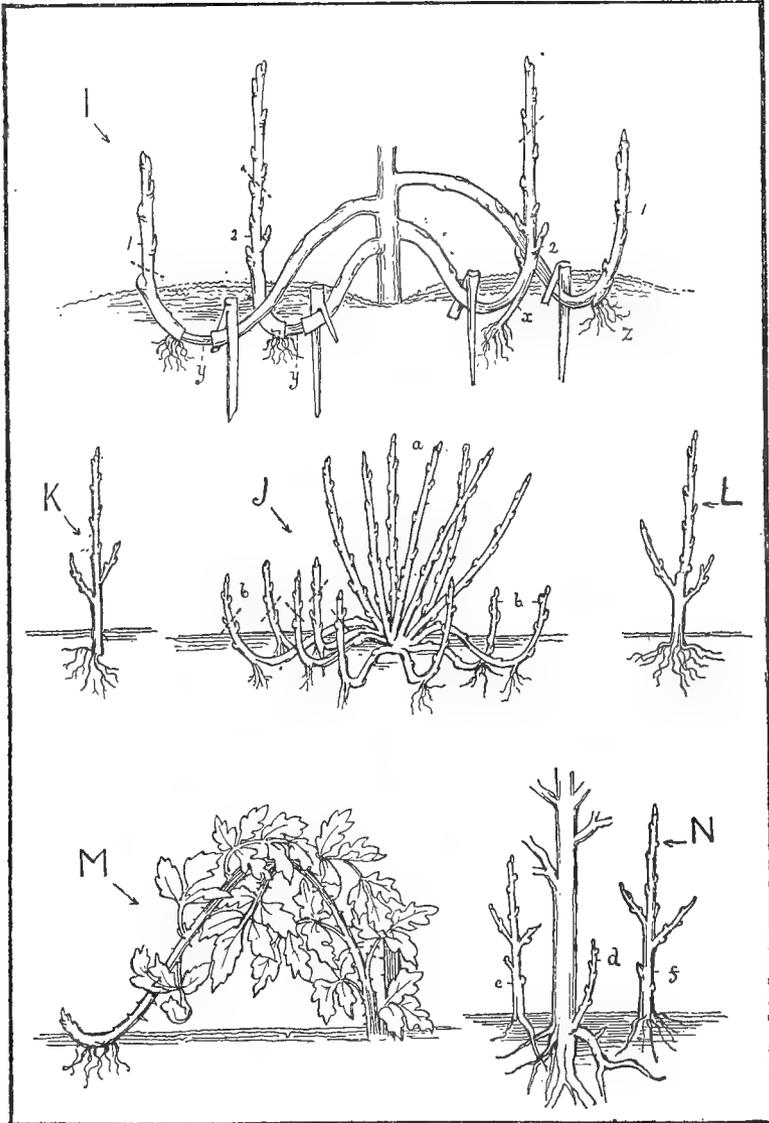
MEDLARS are budded on the Pear stock or the White Thorn.

PROPAGATION BY BUDDING

BUDDING.—*o.* Portion of a strong and well-hardened apple shoot of the current season's growth, showing mode of "taking" the buds; (*g*) point of cutting leaves, leaving part of the leaf and petiole (leaf-stalk) to serve as a handle to the bud; (*h*) dotted vertical lines indicate direction of knife in "taking" buds, the trimmed shoot being called a "stick." **NOTE.**—The upper buds of a shoot, often not fully developed and borne on soft wood, are usually discarded, as also are the small basal buds of the shoot (*z*). *p.* Proper bud, long and pointed; a wood bud almost always in the case of the apple and pear, but not so in the cherry, nectarine, peach, and plum; (*j*) shield or portion of bark and wood with bud and portion of leaf. *q.* Improper bud, rounded, stout and short; a blossom bud, such as occurs on the season's growth of the cherry, nectarine, peach, and plum, especially when weakly or stunted. *r.* Triple bud of peach, the centre bud being usually a wood bud, long, narrow, and pointed; whether there are one, two, or three buds, one must be a wood bud. *s.* Bud properly taken and prepared for insertion in stock; (*k*) bark exposed by cut of thin-bladed sharp knife in taking off bud; (*l*) part from which the wood has been removed leaving the eye intact. The whole bud is usually about 1 inch long.

INSERTING THE BUD.—*t.* Making incisions in stock; one vertical, an inch or inch and a half long, the other transverse, thus forming a T. Both cuts must reach through the bark only. *u.* Bud inserted, the corners of bark are raised a little so as to allow bud to be pushed in, this being done partly by the fingers and finished by the handle of the knife placed upon the leaf stalk; cut off the top of bud when the whole of it cannot be passed into the cleft. *v.* Bud tied; (*g*) bandage about 1 foot long, usually started below the bud, the end being held by lapping the second course over it, and the upper end being secured by drawing a bow through the second course. Take care not to bend over the bud itself. Attention afterwards is necessary to loosen or remove the bandage in due time. This may usually be done safely within a month, the portion of the stock below the bud should, in all cases, be kept clear of useless growths, but the shoots above must be preserved or very slightly shortened. In autumn the stock may be cut back to 2 inches above the bud, or a portion, 4 to 6 inches, may be left for securing the growth from the inserted bud. *w.* Growth from bud; (*r*) vigorous shoot; (*s*) secured to remaining portion of stock; (*z*) point of cutting off portion of stock above bud, performed when scion growth is about 12 inches high. A stake is necessary in some cases to secure the growth when no part of the stock is left.

HEIGHTS OF BUDDING STOCKS.—For root influence only, as the Quince stock for the pear, 3 inches; for trees generally on dwarfing stocks, 6 inches; for trees required with a stem or branches not nearer the ground than 1 foot, 9 inches; and standards not having stems of their own should be budded at the height of stem desired. The time of budding depends upon the season and condition of growth. Cherries and apricots are sometimes ready by end of June, but later is preferable. Always do this work while the bark, with the bud, can be properly detached from the wood. The order of budding may be taken as follows: first, cherries; second, apricots; third, plums, apples, pears; fourth, nectarines and peaches; fifth, walnuts.



PROPAGATION BY LAYERS AND SUCKERS

QUINCES are raised from cuttings ; these, 1 foot long, are inserted in March.

RASPBERRIES are increased by suckers taken from the old plants.

WALNUTS and CHESTNUTS are raised from seed sown in April.

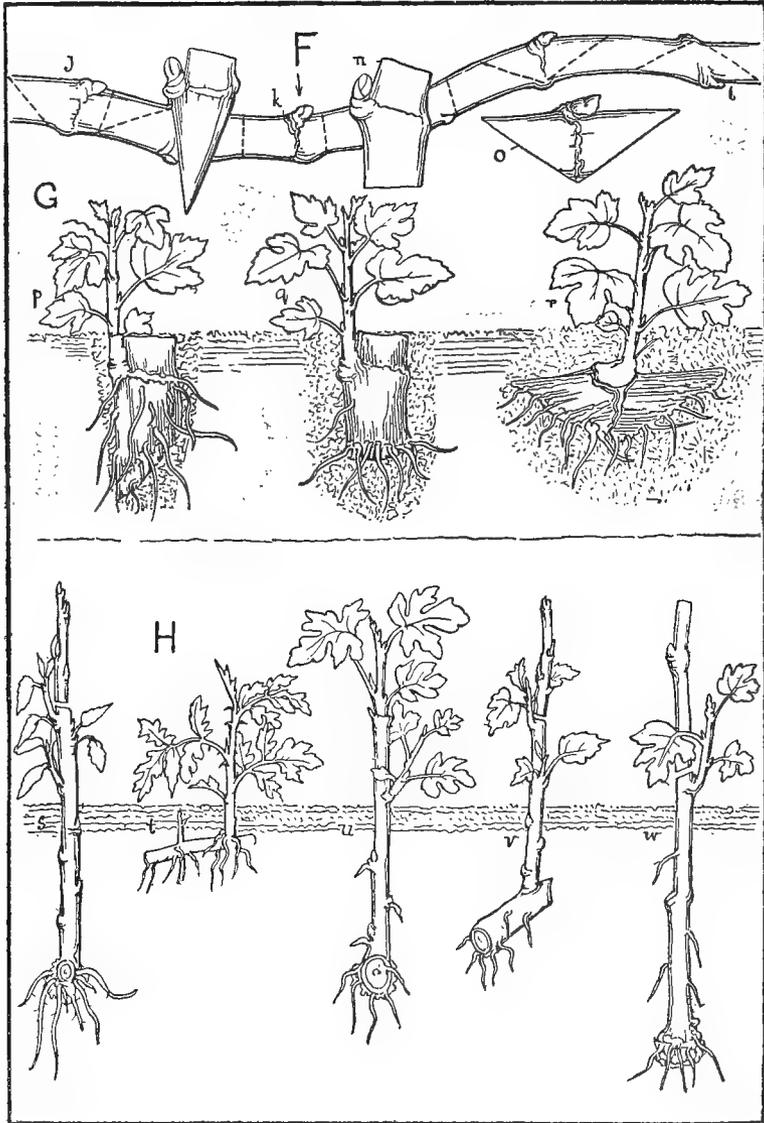
PROPAGATION BY LAYERS AND SUCKERS

LAYERING.—I. Various modes ; (*x*) tongue-layering, *i.e.* cutting the branch half-way through below a bud or joint and making an incision upwards, keeping it open with soil, or a small stone ; (*y*) ringing, *i.e.* taking off a ring of both the outer and inner barks not less than half an inch wide, leaving nothing but the wood ; (*z*) notching, *i.e.* making a transverse cut half-way through the branch just below a joint, and with a slanting cut upwards taking out a piece of wood. In layering, all buds not wanted to grow must be removed, especially from the part below the soil ; the layers in each case must be secured with a peg inserted near the point of manipulation, covered with good soil 3 to 4 inches deep, and kept moist to encourage rooting. The layers may be of one-year-old (1) or two-year-old wood (2), left entire or shortened (dotted cross-lines).

LAYERING FOR SECURING STOCKS OF APPLE, PEAR, PLUM, AND QUINCE FOR BUDDING AND GRAFTING.—J. Stock plant, kept very low or cut down level with the soil for encouraging as many good shoots as possible ; (*a*) shoots not layered ; (*b*) shoots layered. The process here shown is tongue-layering, but the notching process is as commonly practised ; the layers are generally left with one or, at the most, three buds above the soil, as indicated by dotted cross-lines, though sometimes they are left entire. K. A shoot of the previous year's layering then left entire, now detached and planted for budding or grafting in due course. L. A layer of the previous year, then left with three buds above the soil, detached in the autumn following and properly planted.

LAYERING SHOOT-TIPS.—M. Cane from plant of blackberry, with point of the cane bent over and covered with good soil in August ; roots are freely emitted, and in the autumn a strong bud, "crown" or "eye," is formed for next year's growth, the parent cane being severed at the ground level. The young plant can then be planted where desired. Currants and gooseberries may be layered in the same way, selecting the points of firm shoots and layering them in freshly turned soil in summer. Secure with a peg if necessary, and by autumn a quantity of roots will have formed ; the plants can then be detached and transplanted.

SUCKERS.—N. Root stock of filbert ; (*d*) stem sucker, not usually desirable as it can seldom be detached with good roots ; (*e*) attached sucker produced at some little distance from stem, and with a fair amount of roots, such being suitable ; (*f*) sucker or "spawn" properly detached, and with good roots for lifting and planting. Suckers of similar nature from plum, damson, and other trees are sometimes used for increase of the respective varieties, or for stock. Apple, pear, plum, and quince stocks are sometimes raised from suckers. The stock-plants, called "stools," are cut down level with the ground or nearly so, and the resulting shoots, when one year old, are earthed up with good soil about 4 or 6 inches high, and emit roots freely in summer. Lifted in the autumn following and planted they form suitable stocks for budding or grafting in due course.



PROPAGATION BY "EYES" AND CUTTINGS

CHAPTER XXV

WHOLE - FRUIT PRESERVATION

By S. PONDER (*Confectioner to Her Late Majesty Queen Victoria*)

THERE are many owners of gardens who, during summer and autumn, have surplus fruits—peaches, nectarines, apricots, cherries, and pears—which they would like to preserve for winter and spring use. In this chapter is detailed a method practised by me for many years with invariable success. In all cases the fruit to be preserved must be gathered before it is quite ripe, and the greatest care observed in handling it, so as not to bruise it, for every mark will show in the preserved fruit.

PEACH AND NECTARINE.—Have ready as many large-mouthed bottles as are required, taking care that they are perfectly clean and dry. Cut the fruit into halves or quarters, according to size; place them in the bottle with the aid of a piece of flat wood or the handle of a tablespoon, having previously peeled the skin off carefully. Have some syrup ready, which must be applied cold. This is prepared as follows: To one pound of loaf-sugar add one pint of cold water; place on the gas-stove or fire, and boil gently for ten or fifteen minutes, skimming the scum off as it rises to the surface; draw the pan off the fire and set in a cool place until cold. Have some well-cut corks ready that will fit tightly. Pour the syrup on the fruit so as to cover it, but only up to the lower part of the neck of the bottle, allowing a space of about $1\frac{1}{2}$ inch between the syrup and cork after

PROPAGATION BY "EYES" AND CUTTINGS

EYES, OR ONE-BUD CUTTINGS.—F. Portion of a vine cane marked for cutting into "eyes," or bud cuttings; (*j*) wedge-shaped; (*k*) transverse cut above and below eye; (*l*) triangular one-bud cutting; (*m*) vine cut transversely above, wedge-shaped below; (*n*) vine eye cut transversely above and below; (*o*) vine eye cut from the back upwards and downwards, forming a triangle. G. Vine eyes properly inserted and growing; (*p*) the wedge-shaped, rooting from old wood with great freedom and growing strongly; (*q*) transversely cut above and below bud, such usually forming spreading roots; (*r*) triangular bud, with roots forming freely. Eye, or one-bud cuttings of the fig are prepared in a similar way, the wedge-shaped being the best.

CUTTINGS OF VARIOUS FORMS (those of Currants and Gooseberries are shown in the Chapters dealing with these Fruits).—H. Apple, blackberry, fig, mulberry, and vine; (*s*) cutting of apple, a well-ripened shoot of the previous summer's growth taken off the branch from which the cutting springs, with a heel or piece of the branch. The buds are removed from the part intended to be inserted in the soil, which should be about 6 inches or two-thirds of the length of the cutting, shorten it, if long, to two or three buds above the soil, roots are formed from the heel of the two-year-old wood; (*t*) cutting of blackberry root about $\frac{1}{4}$ to $\frac{3}{8}$ inch in diameter, and 2 inches in length, planted nearly horizontally and 1 to 2 inches deep in loose, rich soil; (*u*) cutting of fig with a heel, roots are formed from the latter and from joints; (*v*) cutting of mulberry, with portion of two-year-old wood; (*w*) cutting of vine with three joints, inserted to the base of the highest bud, roots form at the base and between the joints. Great care is needed to cut out all buds on parts below the soil, except with the blackberry root-cutting.

the former is put in ; the cork should be first pressed in a cork-presser and well rinsed in cold water before being put in the bottle ; then with some tough string tie over the cork three times, securing the string tightly under the rim or neck of the bottle. The bottles being filled and securely corked, place them in a deep copper or iron pan on a fire or gas-stove. Arrange some slips of flat wood in the bottom of the pan, a little distance apart, so that the bottles may rest firmly on the wood without touching each other or the sides or bottom of the pan.

Fold each bottle in a cloth or a piece of coarse linen, and arrange them carefully in the pan ; then with cold water fill to the level of the lower part of the neck of the bottle. Cover all over with a coarse towel or other material ; place the pan on a gas-stove or fire, heating the contents quickly almost to boiling point. For this work it is well to be provided with a metal thermometer, which should be placed in the centre of the pan between the bottles, and as soon as the quicksilver rises to 200 degs. Fahrenheit immediately take the pan off the fire and place with its contents in a cool room or cellar, and there let it remain until quite cold. Then take out the bottles, and place in a cool cellar or cupboard until wanted. This is a simple and economical way of preserving summer fruits for winter dessert, and that without the aid of chemicals or spirits of any kind, to the use of which many have a strong objection. Preserved in this way, the fruit will remain in perfect condition for many months.

APRICOTS.—The fruits should not be quite so ripe as in the case of the peach and the nectarine. At the same time they should be fairly ripe and properly coloured, but the flesh must not be too soft. Remove a few of the stones, adding the kernels (after peeling them) to the fruits, about eight kernels to a bottle. It will be found that apricots are more difficult to peel than peaches, therefore a small sharp knife should be used, taking care to peel as thinly as possible and not to injure the flesh. They must be cut in halves or quarters, and given the same treatment afterwards as detailed for the peach.

CHERRIES, MORELLO OR SWEET.—For preserving these the following will be found an excellent plan. The fruit must be sound and unblemished and gathered perfectly dry. Cut the stalks, leaving them about half an inch long, and arrange in the bottles so that the stalks have no chance of piercing the fruit. To each quart of best pale brandy (which should be 10 or 15 under proof) add three ounces of brown sugar candy. This must be crushed thoroughly, mixed with three or four ounces of water, and then heated so as completely to melt the sugar ; when cool add it to the brandy. The bottles must be filled with the brandy after the sugar has been added, covering the fruit and reaching within an inch of the rim of the bottle. Place a piece of well-softened bladder over the mouth of the bottle, and carefully press a well-fitting bung into it. It should go in about half or three-quarters of an inch ; then tie down with a piece of string, as in the case of the peach, and place in a cool, dry cupboard. At the end of two or three months, untie the string, take out the bung, and add one or two ounces of the candy and brandy syrup, to replace the quantity absorbed by the fruit. A small piece of vanilla, two or three inches long, may with advantage be added. Replace the bung and tie down. The cherries will be fit for

dessert in the course of a month, or they will keep in excellent condition for two years or longer.

PEARS.—As regards these, any variety with solid flesh—such as Easter Beurré, Beurré Bosc, and Vicar of Winkfield—will answer the purpose well (I prefer the latter to any others). The pears must not be fully ripe (only fully grown and partly ripened). They must be cut in halves or quarters, according to size, peeled, the cores removed, and placed in a pan of water to which a little lemon juice has been added, until all are ready. Place some syrup (rather weaker than for the peach) in a pan to boil; lay in ten peeled pears, and gently bring to boiling point. Let them simmer until a little tender; then take the pan off the stove and place the fruit carefully in a bowl or basin with the syrup they were boiled in, and of which sufficient must be placed in the bowl to float them. Place the bowl of fruit on one side in a cool place until next day, when the fruit must again be placed in the pan and a little more candied sugar added to the syrup. Simmer all up again, and replace in the bowl as before. Early next morning the pears and syrup in which they have been simmering must be placed in bottles and finished off in the same way as mentioned for the peaches; or they may be bottled as recommended for cherries, but in this case white brandy is recommended in preference to the darker sort; also, it is well to add a little more sugar.

CHAPTER XXVI

INJURIOUS INSECTS AND DISEASES AFFECTING FRUIT TREES

By J. J. WILLIS

IN the culture of fruit, whether in the orchard, open garden, or under glass, the question of injurious insects and diseases is apt to be looked upon with some amount of dismay, but after all these are rarely to be counted upon as permanent factors, and considered rightly they are the direct and perhaps the most efficient means of keeping the fruit grower in a state of mental alertness.

There are three general types of difficulties in fruit growing, which have been classified by Professor Bailey as follows:—

1. Attacks by insects.

(a) The damage by those insects which eat or chew a part of the plant, and which, therefore, are killed by the application of some poison, such as Paris green. These insects include the whole tribe of caterpillars, worms, and beetles.

(b) Attacks of insects which suck their food, and which are, therefore, destroyed by caustic applications which injure the bodies of the pests. All the tribes of plant lice and scale insects may be placed under this heading, and for these kerosene emulsion, resin washes, and the like are the specifics.

2. Parasitic fungoid diseases, such as the apple scab, mildew of the grape, leaf blight of the plum and pear, currant gall, canker, and the like are characterised by definite spots, discolorations, or excrescences, which are more or less distributed over the surface of root, branch, leaf, or fruit. As a rule, the leaves and fruits which are attacked have a tendency to drop from the tree. The general treatment for these diseases is to spray with some fungicidal mixture. The treatment is useful in proportion as it is applied early and thoroughly. After the disease once gets into the tissues of the host plant, it is difficult, if not impossible, to kill it. If, however, the fungicide is applied before the parasite gets permanently established there will be less danger of its obtaining a foothold. Even if the fungus has made headway, a thorough spraying will check its progress.

3. The physiological and bacterial diseases or those which are termed constitutional troubles. In these cases there are rarely any definite spots, as in the attacks of parasitic fungi, but the entire leaf, or even the entire plant, or a large part of it, shows a general weakening by disease, as if there were some cutting off of the accustomed source of nourishment. Such diseases are very likely to be seen in the general yellowing and dearth of the foliage; in the dying of the

leaf along the main veins and around the edges, showing that the difficulty is one which affects the entire leaf, and not any particular part of it. In general there is a tendency for the foliage in plants so attacked to wither up and hang on the tree for a time. There are no specific treatments for troubles of this sort. The diseased plant or parts must be cut away and burned. All the conditions which seem to favour the development of the disease must be removed. Careful management in matters of sanitation is often much more important than any attempt at specific treatment.

Injurious insects follow swiftly on the heels of disease, and disease is usually further strengthened by the destructive agency of insect pests.

So far as our experience shows, the protection of our fruit crops from insect ravages is likely to be an increasing difficulty, consequent on the increasing extent of the areas in which one kind of orchard tree or fruit bush is grown year after year, thus giving every opportunity for the established settlement of the insect feeders on that special crop.

APPLE

Under proper treatment the apple tree is rarely affected by either disease or insects. It is chiefly when injured by mismanagement, starved for want of plant food, or too heavily cropped, that trouble ensues. Soil and climate are powerful factors in the production of apple disease, and also frequently invite the attacks of insects. The chief causes of injury may, therefore, be stated to be over-luxuriance or weakness of growth.

The chief diseases that attack the apple are canker, mildew, and American Blight. The first is caused by bad drainage, the second arises from many and the most opposite causes, such as improper manuring, over-cropping, excess of heat or moisture.

The attack of the woolly apple aphis, commonly known as American Blight, may be taken as an example of orchard infestation which is exceedingly common, and is very injurious by destroying the health of the tree, and yet at the same time is so open to remedy that it may with little expense or trouble even be stopped at the outset. The presence of the apple bark plant louse or woolly aphis may be easily detected by the cottony growth on the insects, giving the appearance of a white film. When there are many it appears as if a knot of cotton wool were sticking to the bough or even hanging loose in pieces several inches in length.

With regard to remedies; soft soap, tar, or, in fact, anything oily, greasy, or sticky that can be well rubbed on, and which by adhering for a time will choke all the aphides that it touches, will be of use.

Other insects that attack the apple are the green-fly (*Aphis mali*), codlin moth (*Carpocapsa pomonella*), blue-head caterpillar (*Diloba cæruleocephala*), goat moth (*Cossus ligniperda*), lackey moth (*Bombyx neustria*), lapped moth (*Gastropacha quercifolia*), small ermine moth (*Hyponomeuta padellus*), apple saw-fly (*Hoplocampa testudinea*), and apple blossom weevil (*Anthonomus pomorum*).

Of all these pests probably the codlin moth is most frequent and persistent,

because the attack is one of the regular recurring yearly troubles of the fruit grower, and although the maggotty or worm-eaten condition of the young fruit, which we know only too well as causing it to fall in quantities before it is large enough to be of any use may sometimes arise from apple saw-fly presence or from other infestation, yet for the most part the mischief is due to the larvæ of the codlin moth. Other of our orchard fruits are also liable to this infestation; pears, plums, peaches, quinces, and apricots are sometimes much injured. Walnuts and chestnuts also have been found to be infested. As a prevention and remedy, the following plan may be adopted: Wind a hay-band in three coils tightly round the trunk of a tree at a little distance from the ground, and apply other hay-bands to the larger branches. These bands should be placed around the tree early in June, and kept on till fruit harvest; further, they should be pushed up or down and the worms or chrysalids crushed that were under them every week or two. Also the trunk of the tree should be kept free from rough old bark so as to give the worms no other place of shelter, and, lastly, the ground itself should be kept free from rubbish.

CHERRY AND PEAR SAW-FLY (*Selandria atra*).—The small blackish moist-looking larvæ of the cherry and pear saw-fly, known as slug-worms, from their great resemblance to the little slimy slugs feeding on the upper sides of the infested leaves, are often not recognised as caterpillars from their very peculiar appearance, from which they take their name. They feed on the leaves of cherry, pear, plum, and sometimes on peach and quince, and they do serious mischief by devouring the skin of the upper side of the leaf, so that the remainder appears like a network of veins held together by the skin of the lower side, which is left untouched and turns to a deep brown colour. The destructive work of the caterpillars can be at times very rapid and complete. The attack may be checked by dusting or spraying. The caterpillars, if annoyed by throwing a caustic powder on them, such as quicklime or gas-lime, can throw it off at first by exuding a coating of slime, and thus, as it were, moulting off the obnoxious matter; but they cannot continue this process, therefore a second application of the powder (soon after the first) takes effect and kills them. If a good time is allowed to elapse between the dressings they will have regained the power to produce the slime exudation, and the application will do little service. Heavily syringing the tree with strong soapsuds applied by a powerful garden engine are very effective in getting rid of this pest. Also a liberal dressing of lime and soot well mixed together is a capital remedy; in this case a thorough washing of the foliage on the following day, so as to clear off the adhering coating, is needed to complete the work.

CURRANT

CURRANT APHIDES or **GREEN-FLY** (*Aphis ribis*) are injurious by crowding upon the under side of the leafage, and by their innumerable punctures and drawing away of the sap, give rise to the brightly-coloured blistered growths so often seen on the upper side of the currant leaf, and in bad attacks nearly

the whole of the foliage will be distorted and crumpled out of shape and the fruit will be blighted. Where much damage is being caused, it is a good plan to break off the leaves and burn them. In dry weather plentiful waterings, so as to keep up good growth of the foliage, are a great check to aphid increase.

CURRANT GALL-MITE (*Phytoptus ribis*).—The deformed bud-growths, which for many years have been a source of great trouble to black-currant growers, are caused by an exceedingly minute mite, too small to be seen by the naked eye, which propagates in the buds and causes an unnaturally large development of these into spherical green knobs, formed outside of greenish scales or abortive leaves folding over each other, and inside of the various parts which would gradually have developed into leaves, flowers, and fruit, but are ruined by the action of the mites. These knobs may be found forming during the winter, while the healthy buds are still of the natural shape, and in January will have attained to as much as a quarter of an inch in diameter, and containing within them numbers of the mites and some eggs.

PREVENTION AND REMEDY.—The method which is most frequently tried is breaking off the galled buds and burning them, and though in this way many of the mites are got rid of which would have otherwise spread infestation, yet the plan is very far from answering as could be wished. Among treatment from which some amount of good resulted was a dressing of 2 lbs. sulphur and 2 lbs. lime, boiled together in three gallons of water, further diluted at the rate of two or three pints to a large pail of water, and applied with a syringe to the infested bushes.

GOOSEBERRY

The gooseberry when planted in suitable soil is peculiarly free from disease, but several insect pests are very troublesome. Among others may be mentioned the magpie moth (*Abraxas grossulariata*), dot moth (*Mamestra persicariæ*), gooseberry and ivy red spider (*Bryobia prætiosa*), gooseberry and currant sawfly (*Nematus Ribesii*), and the gooseberry and currant scale (*Lecanium ribis*). The greatest amount of damage is probably done by the magpie moth and the sawfly caterpillar. The pretty butterfly-like magpie moth is one of the most widely distributed garden leafage infestors. The common garden food plants of the caterpillars are gooseberry, red and white, and sometimes black currant, and the foliage of apricot and pear is also attacked.

PREVENTION AND REMEDY.—The habit of the caterpillars of wintering in leaves (spun together) still hanging on the bushes, or sometimes lying among any shelter on the ground beneath, must be taken advantage of to get rid of the pest. At pruning time the bushes should be carefully gone over to make sure that there are no leaves which may hold a caterpillar. When currant bushes are trained on walls search is especially requisite. The longer the pruning can be deferred the better. Pruning and dressing under the bushes should not take place until after the fall of the leaves. All the pruning and possibly infested rubbish from beneath the bushes should be collected and burnt. Flowers of sulphur dusted on the leaves when the dew is

on, or a liberal application of soot similarly used, are serviceable remedies and safe.

The gooseberry and currant saw-fly attack is perhaps one of the most destructive that bush fruit growers have to contend with, on account of its frequent recurrence and the great powers of ruining the leafage of the attacked leaves, even by scores of acres. The life history is that the female saw-fly appears about May and lays her eggs beneath the skin of the leaf. The grubs soon hatch and begin feeding on the leaf where they are placed, which they pierce full of holes, and continue to feed upon until all the leaf, excepting the mid-rib, is devoured. Thus they continue their work of destruction, moulting from time to time, and hanging on to the leaf with their fore legs, their tails in the air. After the operation of casting the skin for the last time, they bury themselves in the soil to turn to the pupal state, from which the saw-flies come out in three weeks in summer, or in the case of late broods in the following spring. For prevention of attack, excepting what may be borne on the wing by stray saw-flies from elsewhere, the most certain plan is autumn or winter removal of surface soil from under the bushes. A deep hole should be dug in some other place into which the removed soil with whatever may be in it is buried. The soil under the fruit bushes may be replaced by that taken out of the hole, with the addition of some manure. Hand picking is recommended, also dressings of sulphur powder when the dew is on the bushes.

THE PEAR

The pear gnat midge (*Diplosis pyrivora*) is a very frequent trouble to pear growers, from the damage caused by its little legless, yellowish white maggots, living in numbers inside the young pears in their very early state. Consequently, on the maggots feeding within the fruits the growth of the young pears is checked and stunted, the centre decays, and they crack or die and drop off. As preventive measures, in cases where the crop is in reach, pick off the little stunted pears, also gather up the fallen fruit and destroy as soon as possible. To this treatment a thoroughly good shaking of the boughs of the infested tree so as to bring down the injured fruit will be of service. Also spreading a coat of quicklime on a dry day beneath the infested tree and then slaking it, might have a good effect in killing the escaping maggots. When pears are grown in grass orchards a deal of the fallen infested fruit would be cleared off by having sheep on the ground. If the tree roots are not too near the surface the plan of turning the earth with its contained pests would answer well. The pear leaf disease known as "blister," which is caused by a minute cylindrical four-legged mite (*Phytoptus pyri*), does great harm to pear leafage. Where there are only a few leaves infested, or the trees are small, it is well to pick those leaves off and burn them as soon as the attack is observed. Most of the insects that prove disastrous to the apple may frequently be found on the pear, and should be dealt with as already described.

THE PLUM

The plum aphid or green fly (*Aphis pruni*) is to be found on apple, medlar, peach, and apricot, besides the plum, and is exceedingly destructive. Multiplication of the insects takes place by millions, and these close up the pores of the leaves by their tenacious excretions and the mealy exudations from their bodies. They are to be found collected in numerous colonies on the under sides of leaves of the young shoots, and are sometimes found in parties on the stems of the green fruits.

As a REMEDY, washes with a foundation of soft soap are the most desirable, because they have the great advantage of sticking in some degree to the aphides, which is necessary in order to kill them.

The winter moth (*Cheimatobia brumata*) is perhaps the most injurious of all our orchard insects. In some years, when favoured by drought and heat, the mischief is widespread. The caterpillars prey on the leaves and buds of plum, apple, pear, cherry, and nut, and sometimes on currants. In regard to this pest it may be well to call attention to the fact that where young trees are fastened to stakes it is necessary that something be done to stop the traffic up these supports, and thence to the trees; also where bundles of sticks are tied round the trees to prevent their being gnawed by animals, the guards themselves will probably be a source of caterpillar attack at hatching time in spring unless well looked after. The guards or stakes, therefore, should be well tarred, and a greased band placed on the tree above the supports or protections.

The following method of grease-banding for fruit trees was suggested by the late Miss E. Ormerod, LL.D., which recommends itself by its simplicity and cheapness, a consideration when some hundreds of trees have to be attended to. The material employed is a kind of tough paper, which is used by grocers for wrapping up butter, lard, and the like, and is known as grease-proof paper. This is applied by a band, as many inches wide as is thought fit (the wider the better), being passed round the stem of the tree. The band should be cut long enough for the ends to overlap well, and these are fastened by paste. The whole is made secure by a piece of bast mat tied round the paper near each edge. This work can be rapidly and well done by women. On the paper bands the grease may be spread in any way preferred, but the best way is considered to be to lay it on with a thin, flat piece of wood, and plentifully, both as to width of band and thickness of layer.

THE VINE

Probably of all the fruits under hot-house culture the vine is subject to far more diseases than any other. The most troublesome is that known as shanking, the next worst being mildew.

Shanking generally makes its appearance just when the berries begin to change colour, and is continued with more or less activity until the crop is ripe. It is first detected by the formation of a slender black thread round the

berries, healthy growth is arrested, the stalks lose their vitality, and the berries become shrivelled and very sour. The primary cause of shanking will be found in the stoppage of a proper flow of healthy sap. This may be caused by a soil overcharged with organic matter, which condition, combined with bad drainage, causes acidity of the soil; the vine will then develop luxuriance rather than maturity and ripeness of wood. It may be that the foliage has been destroyed by red spider, invited by too dry an atmosphere and too high a temperature. A never-failing remedy for shanking is to raise the roots and relay them in new compost composed of good virgin turf.

MILDEW (*Peronospora viticola*).—This fungus causes two forms of disease. If the leaf is attacked the disease is called downy mildew; if the fruit, it is known as brown rot. Leaves affected by this fungus show upon their upper surfaces spots of a greenish yellow colour, while on the under side of the leaf opposite these spots may be seen a peculiar downy or frosty growth. These spots may be quite small and few in number, or very abundant, the frosty growth almost covering the lower surface. When the fungus is abundant, the leaf soon yields to the disease, turns brown, and falls from the vine. In severe cases the disease extends to the young branches. The attack upon the fruit is generally early, causing many of the berries to cease growing, turn brown, and fall off. In treating grapes for this disease, Bordeaux mixture may be used with good effect. Early washing of the vines is of advantage in freeing them from spores which may have found lodgment in the crevices of the bark.

POWDERY MILDEW (*Uncinula spiralis*).—This disease usually makes its appearance about the middle of summer. It attacks the leaves, young shoots, and fruits, covering them with a powdery growth. It differs from the downy mildew in covering the upper surfaces of the leaves with white patches of various size and shape. Sometimes it spreads quite early over the surface and resembles a delicate spider's web. It does not send filaments into the tissues of the host plant, but taps the epidermal cells with numerous minute suckers, and through these saps the adjoining cells, while all the filaments are spread over the surface of the leaf. The fruit when attacked shows upon the surface a whitish dust. This rapidly spreads, and soon the berries shrivel and the skin cracks, admitting other spores of decay, which complete the destruction of the fruit. Being confined to the surface, this disease yields to the application of almost any fungicide, but flowers of sulphur is probably the best.

INSECT PESTS

RED SPIDER (*Tetranychus telarius*).—With the exception of the phylloxera, red spider is the most general and troublesome pest of the vine. It is not a true spider, but belongs to what are called spinning mites. It has a difficulty in moving on perfectly smooth surfaces, but by means of its claws and the pin-headed bristles with which they are furnished, it moves readily on the under sides of the leaves, and fastens its threads to the hairs or slight prominences, thus gradually forming a coating of web, among which it lays its eggs, and under this shelter a colony increases with alarming rapidity, especially if the

house is kept hot, dry, and badly ventilated. The colour is various, depending on the nature of the food; possibly, also, in some degree on the age of the individual. The attacked leaves may be known by their greyish marbled appearance above, while beneath they are whitish and slimy from the covering of the web. The red spider is most injurious to vines in hot, dry weather, consequently washing and syringing, which will render the leafage and ground moist, are serviceable. The extreme dryness of the air and soil are thus counteracted and a healthy growth encouraged, which more or less counterbalances the injury to the leaves from the suction of the mites. It is important to check the attack at the very beginning, and for this purpose syringings morning and evening are advised, sent hard at the under side of the leaves so as to break the webs and wash them down with the contained mites. Sulphur and soft soap combined in various ways are the most reliable remedies.

THRIPS (*Thrips minutissima*).—This insect is of a dark brown colour or almost black. It feeds upon the leaves of the vine, thereby interfering with the proper elaboration of sap, and being a dirty insect it soon spoils the fruit. Like the red spider it flourishes best in a dry atmosphere. If taken in time sponging with kerosene emulsion will be found a thoroughly effective remedy.

MEALY BUG (*Dactylopius adonidum*).—This pest is one of the most troublesome met with in vine culture. When once introduced it spreads from the branches to the shoots, and thence to the fruit. A good remedy is to apply a coating of methylated spirits with a soft brush. Fir tree oil and paraffin in a diluted form also cause death to the pests.

THE VINE LOUSE (*Phylloxera vastatrix*).—Of all the insects with which the grape grower has to contend this is the most terrible, and no certain remedy for its destruction has yet been discovered beyond that of taking out all the vines and burning them, together with the soil in which they grow, thoroughly cleansing, painting, and lime-washing the houses, then replanting with fresh vines.

CUCUMBER AND MELON

As recently as 1896 a new species of leaf-blotch has been found to attack both the cucumber and melon. The fungus has been named *Cercospora melonis*, and it has spread with such remarkable rapidity that at the present moment it is one of the most destructive parasites with which the cultivator of cucumbers and melons has to contend.

The foliage is the first part attacked. At a later stage the fruit often also suffers. The first indication of the presence of the disease is the appearance of a few small, scattered, pale green spots on the upper surface of the leaf. The spots gradually increase in size and also in number, and often run together, gradually passing through grey to a brownish colour. If at this stage the upper surface of the diseased spot be examined with a pocket lens, it will be seen to be covered with delicate upright brown threads, each bearing a conidium at its tip. This represents the fruiting portion of the fungus, the mycelium or hypæ being buried in the substance of the leaf. The minute conidia or reproductive bodies are carried from diseased to healthy leaves by currents

of air, insects, clothing, &c., or by spraying; and if the leaf surface is moist such conidia germinate, and the germ tubes enter the tissues of the leaf directly. Very frequently a leaf becomes quite dry, and crumbles to the ground within twenty-four hours of the first infection. Such dead fallen leaves are much more responsible for the rapid spread of the epidemic than are the conidia which pass directly from one leaf to another. When the dry fragments of a diseased leaf fall on damp earth, the mycelium present in the tissues quickly commences growth and forms an exceedingly delicate cobweb-like mycelium, which runs on the surface of the soil and produces myriads of very minute conidia, which are dispersed by currents of air, and infect the leaves in a manner similar to that of the larger conidia borne on the leaves.

THE MYCELIUM in the soil originating from diseased fallen leaves continues to extend and produces conidia so long as the requisite conditions as to moisture and temperature are present. When these conditions fail the mycelium passes into a resting condition, but readily assumes renewed activity when stimulated by returning moisture and heat. By this means the fungus survives from one season to another in the soil, and the disease is almost certain to recur year after year in a house that is once infected unless the soil is thoroughly sterilized. It is important to remember that the disease under consideration can only assume the proportions of a destructive epidemic when attacking plants grown under glass, and when a high temperature and an excess of moisture are present. Such conditions, accompanied by a deficiency of light, result in the production of "soft" foliage, and it is only such soft foliage that the fungus can attack.

PREVENTIVE MEASURES.—If the foliage is fairly hard the disease cannot assume the dimensions of an epidemic, and even if it appears it can be kept well in hand by spraying. To accomplish this end a fair supply of air should be admitted, so that the atmosphere is not constantly saturated with moisture. It is wise to spray in anticipation of the disease, using a solution of potassium sulphide (liver of sulphur), 2 oz. to 3 gallons of water, adding 2 oz. of soft soap. It is important that the under surfaces of the leaves be thoroughly wetted with the solution. If the disease be present the soil should also be drenched with it. Diseased leaves should be gathered and burned before they decay and fall to the ground. After a diseased crop has been removed, the soil should be thoroughly drenched with a solution of "Jeyes' Fluid," in the proportion of one ounce to a gallon of water.

SPRAYING CROPS

By WILLIAM CRUMP

Growing plants are liable to serious injury from two classes of organisms, viz. noxious insects and parasitic fungi. Where either of these is allowed to flourish it is impossible to practise successful fruit cultivation, therefore we must deal promptly and thoroughly with these enemies. Generally speaking, this can best be accomplished by spraying with an insecticide, the thorough application

of which will be better understood if one has a good knowledge of the habits and methods of development of the various insects or fungoid pests. Nearly all these organisms are weaker or easier to destroy at some particular period of their existence than at any other. We sometimes hear of Nature preserving her own balance when not interfered with by man, by certain injurious insects being destroyed by others not injurious to plants. Doubtless this does occur to a certain extent, but the real difficulty lies in recognising and preserving the insect friends, and furthermore in being able to secure and rely upon them in sufficient numbers at the right moment to cope with the hordes of rapidly multiplying enemies.

HOW INSECTS FEED.—Insects take their food in two ways : some bite and others suck ; those which bite take, piece by piece, the tissues of leaf, stem, or fruit of their host plant. Because of this they may be destroyed by placing particles of poison upon the surface of the leaves, *i.e.* by spraying. A large proportion of the injurious insects feed in this way, but there is also an important class which have a proboscis that they push into the cells of the plant and suck out the sap juices. Insects of this kind cannot be destroyed by coating their food plant with particles of poison, for such particles will not enter their alimentary system, consequently one must use against them an insecticide that kills by contact.

INSECTICIDES.—There are several such insecticides in common use, the most important and safe being caustic alkali insect powder or paraffin emulsion. Insecticides used in spraying may be broadly divided into two classes, *viz.* : First, internal poisons, or those which take effect by being eaten with the ordinary food of the insect ; and second, external irritants, or those which act from the outside either by closing the breathing pores or causing death by intense irritation of the skin. Substances used to destroy insects are called insecticides ; those used to destroy fungi, fungicides. The most important matter connected with these insect pests and spraying is to attack them on the first signs of their presence, or, better still, to act on the old adage, "prevention is better than cure," for once they are allowed to get the upper hand they are very difficult to dislodge, especially those which roll themselves in the leaves, where the insecticide cannot penetrate. The same remark applies to all the aphides, which breed with such startling rapidity. We have found that an insecticide, even when strong enough to kill every insect, at the same time is harmless to the eggs, enclosed in their shining, hard, shell cases. Hence we have to repeat the sprayings at daily intervals so as to endeavour to wet every tiny insect as soon as it emerges from the egg, and thus prevent their reaching the adult stage for further egg laying. A fruit and hop grower in Worcestershire has recently imported a large quantity of Californian ladybirds, as an experiment to see whether they will devour aphides in the same good way as they do in their native country. We shall watch this interesting and enterprising experiment with much interest. The worst feature is that spraying has an injurious effect upon the ladybirds as well as the aphides.

The Board of Agriculture supplies gratis special pamphlets upon the most common and injurious insect pests, and they contain much valuable informa-

tion; and if some pressure could be put upon dilatory owners and growers so as to compel universal spraying, we should all be gainers and have far less occasion to cope with insect pests, especially with such winged species as the pear midge (*Diplosis pyrivora*), which deposits its eggs in the opening buds of the pear flowers secure and safe from any insecticide. We have taken care to pick and burn every little infested pear each season, which is the only remedy; but the case is hopeless so long as our dilatory neighbours allow them to propagate on their neglected trees and to spread. Thus are formed breeding grounds from which other orchards are infested. It is very necessary, therefore, that all owners of such orchards should be compelled in some way to stop the damage that is caused by the various insect pests they encourage.

CLEANSING OLD ORCHARDS.—For this purpose there is nothing so effective and so economical as caustic alkali (a burning wash) syringed through the trees with an ordinary garden engine or hop-washing machine. The wash is made by dissolving 1 lb. of commercial caustic soda in water, then 1 lb. of crude potash in water. When both have been dissolved, mix the two well together, then add $\frac{3}{4}$ lb. of common agricultural treacle, stir well and make up with soft water to make ten gallons. The wash has a burning effect upon the hands and clothes, and care must be exercised in distributing it. The best time to do it is about the middle of February, and it will rid the trees of American blight, the codlin maggot, apple blossom weevil, thrips, red spider, the apple sucker, scale, earwigs, and many other insects that are killed by contact. If the branches and stems of the trees are well wetted, the wash will clear all lichen and mossy growths, and make the bark bright and shining. If a Vermorel nozzle is used a long rod or brass tube can be added and so enable the worker to direct the spray well up among the branches and away from himself.

Paraffin emulsion is prepared as follows:—Dissolve 2 lbs. of soft soap in one gallon of boiling water, add two gallons of paraffin, mix the two well together until quite a creamy emulsion is produced; one part of this concentrated emulsion, mixed with 40 to 50 parts of water, is then ready for use through the spraying machine or garden engine. The Vermorel Knapsack pump is a most handy machine for garden purposes. The old-fashioned remedy for aphides is still largely used, as it can be made in quantity on the premises, and cheaply. Boil 10 lbs. quassia chips, 7 lbs. soft soap, with 100 gallons of water; syringe freely with this solution.

POISONS.—The above each kill by contact, but when we come to the poisons, which we have to use to destroy the leaf-eating insects, far greater care and skill must be exercised. In some seasons we have virulent attacks from the winter moth, the mottled umber, the lackey moth, the ermine moth, and others, and if they are not destroyed by the early application of one of the poisonous liquids all the foliage will quickly be devoured. The best insecticide to use against this class of insects is called Paris green. It is a chemical compound of arsenic and copper. It is almost insoluble in water, but there is often a small percentage soluble, and to prevent the injury this may do to the foliage it is advisable to add a little lime water (made by slaking caustic lime in water) to the spraying mixture. Paris green is a heavy powder, and the difficulty is to

keep it in suspension, for unless the liquid is constantly stirred the powder settles to the bottom of the vessel, consequently the mixture becomes of unequal strength, and is liable to injure the foliage. An improved (more finely ground) Paris green is now offered, and is a much superior and safer article. We have also used London purple, a similar compound to the above, colour excepted, and we have tried many of the newer forms of insecticides, but they are much too expensive for large growers. On the other hand, they are generally useful and effective. For the amateur and small cultivator, especially good and convenient is extract of quassia now cheaply offered by dealers.

As a fungicide and remedy for mildew, we have found nothing better than sulphur in some form, such as sulphide of potassium, or liver of sulphur, but the Bordeaux mixture is excellent for spraying potatoes, or other ground crops. It is hoped that at least some of the restrictions imposed upon the sale of these widely used poisonous compounds will shortly be removed, so as to enable fruit-growers to combat successfully against destructive insects and diseases.

CHAPTER XXVII

CONSTRUCTION OF FRUIT HOUSES

By A. DONALD MACKENZIE

THE VINERY.—In fixing upon the shape, as well as the site of a vinery, local circumstances must be taken into consideration, and must decide whether it is made lean-to, semi-span, or full span. If there is an existing wall of sufficient height and of good aspect the lean-to will, of course, be most suitable. Although there is no fixed width for a vinery, it is very desirable that it should be of a good width, that is, it ought not to be under 15 feet, and nearer 20 feet if this can be managed. A very fair size is 18 feet, and with a back wall of say 17 feet, will give a rafter of 22 feet with 4 feet in front.

STABILITY.—In the construction of such a vinery details must, of necessity, be left largely in the builder's hands, but there are certain things which ought to be considered essential. First, the stability of the structure. A 22 feet rafter of the ordinary section, say 7 by 2½ inches, must be supported, or it will sag very badly. This support may be given by upright pillars under each alternate rafter, with a strong angle-iron running the whole length from end to end, supported by the pillars. Another method is by having strong cast-iron brackets at the bottom of each rafter bolted to the front framework, and a similar bracket at the top bolted to the back wall. This latter makes a very substantial roof, and is quite in accordance with sound construction.

VENTILATION.—Another essential matter is the ventilation. No matter what the size or the shape may be, a vinery should have full ventilation top and bottom, with means of controlling the inflow and outflow. Both bottom and top ventilation should extend continuously from end to end. In the front the opening sashes should be hinged at the top to open outwards that the cold air may impinge on the hot pipes. When the sashes are on centre points the cold air gets in at the top and bottom simultaneously, which may injuriously affect the lower portion of the vine, especially when the house is an early one. Similarly the top ventilation should be hinged at the top to open 1 inch or 1 foot, as may be required. This should be done both top and bottom by suitable gearing worked by a wheel or lever, and should be very substantial and not easily put out of order.

TRELLIS.—The wiring of vineries has developed in the direction of the wires being kept further and further away from the glass. Forty years ago the ordinary distance was 10 to 14 inches; later, this was increased to 16 inches; now many of the best gardeners prefer to have the wiring 24 to 30 inches from the glass, the reason given being that the vine leaves are less apt to get scorched

or chilled with the increased distance between the glass and the leaves. The wires themselves should be not more than 10 to 12 inches apart, and must be supported below each rafter by light iron bars.

EARLY VINERY.—If for early forcing, a vinery 18 feet wide would require liberal heating power. There should certainly be not less than about 1 foot of 4-inch pipe to every 25 cubic feet of space. This would give eight rows from end to end, and they would be best placed six rows in front about 2 feet off the front wall and two rows next the passage. In exposed situations a larger allowance of pipe should be made—six rows at the front and four rows next the passage would not be too much. It is the worst economy possible to have too little heating power, as, when the low temperature comes, heavy firing and waste of fuel will take place, and the saving of the capital cost of two rows of 4-inch pipes

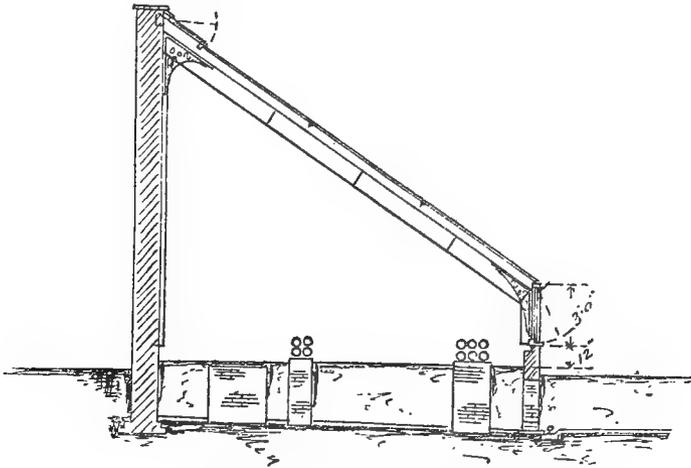


FIG. 1.—EARLY (LEAN-TO) VINERY

(In Section)

is soon swallowed up, not to speak of the trouble and anxiety when there are 20 or 30 degs. of frost.

It need hardly be mentioned that where two or more houses are heated from the same boiler provision must be made for heating every house separately. Fig. 1 is a section of such a vinery as described. The main wall must be supported on pillars and arched over, or, what is better still, the wall between the pillars supported on light iron beams or plates.

THE SEMI-SPAN VINERY, when the aspect is south or nearly south, is considered to be preferable to the lean-to. Especially is this the case with a late house; the morning and evening sun shining through the back roof is supposed to aid the ripening and colouring very considerably. The late Mr. William Thomson of Clovenfords held this view very strongly. The mode of constructing

a semi-span vinery is practically similar to the lean-to already described. Probably even greater care should be exercised in very thoroughly binding the roof so that there should be no outward thrust on the walls, which is the true principle of roof construction. The roof ventilator on a semi-span roof should always be on the south side; on no account, unless where exceptional reasons exist, should the ventilator be on the north side. In dealing with these two types of vinery construction an assumed width is taken and an assumed slope, but it is by no means to be inferred that the very best grapes cannot be grown in houses of a different width and a different slope. There is no fixed rule: the wide house will grow more, but it may not follow, better grapes. In short, a good gardener will grow good grapes in a very poor house. Fig. 2 represents a section of a

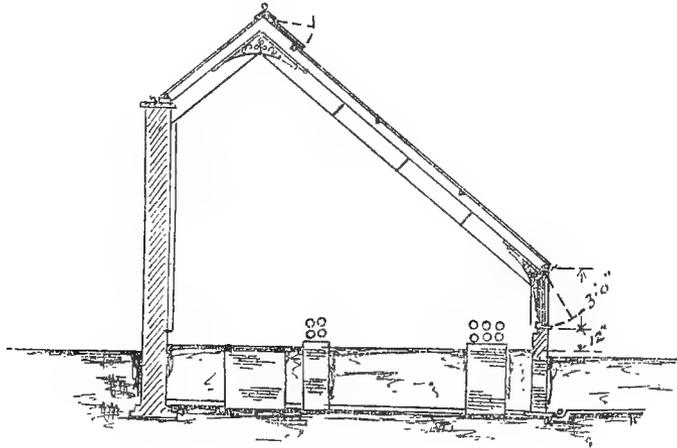


FIG. 2.—SEMI-SPAN VINERY

(In Section)

semi-span house, which, as will be seen, is practically the same in construction as the lean-to.

SPAN-ROOF VINERY.—For market purposes and where very large quantities of grapes are required, or where there are no high walls, the span-roofed form should be adopted, and there must be a radical change in aspect. In the case of the lean-to and semi-span the vinery should face the south with as little east or west aspect as may be practicable, but the span-roofed structure should run north and south as evenly as possible, so that each side may get an equal portion of sunlight and heat. The span-roofed vinery, being as it were two lean-to's, should be very much wider if a large crop is expected. A good width would be 30 feet, equal to two lean-to's at 15 feet, and giving a rafter with not too steep a pitch of about 19 feet. The sides in this case also should be about 4 feet—1 foot of wall above floor level and 3 feet of glasswork framing. There should be ample means of ventilation, an opening

sash extending continuously from end to end each side of the ridge, and, of course, the bottom ventilation, as in the lean-to, each side. A large structure like this should have upright pillars supporting the ridge, as the width is really too much to do without, unless very heavy bracing is adopted, and this is objectionable as causing obstruction to the light. A 30 feet wide vinery, even for late use, should not have less than four rows of 4-inch pipes each side. It must be remembered that, in proportion to its cubic capacity, a span-house is much more difficult to heat

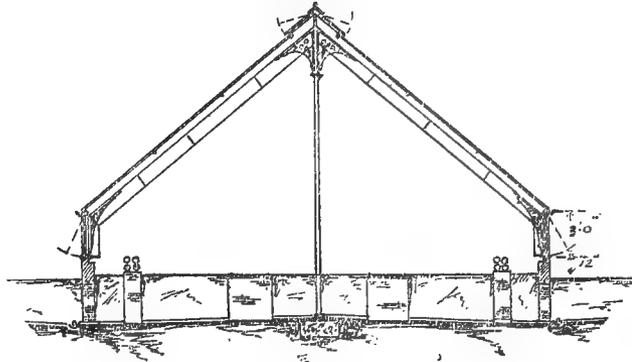


FIG. 3.—SPAN-ROOF VINERY
(In Section)

than a lean-to—there is not the great shelter of the back wall. Fig. 3 is a section of a span vinery.

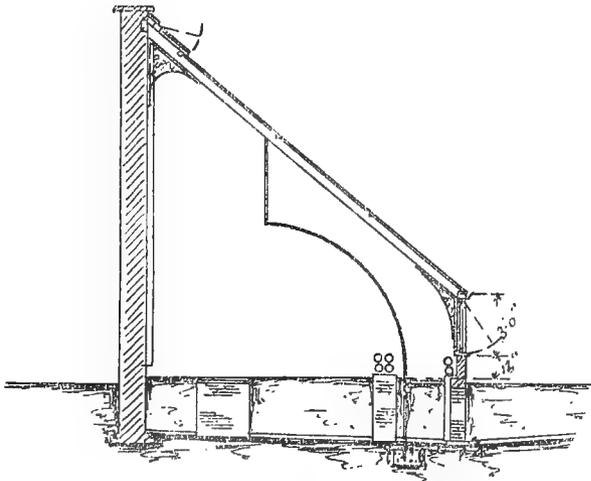


FIG. 4.—LEAN-TO PEACH-HOUSE
(In Section)

PEACH - HOUSE.—In the cultivation of peaches and nectarines under glass, the structures very much resemble the vinery, but generally less width and a steeper pitch are desirable. A fair width for a peach-house is 12 to 15 feet with a pitch of about 40 degs. The mode of construction and ventilating arrangements already described should be applied, but the wire trellising must be quite different. While the back wall of a vinery is of very little use for produc-

ing grapes, the back wall of the peach-house, at least the upper portion of it, is of great importance for the growing of peaches. In order that the full use of this

upper back wall surface may be utilised, the front trellis should only be carried half up the rafter. The front trellis wires should be nearer the glass than the vine trellis, but generally it is best to have a "drum trellis" here with full space between it and the front to allow a free passage. The back wall should be wired

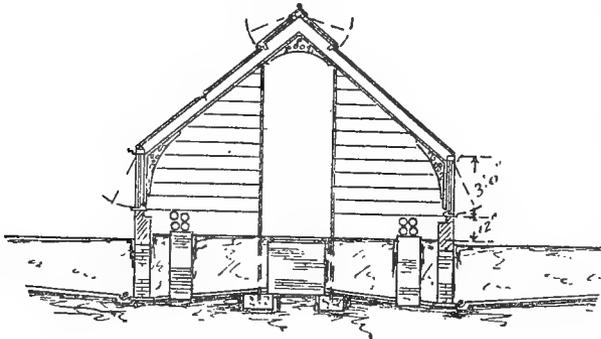


FIG. 5.—SPAN-ROOF PEACH-HOUSE

(In Section)

about 6 inches clear, and the wires here, as well as in front, about 6 inches apart. Fig. 4 is a section of a lean-to peach-house with drum trellis, the width shown being 15 feet, and six rows of 4-inch pipes.

When it is necessary to adopt the semi-span form for a peach-house, the north rafter should be short in order not to limit the wall space for the back trees.

The span-roofed form of peach-house is frequently adopted, the aspect being, of course, north and south, with the lower section only wired on each side, or, better still, a curved trellis. Very good results have been obtained by having in a span peach-house screen cross trellising—that is, below each rafter, say 5 or 6 feet apart, a trellis from the front to the path, as illustrated in Fig. 5.

MELON, CUCUMBER, AND TOMATO HOUSES.—Melon and cucumber houses are practically on the lines of the ordinary forcing-house, and may be anything from 10 to 15 feet wide; 13 feet may be taken as a fair average, giving 3 feet for the passage, 4 feet for the bed each side, and allowing 1 foot for the side framework. Fig. 6 shows a section of this house, with side walls 3 feet high and $2\frac{1}{2}$ feet of glasswork, giving $5\frac{1}{2}$ feet to the eaves. The roof

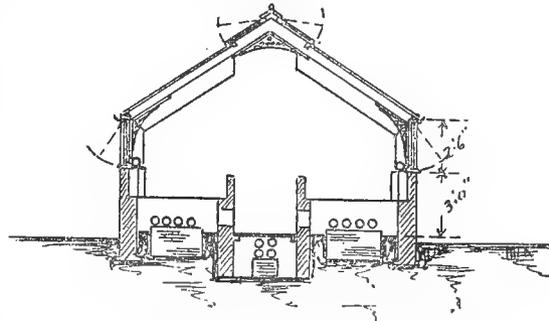


FIG. 6.—MELON OR CUCUMBER HOUSE

(In Section)

should have a pitch of about 34 degs. The bed walls should be $2\frac{1}{2}$ feet above the floor level, and go down about 2 feet below so as to form a channel for pipes, which may be partly leaders for supplying a section of the house or may be altogether for surface heat.

The remarks made in connection with the heating of vineries apply with equal force here. There should be no attempt made to economise at the expense of the heating surface. A 13-foot melon-house should have four rows of pipes below each bed for bottom heat, four rows below the pathway, which should be of grating, and one row each side, for top heat, beneath the ventilator. There should also be ventilators in the bed walls and openings through the bed itself close to the front, to allow the heated air below the bed to escape. All the various circulations of pipes should have controlling valves for regulating or cutting off the heat when required. The wire trellis on each side need not extend beyond the doorpost, and should be about 10 or 12 inches from the glass. Such a house as has just been described is excellently suited for the growing of melons, cucumbers, tomatoes, and for general forcing purposes.

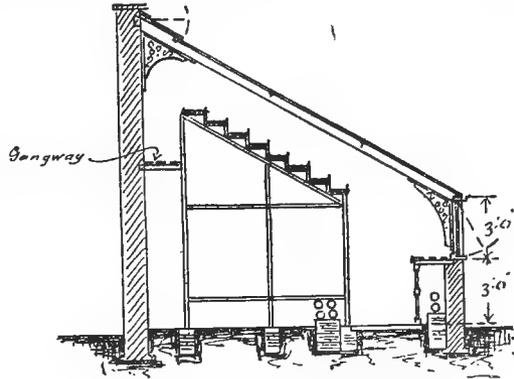


FIG. 7.—LEAN-TO STRAWBERRY HOUSE
(In Section)

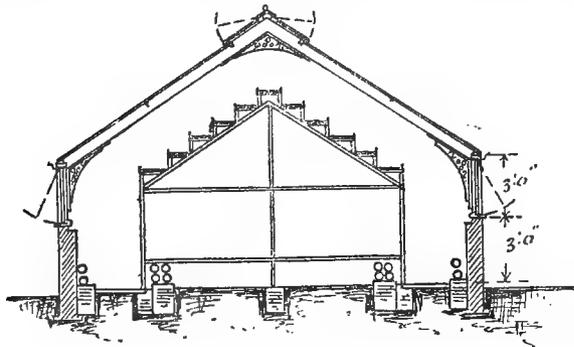


FIG. 8.—SPAN-ROOF STRAWBERRY HOUSE
(In Section)

For EARLY STRAWBERRIES either the lean-to or span shape will do equally well, the main requirements being shelves as close to the glass as may be practicable, and easy facilities for watering. Figs. 7 and 8 are sections of lean-to and span strawberry-houses.

PINEAPPLE STOVE.— For some time the cultivation of the pineapple under glass has gone down very much, probably owing to the introduction of the cheap foreign article, and it is only in a comparatively limited number of gardens that the cost of fuel necessary to maintain the high temperature required is considered well repaid by the possession of the finer home-grown fruits. The maintenance of a temperature of about 70 degs., with perhaps 20 degs. of frost outside, requires great heating power, and a construction with

as limited a cubic capacity as may be practicable. For this reason the lean-to form of pine stove with thick walls, or sunk into the ground, is very suitable. Fig. 9 is a section of such a house, which should face due south. It should not be less than 15 feet wide with a passage all round, and a 9-foot bed in the middle. The height should only be sufficient to allow a man to walk along the passages. Some growers prefer the span form, especially for late and summer

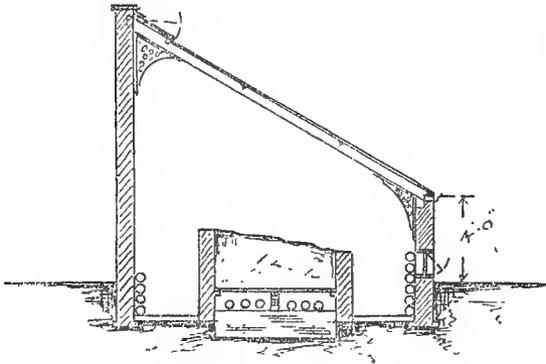


FIG. 9.—PINEAPPLE STOVE
(In Section)

fruiting pines. Such a house, about 15 feet wide, should be kept as low and as flat as possible, with a passage all round. The bed must be raised as near the glass as is practicable, and there must be plenty of heating power.

The heating is shown here with six rows of pipes in the bottom of the bed, six rows on edge at the front, and four rows on edge at the back. There is no need for any glass framework at the front, the necessary ventilation may be got by box ventilators in the wall im-

mediately behind the front pipes, and the top ventilation in the manner already described, or by box ventilators in the back wall similar to those in the front. It is advisable that with such an arrangement of pipes, separate valves should control the bottom heat and the surface pipes.

TOMATO-HOUSES.—The demand for tomatoes for a number of years has been very great, and is likely to continue. It is one of those easily grown fruits which will thrive almost anywhere with a little protection from the cold. Where large quantities are required, other things being favourable, a span-roofed house answers admirably, running north and south in the usual manner. A convenient width is 15 feet, although houses 20 feet or even wider are often built.

The vinery construction will apply to the tomato-house, except that the latter must have higher sides and probably less heating power. The plants may be grown in pots on the floor or in beds, and trained up the front and sides on a trellis.

If the tomato-house is made wide for large quantities, a much simpler arrangement may be adopted without beds. The plants may be grown in pots or in the open soil, suitably prepared.

ORCHARD-HOUSE.—An orchard-house is simply as large and commodious a glass structure as is practicable with two necessary arrangements—first, means of ample ventilation; second, means of thorough heating well distributed. An orchard-house to be worth the trouble should not be less than

20 feet in width, better still, 25 or 30 feet. There is no practical difficulty in constructing such a house, nor in heating it, but the ventilation is not quite so simple. It is easy enough ventilating as for a vinery, but this is not enough for an orchard-house. The ideal ventilation would be the power to remove the roof and sides altogether in warm weather, allowing the warm wind to play through without let or hindrance. As this is quite impossible the nearest approach to it is to have all the sashes in the front to slide, which is frequently done. The roof also might be arranged in sashes to slide horizontally—not in the old way of sliding down from ridge to eaves, but from end to end. If this were done one-half of the area could be exposed when desirable, and though it would be somewhat expensive in first cost, the ultimate results would be well worth it. Fig. 10 represents such an erection, 25 feet wide, with the sashes open. The arrangement inside as to whether there

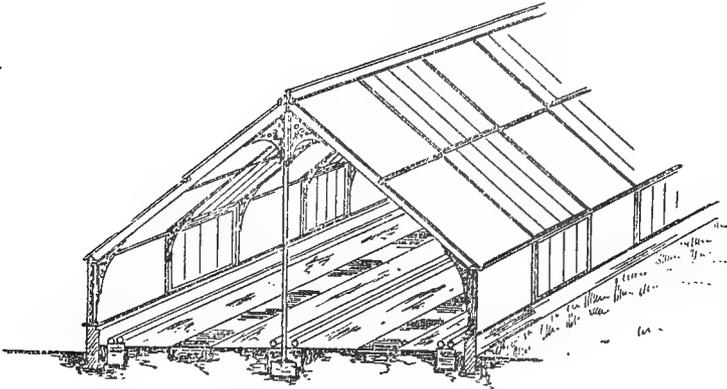


FIG. 10.—ORCHARD HOUSE

should be wire trellis like a peach-house, or whether the fruit trees should be in pots, tubs, or planted in the border must be left to the individual judgment of the gardener in charge.

BOILERS AND HEATING APPARATUS.—Coming to deal generally with boilers and boiler-setting, chimneys, &c., it is undesirable to be dogmatic. There are few subjects upon which there has been more controversy than hot-water boilers, and it is still going on. One great difference between garden hot-water boilers and steam boilers must not be overlooked, and it is this. With a steam boiler what is wanted is quick, clear combustion, careful and frequent stoking, or, as the case may be, stoking by mechanical means. It is the opposite with a hot-water furnace. We need a furnace that requires little attention, and will go for many hours without assistance; in short, what is best is a slow smouldering fire which will keep the heat up from 8 P.M. to 8 A.M. For this reason a garden furnace should be of ample capacity, and on the face of it, one would think, of horizontal rather than of vertical form.

The common saddle is a well-known form of boiler. There are many

modifications of it more or less of an improvement. There has been a keen controversy for some time regarding the best steam boiler for marine and naval purposes, the old cylindrical or Scotch boiler being largely replaced by some form of water-tube boiler. In a recent trial in two ships of war, one having the cylindrical, the other the Belleville water-tube boiler, it was found that whatever advantage the latter might have for use in a fighting machine, neither in economy nor efficiency was there much, if any, advantage over the old type. On land the Cornish and Lancashire boilers still hold their own as economical steam generators.

It is thus evident that the horizontal boiler and furnace are still in favour.

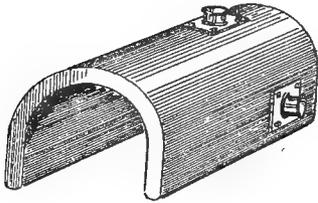


FIG. 11.—ORDINARY PLAIN SADDLE BOILER

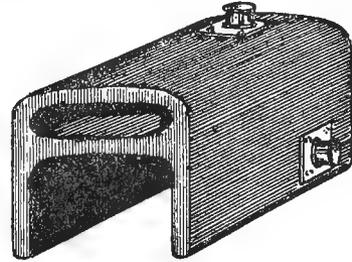


FIG. 12.—THE TERMINAL SADDLE BOILER

The hot-water saddle boiler may be said to represent the upper portion of the cylindrical boiler, and made of ample size is most suitable for horticultural work.

Fig. 11 shows the ordinary plain saddle, very suitable, when favourably placed, for 600 or 800 feet of 4 inch pipes.

When the apparatus is from 800 to 2000 feet the terminal saddle, Fig. 12, should be used, because it occupies less space than the length of the plain saddle would require.

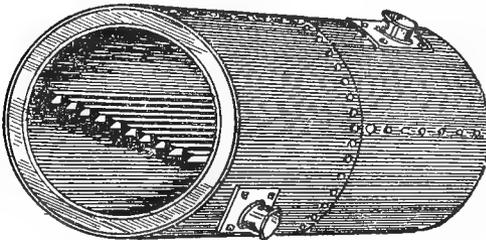


FIG. 13.—STEEL RIVETED MODIFIED CORNISH BOILER

For still larger apparatus up to 10,000 or 15,000 feet of 4-inch pipes a steel riveted modified Cornish boiler is certainly the best. Fig. 13 shows such a boiler. The writer has used one of this shape, 21 feet long, 4½ feet diameter, with water bars, to heat 15,000 feet of 4-inch pipes,

with the very best results. Of course where valuable plants are at stake it is not desirable to depend upon one boiler; there should be a duplicate in case of a breakdown.

It is unnecessary to refer to the army of small independent upright boilers of all "shapes and sizes" which are on the market. These may do their

work well enough, but the writer knows of no advantage they have over the horizontal form for horticultural work, while open to several disadvantages, one of these being the necessity for a deeper stokehole. It may be proper at this stage to point out that one most essential point for the success of a hot-water apparatus is to have the boiler well below its work. A boiler which might very well heat 1000 feet of pipes with 10 feet of head should not be put to more than 750 feet with 5 feet. Many grave errors and great trouble might be avoided by giving due weight to this fundamental principle, and while not dogmatising in any way I would urge that the boiler should be sufficiently low down to give at least one-half inch of rise on every 10 feet of piping, and as much more as might be reasonably practicable.

It need hardly be said that while it is very desirable to choose a good type of boiler, it is also essential that ample size should be allowed for. An incident which came within the writer's experience will illustrate this. In the winter of 1879, which was very severe in Scotland, a saddle-boiler in the well-known gardens of Sir Charles Tennant, The Glen, gave way and a new one had to be put in. During December this boiler consumed $3\frac{3}{4}$ tons of coal per week, and a man had to sit up half the night putting on fuel. A new boiler of the same type was put in, but more than double the size, which took only 2 tons per week and required no attention from 9 P.M. till 7 A.M. next morning. During January as well as December the weather was very severe, from 20 to 30 degs. of frost being registered nearly every night.

SETTING THE BOILER.—The setting and building in of a boiler is a most important matter, but this need not be enlarged upon further than to give these instructions:—*First*, to have a reasonably high chimney, and, if possible, to have it as high as any surrounding buildings or trees; *second*, to have the chimney as near the boiler as possible; and *third*, to have the flues large and every crevice accessible for easy cleaning. No such flue should, even for a very moderate-sized, indeed for any, boiler, be less in area than 90 inches— 10×9 inches—and for large boilers correspondingly larger. If there is a necessity for a long horizontal flue it should be made 2 or $2\frac{1}{2}$ feet square, or even larger still if very long, in order to reduce the friction to a minimum. The writer has known a flue from a 6-foot terminal boiler, 15×15 inches, 60 yards long, to be an absolute failure, but when enlarged to 36×30 inches give a first-rate draught. Such a flue should be made of good brick and be as nearly watertight as possible. It is desirable, especially with long boilers, that the flow socket should be at one end, and in setting the boiler that the end upon which the flow socket is fixed should be at least one inch higher than the other, to make sure that no air can be locked up inside the boiler.

WATER BARS.—Reference has been made to water bars. These are undoubtedly of great advantage where they can be applied, but the water must be soft. Where there is anything more than eight or nine grains of hardness to the gallon there should be no attempt to use water bars. The best way of all is to feed the heating apparatus with rain water, then all danger from incrustation is avoided. When hard water is used for heating purposes provision must be made for clearing out the boiler and pipes adjoining at frequent

intervals, otherwise the whole may get choked with lime. The water pumped up from the chalk in the eastern and southern English counties should be carefully guarded against.

With reference to the working of the hot-water heating apparatus, where there are several circulations at various levels there is often great difficulty in preventing blocking or short circuiting, and while a good deal can be done to avoid this trouble by carefully fixing the pipes, it is necessary that the valves regulating each circulation should be manipulated in a careful and intelligent manner. Those circulations nearest the boiler or on a higher level should be carefully watched to ascertain the amount of restriction necessary to give the longer and more sluggish circulations an equal chance. It is quite impossible to formulate any rule which would apply in all circumstances, and the attendant should be encouraged to study the apparatus from day to day until, by experience, he learns what degree of restriction each valve must be set to.



PINEAPPLE CULTURE IN SOUTHERN FLORIDA.



*COCOANUT PALMS ON THE SHORES OF LAKE WORTH,
FLORIDA.*

CHAPTER XXVIII

FRUIT CULTURE IN AMERICA

By H. E. VANDEMAN (*Ex-Pomologist, U.S.A. Department of Agriculture*)

THE aboriginal inhabitants of North America paid only slight attention to the culture of fruits. The Aztecs and other tribes of the arid south-western country practised irrigation, perhaps for thousands of years before what we call civilisation reached them, and probably cultivated a few fruits along with the cereals and vegetables which they grew. When the Spaniards first established colonies on the coast of Florida, they brought with them seeds of the orange, lemon, lime, and perhaps other fruits; and the natives, seeing that the trees produced good fruit and were of easy culture, planted them in their rude way. The Catholic Mission Fathers introduced the peach and some other fruits at Santa Fe, New Mexico, and other places along the southern border of what is now the United States; and in California they planted the orange, lemon, olive, apricot, date palm, the European grape, and a few of the more common fruits.

The English settlers at Jamestown, Virginia, in 1620, perhaps first planted the apple and pear. They also planted the grape and some other European fruits. The colony of William Penn at Philadelphia did the same. The Pilgrim Fathers of New England brought over the apple and other fruits that were the foundation of many of the earliest orchards in that region. The French planted the apple, pear, peach, and the grape in all their settlements in the valley of the Mississippi and along the Great Lakes of the north.

Thus we see that American fruit culture dates from the earliest settlements that were made on our shores, if not from time out of mind by the aborigines. Those who came to establish homes in the New World brought with them the fruits that they knew and prized in the old country beyond the seas. In addition to the fruits just mentioned there are many native fruits, and nuts of great value that have been brought under cultivation, and mostly within the last century. Nearly all our berries, with which we are especially well supplied, have principally been developed from those growing wild. The same is partly true of the grape.

For the first two centuries after America was settled by the white race there was very little progress in fruit culture, and for several reasons. The means of transportation, both at home and to foreign countries, was slow and expensive. The principal uses for fruits then were the making of wine and cider. Refrigeration, evaporation, and canning were practically unknown. The varieties were mostly inferior, and some of the best in quality were unadapted

to the climate. Tools and methods of culture were crude. But within the last fifty years there has been more improvement in those respects ten times over than in all the time before. The most fanciful dreams of the fruit growers of the early part of the last century have been more than realised. This industry in America has fully kept pace with the march of progress in the sciences and arts by the improvement of varieties, of methods of culture, and extension of planting. The Civil War, which lasted from 1861 to 1865, was the dividing line between the two great eras of our horticultural progress. Before that time the culture of fruits was chiefly experimental. Many of the foreign varieties had not proved satisfactory, and they were under trial, or being gradually abandoned. There were many noble-minded men who gave their best endeavours to the origination of new varieties and the testing of others. Among them were C. M. Hovey and Marshall P. Wilder of Massachusetts; Charles Downing and Patrick Barry of New York; Dr. John A. Warder, George W. Campbell, Jared P. Kirtland of Ohio, and many more.

During the first fifty years of the last century the eastern half of the great Mississippi Valley, which lies between the Alleghany Mountains and the Mississippi River, was being settled. The pioneers carried the seeds, cuttings, and plants of the best fruits from their eastern homes across the Appalachian chain of mountains, and planted them in the virgin soil of the territory then called "The West." It was not long before a greater interest was manifest in fruit-growing by reason of the larger crops and finer specimens grown there than had ever been seen in the older parts of the country. The first commercial orchards of considerable size, of the apple, pear, and peach with a very few exceptions, were planted then and there. The Southern States had not yet awakened to their possibilities in fruit culture, for under slave labour scarcely any other crops than cotton, tobacco, and sugar were produced. The Rocky Mountains and Pacific States were mere territories covered by roving bands of Indians and a few trappers, miners, and stockmen, with here and there some trees or vines planted around the pioneers' cabins.

After the Civil War there was a great expansion of our industries and population. Many of the Federal soldiers, who had seen the natural advantages of the Southern States, purchased land, and began to improve the country they had helped to devastate. They planted orchards, vineyards, and berry fields on the old cotton and tobacco plantations. A large portion of Florida was turned into a fruit garden. The building of the Transcontinental railways solved the question of the settlement of the Pacific Slope and the mythical American desert that was supposed to lie in that direction. The great prairies were dotted with farms and orchards. The dry plains and tablelands of the Rocky Mountain regions, sparsely covered with brush, cacti, and stunted grass, being naturally fertile, were irrigated and made to produce the best fruits in abundance. The giant forests of Oregon and Washington were invaded by lumbermen and home-seekers, and they have been partly replaced by orchards and berry fields that now yield some of the largest and best fruits grown in America. The fruits of California are known almost all over the globe for their abundance and excellence. In its early days California was thought to be suitable only

for cattle ranches and mining operations, yet it has developed into the most interesting fruit-growing region in North America, if not in the world. The diversity of its climate and soil is such that almost every kind of fruit can be grown somewhere within the limits of the State, from the apple which flourishes in the mountain sections, to the mango and other tropical fruits that succeed in the sheltered valleys along the southern coast.

THE APPLE

Of all the fruits in America there is none that equals the apple in excellence, popularity, and profit. It was first brought here by the English pioneers who settled on Roanoke Island, North Carolina, and at Jamestown, Virginia, and a little later, by the Pilgrim Fathers, who founded Plymouth and other colonies on the New England coast. It is perhaps grown here with greater success than anywhere else in the world, for it attains its highest excellence with us according to the verdict of the jurors at the World's Exposition, where products of orchards from all countries have been shown. Only a few of the Old-World varieties are considered of much value; not that they do not flourish here, but having taken them as a basis, seedlings have been grown which in many cases surpass them in size, colour, and flavour. Each year adds new varieties to the list, and most of them are chance seedlings that have come up in fence corners and other out-of-the-way places, in old seedling orchards, or in nursery rows. The choicest and most popular sorts grown in our orchards to-day have originated in this way. There are now nearly five thousand named varieties of the apple mentioned in books on Pomology, including those introduced from abroad, but only about two hundred are commonly grown in our orchards. They range in season from early summer to the next May. The popular commercial list comprises less than fifty varieties.

APPLE ORCHARDS.—Almost every farm in North America has an apple orchard of sufficient size to supply the home, except in some parts of Canada, a few of the most northern States of the Republic, and in the extreme south, where it is too warm. Many of these small orchards furnish a surplus for sale, and sometimes the few acres of apple trees yield more clear money than the crops on all the rest of the farm. From the early settlement of the country to about fifty years ago, apples were cultivated in America mainly for cider making, because that was the prevailing use for this fruit in Europe, whence our forefathers came. But cider is now rarely made even by those who have plenty of apples. We have developed into a race of fruit eaters. Commercial apple orcharding has attained gigantic proportions. It began fully one hundred years ago, stimulated by the trade with England, which sprang up about that time, through the sale of a variety called Newtown, or more lately, Albemarle Pippin. One orchard of 20,000 trees of this variety was planted early in the last century in the Hudson River Valley, in New York, from which apples were sold in London as high as £4 per barrel, wholesale, for a short time. This orchard finally fell into decay, and it was not until after our Civil War, or about 1865, that apple-planting again began to develop vigorously in a practical way.

The broad and fertile prairies of the Central States and the valleys and mountain plateaus of the Rocky Mountain regions, afforded ample opportunities for growing apples on a large scale. It is not uncommon now to see an apple orchard of fifty to a hundred acres belonging to a single person. There are others, belonging to orchard companies, of more than two thousand acres in extent.

METHODS OF CULTURE.—The methods of apple culture, and of all other branches of fruit culture to-day are very much in advance of those of a few years ago. Horse power has largely taken the place of manual labour. Even the plough has been laid aside in many cases for other improved tools. There are harrows and horse-hoes of various kinds that stir and pulverise the ground over a wide space. The old plan of leaving the apple orchard in grass, thus making a meadow or pasture of it, is found to be a bad one. The trees grow so much better, and the fruit is so much larger and finer, that many of those who have had their orchards in grass have ploughed them up, and are giving the ground good tillage, with most favourable results. Although most of the large apple orchards are in the States west of the Mississippi River, there are some of considerable size along the Appalachian Mountain chain, which runs north and south through the eastern tier of States. The land in the latter region is mostly hilly, and some of it mountainous, but the soil and climate are especially adapted to apple culture. Western New York is also a famous district for apple culture.

DWARF APPLE TREES are rarely grown in America, except in a few small fruit gardens, nor are fruit trees of any kind trained on walls or as espaliers. We use the open orchard style. Many trees of the older apple orchards were trained with trunks from 6 to 8 feet high that ploughs and waggons might be driven beneath them, but this is rarely seen now. The trees are headed about $2\frac{1}{2}$ feet from the ground and induced to make abundant lateral branches. The trunks are thus shaded from the direct rays of the sun, which in some districts prove injurious to apple trees; danger from wind is less than if the trees were tall, and they are much more convenient for pruning, spraying, and gathering the fruit. Another marked advance in apple culture is the system of close planting. Instead of trees 30 to 50 feet apart, they are set about half that distance, with the ultimate intention of cutting out about half or more of the trees when they become crowded, thus giving abundant room to those that are left. An improvement upon this plan is, instead of using all of one variety, to plant such as will come into bearing early for the temporary trees, and for the permanent trees such as come into bearing later, and will live to an old age. This is the approved plan now adopted by our commercial apple orchardists. It is, fortunately, true that there are varieties of good flavour and with other points of excellence that suit the two purposes. The temporary ones will begin to bear in from four to six years after planting, and need not be dug out until they are ten to twenty years old, while the permanent trees will remain profitable until thirty to fifty years old or more.

VARIETIES.—As might be expected, the wide variation in climate and soil make corresponding differences in the behaviour of varieties of apples. Some



*FIELD OF PINEAPPLES AT PALM BEACH, ON THE SHORES OF LAKE WORTH,
FLORIDA.*



PRUNE DRYING IN CALIFORNIA. PRUNE ORCHARDS ARE ON THE LOWER HILLS.

that are very popular in one district are almost worthless in another. In the Central and Western States all sorts begin to bear earlier than in the east, and die sooner. In the northern part of the Mississippi Valley the climate is so cold in winter that our ordinary varieties will not succeed, and to meet these conditions hundreds of Russian ones have been introduced; but they have proved to be of such poor quality, with few exceptions, that seedlings have been originated, some of which already combine hardiness of tree with good quality of fruit. Through these efforts it is expected that apple culture will become a success almost to the southern line of Manitoba. The list of popular varieties is so large that it is difficult to decide which to omit in mentioning those that are most esteemed. There are two classes, one for family use, which is properly composed of such varieties as are of high quality, regardless of their beauty, productiveness, or other points that make them suitable for the commercial orchardists; and those of a strictly commercial character, regardless of their finer qualities. In some of the varieties we have both requisites combined, for some of the very best of those for home use are equally good for market purposes. All things considered, perhaps Baldwin and Ben Davis are the two leading commercial apples of America, but neither of them is of high quality. York Imperial, Winesap, Jonathan, Missouri, Gano, Rhode Island Greening, and Northern Spy are also very popular. Grimes is the very best of the dessert apples, and Esopus Spitzenburg, Yellow Newtown, Roxbury, Fameuse, and Hubbardston are all varieties of great excellence. All of those so far named are winter apples, and yet not one of them is of foreign origin. There are summer and autumn varieties in abundance and of good quality. Of the former are Early Harvest, Red June, Summer Rose, Benoni, Early Joe, Garden Royal, and Primate; and of the latter, Jefferis, Maiden's Blush, Fall Wine, Bonum, Fall Pippin, Gravenstein, and Mother. All of these except Gravenstein are of American origin.

THE PEACH

Next to the apple the peach is the most important fruit cultivated in America. It was first grown by the Spaniards in their early settlements on the coast of Florida and Mexico. The native Indians seeing that it was of easy culture carried seeds into the more remote regions and planted them there, thus adding greatly to the distribution of this fruit. From this stock there is to-day a type of the peach, and a very good one too, known as "Indian," to which belong some of our best varieties. The French pioneers also introduced peach culture wherever they located, but it was planted in very few of the early English settlements. Sooner or later this fruit became widely distributed, and was at first used largely for distilling into brandy. For this purpose the common seedlings were good enough, but, as our people under the better enlightenment of modern civilisation gave up the custom of drinking this fiery beverage, it has become practically restricted to the saloons, and the peach crop is put to better uses.

TYPES OF PEACHES.—The choicest seedlings have been selected, given varietal names, and been propagated by budding. Such a thing as an orchard

of seedlings is now almost unknown, except in a few remote districts where modern methods are not practised. The Persian strain is most commonly planted, with some varieties of the Spanish type. However, within about the last twenty-five years two Chinese types have been introduced, which have added materially to the value of the peach in America. One of these Chinese types is the Peen-to, which is from Southern China, and is almost tropical in its character. It is not hardy over the larger part of the peach territory, but will endure the peculiar seasons of the extreme south, especially Northern and Central Florida, where the common ones will not succeed. All the varieties of the Peen-to strain are from one to two months earlier in ripening than the others. The fruit is small and has a peculiar, rather bitter taste, but finds favour in a limited way before the larger and better flavoured varieties ripen. The North China type is of very superior character in several respects. The varieties are mostly large, some of them are the largest of all peaches. They are generally creamy white both in flesh and skin, except for a slight blush. By crossing with others of the Persian type, some of the most valuable varieties we have ever grown have been originated. The Elberta, which is to-day the most popular of all our market peaches, came into existence by an accidental cross of this kind.

DISTRIBUTION.—The territory over which the peach succeeds is quite as extensive as that of the apple, and the two are almost identical, except that the peach is less hardy and cannot be grown so far north as the apple. On the other hand, it extends farther south. The most famous regions for growing peaches are the Chesapeake Peninsula, the mountain slopes of Western Maryland, the plain regions of Georgia, Eastern Texas, the Ozark Plateau, which latter includes parts of Arkansas and Missouri; several favoured regions along the Great Lakes, especially Southern Ontario, Western New York, Northern Ohio and Western Michigan; the warm valleys of the Rocky Mountain regions in Western Colorado, Utah and Idaho, and many parts of California.

PEACH ORCHARDS.—In all these districts, and in a less degree in many others, peach culture is a leading industry. There are orchards of two thousand acres and more belonging to one firm or person, and those of a hundred acres are common. The production is enormous. Railway trains are made up, daily, of loaded peach cars alone at a single station. Most of this fruit is sold in the markets, and consumed in a fresh state or canned by the housewives for winter use. Large quantities are used by the canning factories and gigantic evaporators. In California a considerable portion of the enormous crops is dried in the sun. This product is of the finest quality, because of the large size of the fruit and the absence of rains to damage it while curing. California and Oregon together have shipped over 40,000,000 lbs. of dried peaches in one year, and this amount is soon likely to be exceeded. But it is in the homes of our people that the peach is enjoyed more than elsewhere. Scarcely a farm or country place of any kind is without a small peach orchard, and many village plots have a few trees that furnish a considerable quantity of fruit. It sometimes sells at a shilling per bushel, and from two to four shillings is very common. Whether eaten fresh from the trees, served with cream and

sugar for desert (a dainty dish unknown in Europe), canned, preserved, or dried, the peach is delicious.

CULTURE.—The trees are set about 15 to 20 feet apart, trained with low heads and the land thoroughly tilled; except by those who are too careless to treat them properly. In soils not rich in plant-food, for instance, where it is sandy, it becomes necessary to fertilise. There are various ways of doing this, the most common being, to apply German potash salts, Chilian nitrate of soda, and dissolved phosphate rock; but some growers find ways of saving the expense of the nitrate, by growing leguminous crops between the trees every few years, such as German clover and peas, which gather nitrogen from the air, and when ploughed under, add not only this important plant-food to the soil, but humus as well. Thorough tillage in most soils helps to unlock the natural fertility already there, but the best peach growers find it profitable to apply manures of some kind. The trees are headed about 12 to 24 inches from the ground, and are kept from making long and straggling growth when in wise hands. The branches are cut back quite severely every year, that there may constantly be an abundance of new wood, as it is only on this that the fruit is borne. Early spring is the season when this work is done in the east and north, but in the southern States and on the Pacific slope, where the winters are usually mild, it is done all through the winter season.

THINNING THE FRUIT after it is about one-fourth grown is now a common practice, although only recently adopted, even by the most progressive peach growers. The trees often set so many that they would be broken down and almost ruined or very much weakened. Some unprogressive growers allow this state of things to exist at the present day, but they are gradually coming to see that thinning is profitable from every standpoint. The distance apart for the peaches on the branches is usually about 6 inches, but some of the most advanced growers thin them to 8 and even 10 inches apart. It is the large fruit, containing a large portion of flesh as compared with the stone, that brings most profit to the grower, and satisfaction to the dealer and consumer.

VARIETIES.—The varieties most largely grown are Elberta, Mountain Rose, Early Crawford, Chairs, Fitzgerald, Late Crawford, Oldmixon Free, Salway, and Carman.

The exporting of American peaches has barely begun. A few were sent to England some years ago, but the transportation charges were so great that further attempts have been rare. However, enough has been done to show that it is possible, and it is now being done by the Government in an experimental way, in order to determine the possibilities of the trade under modern methods of refrigeration. A temperature of 32 degs. Fahrenheit seems to give the best results. The shipments to London in 1902 were profitable. It may be that American peaches will yet appear in quantity and at sufficiently low prices for the English public to taste them, if not to eat them freely.

NECTARINES are merely peaches without the usual downy covering. They are grown very rarely in the regions east of the Rocky Mountains, because of the curculio, but on the Pacific side there is no such trouble, and as many are

grown as are desired. Even there, only a few are cultivated, however, because the trade does not call for many.

THE PEAR

Along with the apple from Europe came the pear, with the first settlers. There are seedling trees now standing near Detroit, Michigan, and in healthy bearing condition that were planted by the French missionaries more than two hundred and fifty years ago. While we cannot boast of more than a few such trees we have many that are from fifty to a hundred years old, and bearing abundantly. The first tree of the variety which we call Bartlett, was brought from England to America nearly one hundred years ago, and planted at Dorchester, Massachusetts. It is still in a healthy condition and fruiting. This variety originated in Berkshire, England, where it is called Williams', but when the variety was brought to this country the name was lost, and it was renamed in honour of Enoch Bartlett, who first propagated it and sent out the young scions in America. It is our leading pear to-day, both for home and market use. Most of our varieties came from France and Belgium, but some came from England, Germany, and Russia. There were brought from China, about 1850, seeds of the common pear of that country, which we have named "Sand pear," perhaps because of the gritty and acrid character of the fruit. The trees proved to be very healthy and vigorous, and from a supposed cross between the bloom of one of these trees and a Bartlett standing not far away, about 1870, came a seedling that has been named Kieffer, which has almost revolutionised pear growing in America. The fruit is of only fair quality, and many may think it very poor; but it is large and beautifully coloured when ripe, and the flesh is very firm. It is a great canning pear. But the main points in its favour are the almost perfect freedom of the tree from blight, which is the greatest drawback to pear culture in America, its vigour, and constant and abundant bearing. Kieffer pear trees are to-day planted by the million, and the fruit is in a fair way to capture the market. Poor as it is, the exporters are sending the fruit to England and other foreign markets, and the sales seem to encourage larger shipments. There are many other seedling pears of American origin that are superior in many respects. The Seckel is one of these, and it is the most delicious in flavour of all pears. It is small, but the tree is very hardy and almost proof against blight. While most varieties are accidental seedlings, some of our pomologists have made careful and systematic efforts to produce seedlings by crossing, and have thus originated several varieties of excellence.

PEAR CULTURE is common in every part of the Continent, except Southern Mexico, Alaska, and the northern parts of Minnesota and British Columbia. It is remarkable how well this tree adapts itself to almost every soil and climate in America. While the fruit is not nearly so popular as the apple, yet it is used more or less in almost every family, and is sold in all our markets in some form. Canned and evaporated pears are among the standard supplies of all grocers. California, where all conditions seem to conspire to the success of the

business of growing and curing pears, alone produces many millions of pounds of this product.

DWARF TREES.—Many years ago the planting of dwarf pear trees was quite general, but now there are few who will plant them except in small places. Dwarf trees grow well and bear at an early age, but they do not prove nearly so profitable for commercial growers as standard trees. Where only a few trees are needed, because of very small space in which to grow them, or, if one is anxious to have fruit very soon, the dwarf trees have an advantage; but, for general use, pear trees are much better on the Pear than on the Quince stock. They grow larger, live longer, and are able to bear much more fruit per acre than the dwarfs. Most of the dwarf pear orchards were planted in New York and New Jersey, and in nearly every case Angoulême is the variety used, as it does better as a dwarf than any other. The distance apart at which dwarf pear trees are commonly planted is from 12 to 16 feet, and they are kept headed back by annual prunings. Standards are set from 20 to 30 feet apart, and are not pruned very severely, except in California, where closer planting is followed and the trees are pruned annually and severely.

AMERICAN BLIGHT.—The greatest enemy to pear culture in America is the blight, which often destroys whole orchards, especially in the Eastern States, where the climate is moist. In California and other Far-Western States there is very little of it. A rank growth of the branches and weather that is both warm and wet furnish ideal conditions for its spread. This leads to a system of culture in the east which does not include the stimulation of rank growth. It is a common practice to allow grass to grow in pear orchards, rather than till the ground, but some of the best growers object to this, and practise frequent tillage because of the better fruit obtained. The only known method of keeping the blight from spreading is to cut away the affected branches; it is often very difficult to detect the diseased parts until they are almost dead. Cutting out diseased wood as it appears, like fighting fire, is about the only successful thing to do.

THE PLUM

There are three classes of plums grown in America—the European, Japanese, and American. They are quite distinct botanically and in their characteristics, and each has its special points of value. There are native plums growing in almost every section of the country, from the Arctic regions to the tropics, and the fruit was gathered and eaten by the aborigines from the earliest times and by the early colonists. But in comparison with the cultivated plums of Europe, which are varieties of *Prunus domestica*, they are poor, being very sour and in some cases almost inedible.

EUROPEAN PLUMS.—When the best European varieties were planted in the rich, virgin soil of this new world, the trees grew rapidly and in some cases bore fruit of good quality in abundance. But there soon appeared a dread enemy in the shape of a little beetle that laid eggs in the young plums. They hatched into grubs and caused the plums to sicken and drop off. It had always attacked the native plums and some other fruits, but most of them were able to outgrow

the injury. In some favoured sections this insect did not exist, and such is the case now, and there the choicest varieties are grown in abundance. The most favoured of these regions is the Pacific Slope, for the plum curculio has never been seen west of the continental divide, which is the Rocky Mountain chain.

PRUNE ORCHARDS.—In California, Oregon, Washington, and Idaho prune culture is a leading industry. There are vast areas there devoted very largely to prune orchards, and the size and quality of the fruit, as well as the immense crops grown, are a wonder to all who see them. Last year I had three prunes grown in Oregon that together weighed a pound. One trouble is that the trees break down under the heavy loads of fruit. Hogs are sometimes fattened on them, but they are principally used for curing and selling in a dry state. California alone has produced in one year over 100,000,000 lbs. of dried prunes. In that State the summer and autumn seasons are practically rainless, and drying is done on trays in the open air. In Oregon, Washington, and Idaho it is done in evaporating-houses built for the purpose. By the excellence and great quantity of our home product we have almost shut out foreign prunes, which once were all that we had. Instead, we are now exporting prunes to the English and French markets. Tragedy, Golden, Fellenberg, Sergeant, Sugar, and Agen are the leading varieties used for drying.

In the Central and Eastern States these prunes succeed fairly well, but the ravages of the curculio must be overcome. This is done by shaking the trees and catching the beetles in a sort of inverted umbrella trap. It is, however, very tedious and rather costly. No prunes are dried east of the Rocky Mountains. Among the best sorts, unsuited to drying, are Green Gage, Yellow Egg, Grand Duke, Bradshaw, and Lombard.

JAPANESE PLUMS.—Within the last twenty years many varieties of the Asiatic species, *Prunus triflora*, have been imported from Japan, and many more have originated by planting their seeds. There have been numerous hybrids produced by crossing their flowers with those of the European and American ones. Luther Burbank, of Santa Rosa, California, has been most active in this work, for he has produced thousands of crosses in this way, some of which are already named and well received by practical fruit-growers. The Japanese plums are quite hardy and most abundant bearers. Their fruit is variable in size, but most varieties are large. They are purple, red, yellow, and almost white, but none are blue. The flavour of most of the varieties is sweet and very agreeable. Burbank, Abundance, Ogon, Wickson, Kerr, and Satsuma are some of the best. Strange as it may seem, they are almost proof against the curculio, which makes them very desirable.

AMERICAN PLUMS.—It is only within about the last twenty-five years that our fruit growers gave any attention to the cultivation and improvement of native plums. This was brought about by the need of such sorts as would be proof against the curculio, and at the same time hardy on the prairies of the Upper Mississippi Valley, where the climatic changes are very violent and the temperature is very low in winter. At first the best of the varieties growing wild were brought under cultivation. Some of them proved so good that they are now numbered among the standard plums of orchards and nurseries. The

varieties of *Prunus americana* are the hardiest, and more of them are under cultivation than of any other native species. Wyant, Stoddard, Hawkeye, Ocheeda, and Rockford are among the best. They will succeed where the temperature drops to 45 degs. below zero. There are several other native species that are not very hardy but have choice varieties. But the hybrids between all these species and the foreign sorts, especially the Japanese, are of the greatest interest. Although this work has only fairly begun, the results are already very satisfactory.

CULTURE.—The common distance apart in the orchard for plum trees is about 20 feet. Thorough tillage is the rule, and where the soil is thin manuring is essential. In the great prune orchards of the west very little fertilising is necessary, because of the natural richness of the soil. Orchards of one hundred acres or more of one variety are common there. From a single point, in California and adjacent States, it is possible to see thousands of acres of prune orchards, and all kept scrupulously clean and under a high state of cultivation. There are different opinions about pruning plum trees, as with those of other fruits, but it is the general practice to cut back rather severely for about four years to secure a stocky form and then prune moderately each year after.

THE APRICOT

Of the many fruits that came from Europe to America the apricot has been grown about as long as any, but owing to the ravages of the plum curculio, which has proved a terrible pest to it, it was only occasionally that a tree bore profitably until the settlement of California. There, and in all the region west of the Rocky Mountains, apricots are grown with the greatest ease; indeed one of their chief faults is over-cropping. There are very extensive apricot orchards in the valleys of California and Idaho, and to some extent in Oregon, Washington, Arizona, Utah, and the western part of Colorado. In those regions they are grown principally for drying and canning, although all that are needed for home use are consumed in the fresh state, and many thousands of bushels are annually sent to our eastern markets. California alone has sold over 30,000,000 pounds of dried apricots in one year. In a few districts of the East, especially in New York, the apricot is grown in a commercial way. The trees are planted about 25 feet apart and cultivated the same as peach trees. No more beautiful sight in the way of growing fruits can be found than an apricot orchard loaded with fruit ready to be gathered. The trees require frequent pruning. The best varieties have been brought from Southern Europe and a few from Asia, but many of those most highly prized are seedlings of native origin. Royal, which is a French variety, and Moorpark, of English origin, are two of the most popular varieties grown. Newcastle, Eureka, and Routier are of Californian origin.

THE CHERRY

There are no cherries of importance indigenous to America. The best varieties have been brought from Europe from the time of the earliest settle-

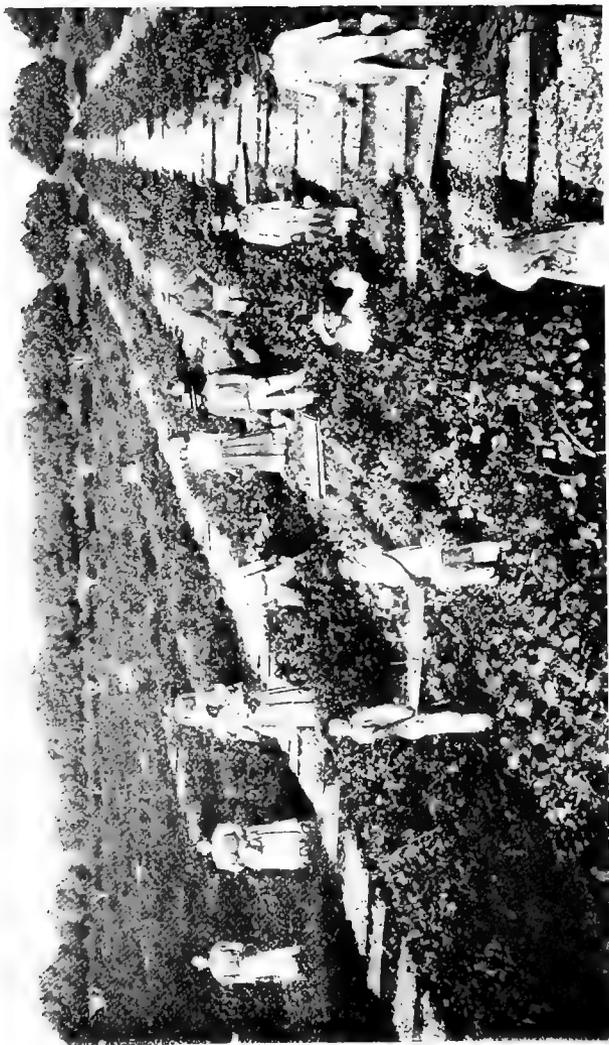
ments of the country until now, and chiefly from France and Germany. Within recent years the demand for varieties that will endure the severe cold of the north-western plains has caused the introduction of several varieties from Russia, but most of them are of such poor quality that they are of little value compared with the standard sorts. Many seedlings have also been grown from the first imported varieties, and are now among the most valuable grown. Generally speaking, there are two classes of cherries—sweet and sour—although there is a more rational classification by which they are divided into *Mazzards*, *Hearts*, *Bigarreaus*, *Dukes*, *Amarelles*, and *Morellos*. These classes all have well-defined distinctions, but for our present use we will consider only the two, the first including all those of upright, rank-growing habit and bearing sweet or mild-flavoured fruit, and the second those varieties with low heads, slender twigs, and very tart fruit.

DISTRIBUTION.—The region where cherries succeed best is on the Pacific Slope, especially Washington, Oregon, Idaho, and California. Some have been grown there that were by actual measurement over an inch and a quarter in diameter, and those an inch in diameter are common. The foothills and valleys of the Appalachian mountain-chain, from Western New York to Southern Virginia, are well suited to cherry culture. In all of these regions there are single trees which have borne more than fifty bushels of fruit in a year. Over the rest of the territory where the apple, peach, and other ordinary fruits succeed, which includes the province of Ontario in Canada in addition to most of the United States, cherry culture is more or less successful. Sour cherries will endure more severe cold and more violent changes than the others.

CULTURE.—Cherry trees being of variable size and habit of growth are planted differently. Trees of the sweet class generally require to be about 30 feet distant and sometimes more, but the sour varieties do not need to be over 25 feet apart. Clean culture is best for them, and manuring the soil that is not naturally rich. Of the sweet class there is a very large list of excellent varieties, of which the *Tartarian*, *May Duke*, *Napoleon*, *Bing*, *Lambert*, *Centennial*, *Hortense*, and *Windsor* are among the best. Of the sour class, which has fewer varieties, the *Richmond*, *Dyehouse*, *Montmorency*, and *English Morello* are the most popular.

THE QUINCE

Of all orchard fruits the quince is the least valuable, and is only grown sparingly. Almost every farm or small country place has a tree or two, and sometimes a small orchard is found. The quince delights in rather moist soil and a cool but not severe climate. In some districts there are commercial orchards as large as 40 acres. The trees are set about 15 feet apart, trained very low, and kept in a high state of cultivation. The variety called *Orange* is the best, although there are a number more that are good. *Rea* and *Missouri* are early, and *Champion* and *Van Deman* late ones.



DRYING RAISINS IN CALIFORNIA.

THE GRAPE

Grapes grow wild in every part of North America, from the St. Lawrence river to the Gulf of Mexico. There are twenty-six recognised species of *Vitis*, varying in hardness of vine, character of fruit, and in many other particulars. No part of the world is so rich in native grapes as North America. The Spaniards made wine of them in Florida as early as 1564; the English colonists did the same at Roanoke, Jamestown, and Plymouth prior to 1630, and the French at their settlements along the Mississippi and elsewhere, but they all found it inferior to that made from the grapes of their native countries. They naturally concluded that if wild grapes grew everywhere here, so would the delicious sorts that had come down to them from Palestine. Cuttings were brought over and planted. William Penn established a vineyard of the varieties of *Vitis vinifera* near Philadelphia in 1683. The French planted vineyards of these choice sorts in Virginia and along the Mississippi. The most notable attempt was made by James Defour of Switzerland, in 1799, in Lexington, Kentucky, where 633 acres were selected, and a company with \$10,000 capital organised. But all these attempts proved disappointing. The vines did not flourish, and no one could tell why. It was the ravages of fungus diseases and the insect called phylloxera, one working on the leaves and fruit, and the other on the roots, yet in such ways as were then mysterious to the viticulturists. The native grapes were proof against them.

IMPROVEMENT OF VARIETIES.—The next step was to select the best wild varieties, and here began the improvement of our native grapes, which has developed into wonderful proportions. Although these first varieties have long since been abandoned for better ones, they gave a great stimulus to American grape culture. The next epoch of importance was the introduction of three varieties which came up from self-sown seed, that were the results of the accidental cross-pollination of our native grapes with some of the delicious foreign varieties that had so utterly failed to flourish. These were the Isabella, Catawba, and Delaware, all being of distinct and widely separated origin. All of them were eminently successful, and the Catawba and Delaware are now, after more than fifty years of trial, counted among the most delicious and successful of our grapes. But the discovery and introduction of the Concord grape had the most potent influence of all. It was discovered growing wild near Concord, Massachusetts, about 1850, and is of pure native blood, being a chance seedling of the species *Vitis Labrusca*. It is to-day one of our leading grapes, and there are millions of acres of it in bearing, scattered from Canada to the Gulf of Mexico. From it have been grown thousands of valuable seedlings, directly and indirectly, from which have been selected many choice varieties. Some of them are the result of skilful crossing with the best varieties from southern Europe. The varieties are red, white, and black, with all the intermediate shades and tints, and they vary as much in flavour and other characteristics, but they seem to meet our wants, except for raisins.

VINEYARDS.—The first commercial vineyard of importance in America was planted by Nicholas Longworth, about 10 miles below Cincinnati, Ohio, on the

hills overlooking the Ohio river, and chiefly with the Catawba. Many more were set there, until the hillsides for miles around were dotted with Catawba vineyards, but the mildew and black rot, two native fungus diseases, almost ruined them because of the European blood in this variety. In Northern Ohio, along Lake Erie and eastern Lake Ontario, and among the smaller lakes of Western New York, where climatic conditions are not so favourable to the disease, the Catawba succeeds very much better. Many thousands of car-loads of grapes are annually shipped from Western New York to all parts of the eastern States, and sold at a very low price. The varieties are mostly Concord, Catawba, Niagara, and Delaware, although there are many more almost equally good. The southern States, especially Florida, North Carolina, and Texas, also produce many grapes of the same character, which find a ready market in the north because of their earliness. The central States, especially Kentucky, Illinois, Missouri, Kansas, and Michigan, are well suited to grape culture. In Wisconsin and Minnesota the vines have to be laid down and covered with soil during winter to protect them, but in all the other regions nothing of the kind is necessary.

THE VINE IN CALIFORNIA.—But in all North America there is no region where the grape flourishes as it does in California and some other States of the Pacific Slope. There the most delicious grapes of the Mediterranean countries are at home. They ripen their clusters in perfection under the glowing skies. The grapes of Eshcol, perhaps, did not equal those of California. It is nothing uncommon there to see single clusters weighing 4 to 5 lbs., and they sometimes reach 15 lbs. Their quality is excellent. The size and numbers of the vineyards are without comparison anywhere in the world. There are in California vineyards of 2000 or more acres under one management. There are wine-cellar many acres in extent. The raisin industry is immense. Nearly 110,000,000 lbs. of raisins, filling 6000 large freight cars, have been marketed in a single year. Shipments of fresh grapes are as extensive as the eastern markets will justify. Flame Tokay and Corinchon are the principal varieties sold in the fresh state, and for making raisins the Muscat of Alexandria and Sultana.

CULTURE.—At first the European methods of planting, training, and cultivating vineyards were followed, but our native grapes would not do well with such short pruning. This led to wider planting and the use of trellises instead of stakes. It is rare that the rows are planted in the eastern vineyards closer than 8 feet, with the vines 10 feet apart in the rows. There are many styles of trellises used, and different methods of pruning and training; but posts with three wires attached are most common, and a long spur system of pruning. In California and all the region where European grapes are grown they are usually planted in squares 8 by 8 feet apart, and the vines 4 feet in the rows. This gives better opportunity to work the soil and remove the trimmings and fruit. In all but a few cases the vines are trained to stumps about 2 feet high, from which the bearing wood grows out each year. The pruning is very severe, for only mere stubs of the young wood are left at the top of each stem. No trellis or other support is needed, except in the cases where a few varieties are grown that will not endure this treatment, and while the vines are very young.

In all parts of the country and for all classes of grapes thorough tillage by horse-power is the common practice. Tools are made that leave very little to be done by hand. Manuring is resorted to where the soil is not naturally fertile enough, but this is rarely the case until the vineyards have borne several crops.

THE BERRIES

Undoubtedly North America leads the world in the popular use of berries. They are not a luxury with us, but a common article of food. The aboriginal inhabitants used them freely, as they grew in the wild state, and they are still so gathered in large quantities by our people; but almost every native species has been brought under cultivation and others introduced from foreign countries. This work is still going on, and many crosses are made in every conceivable way between varieties, and in some cases between species, with the most favourable results.

THE STRAWBERRY.—The most common of all this class of fruits is the strawberry. It grows wild from Alaska and Hudson's Bay to Mexico. There is not a State or territory where it is not cultivated and the fruits consumed in great abundance. Both city and country people enjoy strawberries and cream when the fruit is in season. By the modern means of transporting in refrigerator cars strawberries are sent for thousands of miles, and it is possible to find a few in the fancy markets at almost any time of year. During the flood-tide of ripening the humblest may indulge in at least an occasional feast of fresh strawberries. They are sometimes retailed at five cents per quart. There are single railway stations from which more than 100 car-loads of 16,000 quarts each are sent in one season. Fields of 50 to 100 acres belonging to one grower are not uncommon. The methods of culture do not vary greatly, and all of them include the use of horses very largely. By the use of modern tools there is little left for the hand-hoe to do. Even planting is done by machinery in some cases. The most common system of cultivation is what is called the matted row. The plants are set about 2 feet apart in rows that are from $3\frac{1}{2}$ to 5 feet apart. By frequent stirring of the soil with horse-cultivators it is kept loose and free from weeds, except in the immediate line of the plants, where some handwork is often necessary. The young plants are allowed to spread over a strip, varying, according to the wish of the grower, from 1 to 3 feet wide. Another plan is to put the rows about 3 feet apart, and the plants a foot apart, or a little more, in the rows, and keep all the runners cut off. This necessitates what is called the stool system. It produces the largest berries, but requires much work. By either method the best growers never allow the plants to bear more than two crops, and some but one. If they are left longer the weeds and grass become very troublesome, and the berries are not so large as on young plants. It is cheaper and better to plough them under and spend the labour on new plantations. The native varieties are well flavoured but small in berry, and this caused the first attempts at cultivation to be made with the English varieties. But the two species were soon hybridised, and a new race was thus originated that surpasses either alone. We now have varieties of

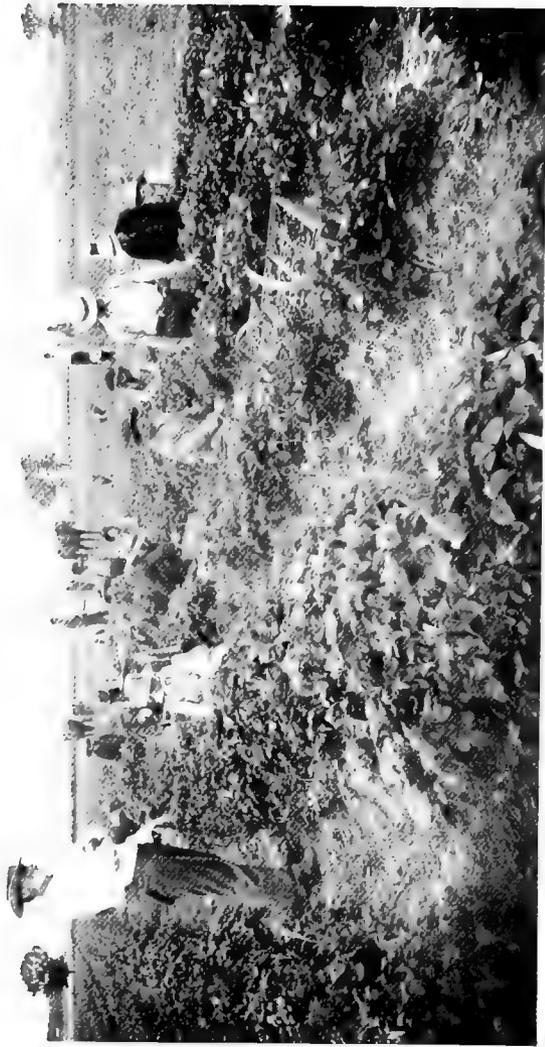
exquisite flavour that will yield from 6000 to 20,000 quarts per acre. There are about 500 named varieties of good quality, and more are being raised every year. Michel, Glen Mary, Crescent, Aroma, Bubach, Warfield, Marshall, Williams, and Gandy are a few of the best.

THE RASPBERRY is another very common fruit in America. It grows wild in many regions, but not everywhere. There are at least three species in cultivation. Fewer raspberries are gathered in the wild state than of most other berries, but not because they are poor flavoured or small. The first cultivated raspberries were of the European species, but they were soon dropped for the more valuable natives. By the selection of the best seedlings and by crossing a very choice list of varieties has been developed. There are two distinct classes of raspberries in general cultivation. One is a native species, *Rubus occidentalis*, which never spreads from the roots, but layers at the tips. The fruit is either black or yellow. Some of the best varieties are Kansas, Ohio, Eureka, M'Cormick, and Gregg, all of which are black. The other class is a combination of our two species, *R. strigosus* and *R. neglectus*, and a few crosses of the European species, *R. Idaeus*. The fruit is red or purple, except an occasional yellow variety. Cuthbert, Columbia, Cardinal, Malboro, Loudon, and Golden Queen are the leading varieties. The plants are set about 3 feet apart in rows that are from 6 to 10 feet apart. Horse culture is used to keep the soil loose and prevent the escape of moisture from the subsoil. Stable manure is the common means of maintaining fertility.

BLACKBERRIES are so abundant in the wild state that only within the last fifty years have they been brought under cultivation. We have more than a hundred named varieties of very choice quality, including the dewberries, which are trailing species of the blackberry family. The upright blackberries are grown in rows, as described for the raspberries. Sometimes they are mulched with straw. Any coarse manure or litter is excellent. The Kittatimy, Agawam, Minnewaska, Erie, Eldorado, and Snyder are a few of the best varieties. The dewberries or trailing species ripen much earlier than the other class, and although they are more troublesome to cultivate and train, they are desirable because of their season of ripening. Lucretia, Mayes, and Windom are among the best varieties.

GOOSEBERRIES are only grown to a limited extent, because we have other and better berries, and also because mildew affects the European ones. Our native sorts are proof against this disease, but their fruit is small although of good quality. The English and German gooseberries are being cultivated more than formerly, because it has been discovered that spraying the bushes with a preparation of sulphur will prevent the ravages of mildew. In some sections gooseberries are grown in large fields and cultivated by horse-power, but usually only as many are grown as each farmer may want for home use. Whitesmith, Industry, Red Jacket, and many seedlings of native origin from both our own and foreign species are grown.

THE CRANBERRY is a native of the bogs and marshes from the North Atlantic coast to Alaska on the west. It loves a cool climate and plenty of water. For many years no attempts were made to cultivate it, because the wild



*A STRAWBERRY FARM IN WISCONSIN. MEN AND BOYS ARE GATHERING THE
FRUIT AND LAYERING RUNNERS.*



A BUSY SCENE IN A MICHIGAN BLACKBERRY FIELD.

bogs furnished all that were needed ; but now there are thousands of acres of cultivated cranberry marshes. It is the business of specialists to own, plant, and care for them throughout. Dams are built about the marshes or fields, which may be flooded at will to prevent frosts and kill insects. More than 1,000,000 bushels are marketed every year, and the business is extending. There are many named varieties, called Bell, Bugle, &c., which were selected from the wild stock.

CURRENTS have been successfully grown in gardens from the time of the earliest settlements until the present time. Nearly all the varieties are from European species, but many of the best are grown from seed in this country. The cooler or more northern part of the country is by far the best for the currant, for in hot and dry regions its culture has either been abandoned or is attended with difficulties. Where it is successful there are plantations of from 10 to 50 acres each. The red varieties, such as Fay, Victoria, Cherry, Red Dutch, and Wilder are mostly grown, but there are a few of the white and black varieties cultivated in a small way. Americans do not like the black currants.

OTHER BERRIES.—There are several other berries of minor importance grown, such as the Juneberry, Huckleberry, Blueberry, &c., but, as yet, their wild fruits are sufficient to meet the demand.

CITRUS FRUITS

Since the introduction of the orange, lemon, and lime by the Spaniards in Florida in their search for gold nearly four hundred years ago, and the advent of the Catholic Fathers in California at a later period up to within the last forty years, only a few scattered trees bore fruit. About 1860 there was a little interest shown in their culture in Florida, Louisiana, and California. The immense production and trade in American-grown citrus fruits have developed since that time.

THE ORANGE was first grown in extensive orchards on the Mississippi delta below New Orleans, but the repeated frosts in that region have damaged the trees so seriously that the growers are badly discouraged. The fruit there is of good quality, but most of the trees are seedlings. After the Civil War, about 1865, many of the soldiers from the northern States settled in Florida, and began budding the wild groves of orange trees there, which had grown up and spread from the few trees planted by the Spaniards hundreds of years before, with the best varieties to be found. Choice varieties were also brought from the Mediterranean countries and from Japan, China, and the East Indies. Extensive orchards were planted and cultivated in the best possible way. Orange-growing became the chief industry of Florida, for before the severe frost of 1895, 5,000,000 bushel boxes of fruit were shipped. Many of the orchards were killed to the ground at that time, but most of them have grown up since. In Southern Florida the trees were injured slightly or not at all. Now the production is approaching its former proportions. In

California, orange-growing was of little consequence before the introduction, in 1870, of a seedless variety that we now call Bahia, or more commonly, Washington Navel. This was procured by our national department of Agriculture from Bahia, Brazil, and proved the most eminent success in California and Arizona, although in Florida it does not bear abundantly for some climatic reason. While there are other varieties of the orange of as good flavour, in some respects, there is none that equals it, all things considered. It is the principal variety grown in California, which state now annually ships about 7,000,000 boxes, with an increasing production. Very few seedlings are grown there, and only a small proportion of Maltese Blood, Mediterranean Sweet, and some other named varieties of the orange that originated in this country. The native and foreign lists now exceed two hundred varieties, but only a few are grown extensively. The trees are set from 15 to 40 feet apart, according to the requirements of the varieties used. The dwarfish Japanese or mandarin class are sometimes set as close as 10 to 15 feet apart, but most varieties require from 25 to 30 feet. They are given good cultivation by the most modern orchard tools. Manuring is quite necessary in many sections of Florida, and to some extent in California and Arizona.

THE LEMON is also grown commercially, but mostly in California. About 3,000,000 boxes are now sent to the eastern States from there annually, and there is a steady increase. There are orchards in Southern California of more than 500 acres in extent. The best varieties from Italy and Spain have been introduced, and several very choice seedlings have originated, one of which, named Eureka, is seedless and of the first quality otherwise. Our people have learned when and how to gather and cure lemons, so as to compete with the foreign product, and it is probable that the importation of lemons will soon decrease.

THE POMELO is a member of the Citrus family from Siam, Ceylon, and other East Indian countries that is being grown quite extensively in Florida and California. Our people are becoming very fond of it; although at first it was not relished because of a slightly bitter flavour. By selecting the best seedlings, naming them and propagating by budding, marked progress has been made in the way of varieties. An average specimen will weigh about 1 lb. They resemble large oranges, except that they are more flattened and of a lemon colour. The trees are treated about as for orange or lemon trees, and bear most abundantly. As the fruit sells at a high price it is not uncommon for one tree to produce a net revenue of from £10 to £20 in a season.

THE KUMQUAT is the smallest of the Citrus fruits, not being much larger than a thimble. The varieties are round or oblong in shape, and the colour of oranges. They are delicious in flavour, and are usually preserved whole, although they are good eating in the fresh state.

THE CITRON is grown but very little, as yet, in America. A few of the best varieties from Italy and Corsica have recently been introduced, and a few tons of the preserved article have been made in California and Florida. We have proper soil and all other requirements for growing citrons of the best quality, and it will not be long until an abundance is produced.

THE FIG

Figs have been grown in the warmer portions of America in a small way for centuries, but not until the introduction of the fig wasp (*Blastophago psenes*) from Turkey have they been grown in large commercial orchards. Many varieties have been introduced, and some of them bear abundantly ; but only in California have they been dried with profit. The famous "Smyrna" brand of dried figs has been recently duplicated in that state by the importation of cuttings from Turkey, where the choice figs are grown that are packed at Smyrna and excel all others in the markets of the world. The wild or Capri fig trees, with the little insect that carries the pollen to the flowers inside the edible variety, have also been safely established in California. There are now a few orchards of this variety in bearing and others just started, and many tons of dried figs have already been sent to market that are equal to the best grade of Smyrnas.

THE OLIVE

Olive culture was attempted in the Carolinas and along the Gulf of Mexico at an early date, but with almost no success, owing to unfavourable climatic conditions. In California, the mission fathers found that the olive did well ; but not until within about the last twenty-five years has its culture been pushed. Now we have in that State most of the varieties from Europe, and there are large orchards, oil presses, and pickle factories established there. The quality of both the oil and pickled olives is equal to the best imported from the markets of Europe.

THE DATE

In some of the hottest and dryest parts of Arizona and California there are ideal climatic conditions and suitable soils for the date palm. A few trees grown from seed at some of the Catholic mission stations more than a century ago are still standing ; but few of them have borne, owing to the fact that they were male trees or those of the opposite sex that were alone or too far from those bearing pollen. However, enough fruit was produced to encourage the importation of rooted suckers of the best varieties from Arabia, Algeria, and Persia. The first of these choice trees were brought over in 1889 by our National Department of Agriculture, and have been bearing for several years. Many more have since been imported by the Government and are growing at trial stations, and agricultural explorers are still at work collecting them in foreign countries and sending them here. As there are millions of acres of good land in Arizona and California, where the summers are long and hot and the winters mild, and there is abundant water for irrigation, we have every reason to believe that America can and will produce an abundance of dates of the best quality. Already some have been cured, and clusters of fresh dates of several varieties have been sent east to show what can be grown.

THE MANGO

In Southern Florida there are many large mango trees that have sprung up from seed, but the fruit being mostly inferior our Government and some private individuals have secured grafted trees of several of the choicest varieties from India. One variety, the Mulgoba, is already in bearing, and some of the older trees are quite large. Our fruit of this variety is said by those who have eaten mangoes in India to be equal in size and flavour to any grown there. Thousands of acres can be planted with mangoes if desired below the line of danger from frost in Florida, and in a few places in California. Orchards are now being planted with choice varieties.

THE PINEAPPLE

Of all the strictly tropical fruits there is none that is grown so extensively as the pineapple. Many thousands of acres are devoted to its culture in Southern Florida, which is the only region where it succeeds within the United States. Our markets are so well supplied with the home-grown product that but few pineapples are imported, although a few years ago all that were consumed were grown in Jamaica and other tropical islands. There are two methods of growing. One is in the open field, just as cabbages are grown. The other plan is to plant under lath sheds, which admits of growing the most tender varieties; fruit of the largest size and most delicious flavour is then obtained. The variety generally grown under sheds is the Smooth Cayenne. Abakka and many others are also grown to some extent. These sheds are about 7 feet high and are made in a substantial manner. It has been found by experience that shedding not only makes it possible to grow pineapples where there is a little frost by covering over with muslin in winter, but the shedding does good in summer by tempering the fierce rays of the sun. Red Spanish is the variety commonly grown in the open field. The plants are set about 2 feet apart each way and kept free from weeds with the hoe. They bear two good crops, and are then dug up and the ground replanted.

MISCELLANEOUS TENDER FRUITS

There are many tropical and semi-tropical fruits which are grown to some extent. Among these are the Banana, Avocado Pear, Guava, Tamarind, Sapodilla, Kaki, Loquat, and Pomegranate. Some of them flourish exceedingly well and are becoming improved and cultivated, so that they are not only interesting but quite profitable.

NUTS

THE COCOANUT in Southern Florida is grown with success from Key West fully 100 miles northward, but more as an ornamental tree than for profit.

THE SWEET ALMOND is grown in Californian orchards of 500 acres or

more in extent in some cases, and many car-loads are produced each year. The quality is equal to that of any imported from Europe. Especially is this true of some of the varieties originated in California.

THE PERSIAN WALNUT or Madeira nut is grown in California in large orchards, and to such an extent that its importation has almost ceased.

CHESTNUT CULTURE is also assuming considerable proportions in America. We have two native species that bear nuts of excellent quality, but they are rather small. Many thousands of bushels are gathered each year from the forests and sold at moderate prices. The best varieties from Europe and Japan have been imported, and many seedlings have been grown from them that are even better. There are a few chestnut orchards of more than 200 acres, and many smaller ones have been made by grafting the choice varieties on native sprouts, where the forests have been cut down. There are also a few small orchards of grafted nursery-grown chestnut trees that are bearing abundantly.

THE PECAN (*Hicoria pecan*) is a native nut that is found abundantly in the lower Mississippi Valley, where the trees often attain very large size. Large quantities are gathered and sent to market, especially from Texas. Within the last twenty-five years this nut has been brought under cultivation. Many choice native varieties have been selected and propagated by grafting and budding. Others have been originated from seed, until we now have a very choice list of named sorts. The trees are set in orchards, about as for apples, and cultivated until they begin to bear, which is usually about ten years old. The pecan requires very rich moist soil, and does best where the summers are long and hot.

FILBERTS are cultivated only to a very limited extent, because a fungus disease preys on the leaves and wood of the European species in most regions. In Washington and Oregon this trouble does not exist, and the best varieties known are planted there and are beginning to bear abundantly. We think that they will grow there as well as in England or in any other country. Our native wild hazels are abundant in the Central States and bear well, but the nuts are small. Some of the largest are now being tested under cultivation.

FRUIT CULTURE UNDER GLASS

Practically no fruits are grown under glass in America except European grapes in the fruit-houses of a few of our wealthiest people in the Eastern States. There is very little need to grow them thus, because they are grown out-of-doors so much more cheaply. A very few peaches, nectarines, pears, and pine-apples are grown in fruit-houses, but this is done mostly as a hobby. There are perhaps two or three persons or firms growing strawberries under glass, but they have difficulty in meeting the prices of Florida and California, which furnish the markets with this fruit in winter-time from the open fields.

FUNGUS DISEASES AND INSECTS

The American fruit-grower has a swarm of enemies to fight in the shape of fungus diseases and insect pests. There is scarcely a plant or tree that does

not have some enemy of this kind. But science and industry have found means of overcoming them or holding them in check. The rural papers—of which we have more than 100 good ones—the agricultural experimental station bulletins and books on fruit-growing, are replete with directions for combating these evils. Sulphate of copper is the basis of the remedies for fungus diseases, and arsenic for nearly all insect pests.

FRUIT STORAGE

While the great range of climate and the numerous varieties of fruits enable the average farmer or inhabitant of the towns and cities to be abundantly supplied with fresh fruit of some kind at moderate cost during the greater part of the year without the aid of cold storage houses, these have helped materially. They were first built about 1860, and cooled by means of natural ice, but since the invention of chemical refrigeration cold storage houses have been greatly improved and cheapened. Apples, pears, and grapes are now kept for many months in perfect condition. It is a common practice to keep apples in this way until the next year's crop is ready for market.

CHAPTER XXIX

FRUIT CULTURE IN FRANCE

By M. ALFRED NOMBLOT

NOTE.—1 mètre (1m.) = 3 feet 3½ inches; 1 décimètre (om.10) = 4 inches; 1 centimètre (om.1) = ⅔ of an inch. (These are approximate equivalents.)

THE cultivation of hardy fruit trees in France may be regarded from three points of view—firstly, as conducted in experimental gardens, *i.e.* in gardens formed for the purpose of study; secondly, as carried on in private gardens, or the gardens of amateurs; and thirdly, as practised in market gardens.

EXPERIMENTAL GARDENS.—The object of these is not only to teach the proper cultivation of fruit trees, but also to further the study of new varieties; to experiment with new methods of cultivation, and in those methods which are not sufficiently well known. These gardens therefore contain important and varied collections of fruit trees. Their special interest lies not so much in actual produce (which is considered a secondary object), as in the field of instruction and observation laid open to inquirers.

The experimental garden should be situated so as to be easy of access to students and amateurs; the design be such as to be suitable for demonstrations, and it should be capable of growing all kinds and all varieties of fruit trees in their most varied forms, and by widely different processes.

Of course all these conditions are not always advantageously combined in the same spot; and from lack of capital it is often necessary to utilise land deficient in size and quality.

In the neighbourhood of Paris the best gardens of the kind are: L'École Nationale d'Horticulture de Versailles, l'École de la Ville de Paris at St. Mandé, l'École Normale d'Instituteurs de Versailles, l'École le Nôtre at Villepreux (S. et O.), l'École des Frères d'Igny, l'École Fénelon de Vaujours, l'École de Fleury sous Meudon. Many horticultural societies also have their experimental gardens; Soissons is one of those which have done the most in this direction. Indeed most of the big firms of nurserymen have made a point of having in their grounds not only every variety of fruit tree known under most careful nomenclature, but also correct models of training. These collections, constantly added to by novelties as these make their appearance, are carefully catalogued, and serve as a basis for pomological research. All these gardens, as we have said, serve to teach the art of fruit culture; they encourage amateurs, and often give rise to improved methods in fruit-growing for profit.

AMATEURS' GARDENS.—The fruit gardens of amateurs are by far the most common. They are kitchen and fruit gardens combined, the production of

vegetables being intimately connected with that of fruit. These fruit gardens generally comprise a part only of the whole property, their size being in proportion to the required supply. Sometimes standard trees of cherry, plum, apricot, medlar, quince, walnut, &c., as well as some of the hardiest varieties of pear and apple, are grown in an orchard. The aspect varies with the latitude; a southern aspect suits the north of France; a northern aspect suits the south.

For the centre and north of France a situation sheltered from the north wind is preferable. Account must also be taken of the nature of the soil, its physical state, and its chemical composition.

THE DESIGN is made by straight lines cutting each other at right angles, forming squares of from 100 to 500 square mètres, according to the importance of the garden; the walks are from 1 to 3 mètres broad, according to whether they are required for the passage of carts or of barrows only. Borders are marked off inside the enclosing walls, and around the squares as margins to the walks; they are from 1 to 2½ mètres wide, and are planted with lines of espaliers, cordons, and pyramids. The ground should be levelled, and the enclosure formed, as far as possible, of stone or brick walls, surmounted by a projecting coping. Sometimes in cold districts partition walls are built, of which the two sides are planted—the direction of these walls is from north to south. No matter what the walls are made of, they are covered with trellis work, either of iron and wood, or altogether of wood; the supports placed in two or three rows according to the height of the wall, and parallel to the soil, are made of iron wire, or crossbars of wood to which rods are fixed. The wood most commonly used is pine. It ought, if possible, to be painted. The distance between the uprights is from 0m.25 for peaches and vines, to 0m.30 for other kinds of fruit. For the peach, in order better to secure the shoots, two short rods are added between each of the vertical uprights. The edgings to walks are preferably made of box.

WHAT TO PLANT.—The planting of an amateur's garden is a matter requiring the careful selection of good varieties—of the best quality rather than of large size, and abundant bearers. The distribution of the trees also greatly influences the results. Thus the vine, the peach, the Doyenné d'Hiver pear, and the Calville apple, requiring much heat to ripen their fruit, and disliking the cold, are planted against south or east walls. Autumn and winter pears are planted against a west wall. Summer pears, and some of the most fertile varieties of cherries, are reserved for the north wall. Hardy apple and pear trees, with slender and spreading branches, are all suitable for espaliers. The hardiest varieties of these, with upright and strong branches, are planted as pyramids or bushes. Apricots, cherries, and plums, good cropping apples, and cooking pears, all hardy trees, whose flowers and fruits are but little affected by hail or wind, should be planted as pyramids or standards. Large fruiting apple trees make good horizontal cordons. The distance apart at which these trees are planted varies with the richness of the soil, the vigour of the variety, height of the wall, aspect, humidity of the soil, &c.

The distance between fan-trained trees should be as many times 0m.30 as the number of branches it is desired to obtain. Pyramids are planted 3 m.,

vases 2m.50, goblets 3 m., horizontal cordons 3 m. or 4 m., vertical cordons 0m.40, and oblique cordons 0m.50 apart.

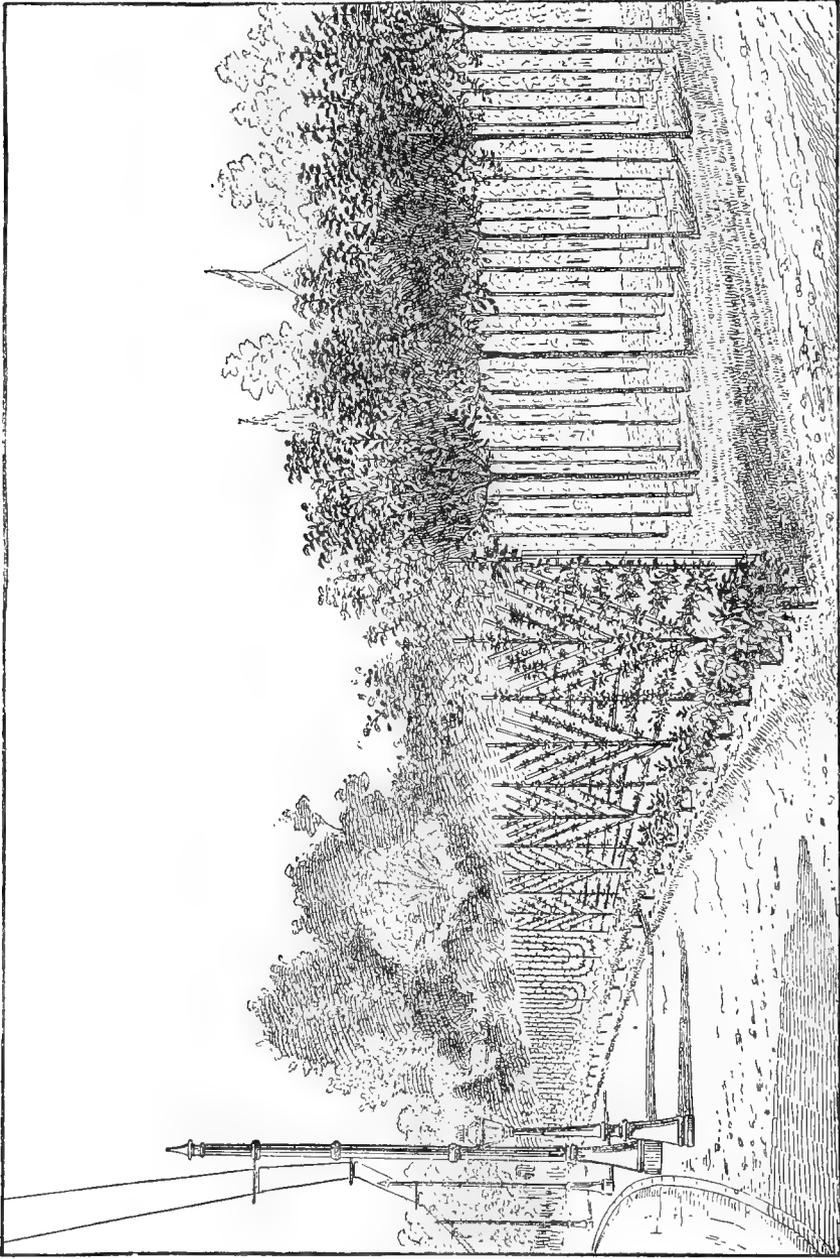
MARKET GARDENS.—These gardens differ from the two mentioned above in that they do not admit of much detail—they must be simple and practical. The cultivation is exclusively that of fruit, and is carried on in good land not far from the great centres of population, in order to provide for the disposal of the produce and the obtaining of manure. The varieties of fruits, very restricted in number, are selected from those best suited to the district and whose sale is certain from their commercial value.

Nothing is neglected in the management of the garden, the preparation of the soil and the distribution of the trees (which are planted more closely, if it be possible, than in amateurs' gardens) are such as to ensure the highest success.

A commercial fruit garden presents an enclosure well exposed to the sun and air, with the enclosing walls not very high; sometimes with partition walls, upon which are cordon apple trees; then squares planted with pyramid and vase-shaped trees, margined with borders of espaliers; at other times espaliers entirely occupy the squares. The wall and the espalier trees in spring are protected from spring frosts by movable shelters made of straw, wood, or glass. Commercial fruit culture is practised in the neighbourhood of Paris at Montreuil, Bagnolet, Deuil, Sannois, Montmorency, Argenteuil, &c., and more or less throughout France; Williams's Bon Chrétien pear in Anjou; apples at Mans and Auvergne, where every variety of Reinette is cultivated and sent to Paris; apricots at Triel (S. et O.), and grapes at Thomery and at Maurecourt are specialities. Lyonnais and the south provide early and white-heart cherries and peaches from the open air; the east and the region of Agen furnish cherries for the manufacture of "kirsch," and plums for preserving; while the neighbourhood of Paris gives the English cherry, and Montmorency fresh plums, &c.

In order to perfect the production of fruit for the home and foreign markets some experiments have been made, notably in the department of L'Oise, at M. Labitte's, where a farm has been planted. The arrangement adopted is as follows: Lines of standards are planted at 10 mètres from each other. Until these standards cover the space, a row of vase-shaped apple trees is planted between them, at 5 mètres from the standards; then at 2 mètres from the apple trees (forming a line on either side), two rows of pyramid pear trees; and finally, to the right and left of the standards, at 1 mètre distant, groups of currant bushes. So much for the large open squares; others are planted with single and double espaliers. Finally, the walls of the enclosure are covered with vines and peaches.

TRAINED FRUIT TREES.—In place of the ancient custom of planting trees one year old, almost everywhere in France fruit trees already formed or half formed are now made use of. These trees being well prepared, well trained, and carefully taken up, take root again as well as maiden trees, bear fruit much sooner and more abundantly, and the fruit is better. The cost at first appears greater, though really it is more economical, for stocks treated in



A GROUP OF ESPALIER TRAINED AND STANDARD FRUIT TREES

The distant half of the trellis is covered with Palmette Verrier, and the near half with Cossonnet fan-trained trees. Those alongside the walk are horizontal cordon apple trees.

thousands by specialists in nurseries cost much less than when the trees are grown by private individuals.

Transplanted trees have more numerous and shorter roots than those which are not transplanted, and for this reason derive their nourishment from the surface of the soil. To obtain the best results, trees which have not been transplanted in the nursery should not be older than : Pears and apples, two, three, or four years at the most ; peaches, apricots, plums, cherries, &c., two or three years at the most. Trees which have been transplanted in the nursery : Pears and apples may be three, four, five, and six years old ; peaches, apricots, plums, and cherries, three, four, and five years ; standards not formed, one to three years ; standards formed and transplanted, from three to six years old.

FRUIT TREES IN POTS.—This method of cultivation is now spreading more and more among amateurs, and especially in towns where, deprived of gardens, people appreciate not only flowers in their rooms but also fruit trees, which are charming when in blossom and valuable for their fruits. An orangery, courtyard, terrace, or balcony is sufficient for these trees, provided they are sheltered from the frost in winter and not allowed to become too dry in summer. An annual repotting in the autumn with good fresh soil and watering during the summer as often as required are necessary. Once a week liquid manure is given. Cherries, plums, peaches, and grapes are the chief fruits cultivated in pots ; but currants, figs, pears, apples, raspberries, apricots, medlars, and even quinces afford much satisfaction when thus grown. The idea of this most interesting phase of culture is to obtain as much fruit as possible within a minimum space.

THE SOIL.—To prepare land for a fruit plantation one must know the needs which the soil will have to supply, its state and nature, and the proper means of modifying the composition in order to ameliorate it. Let us therefore examine these questions in connection with the humidity, physical constitution, chemical composition, and aeration.

HUMIDITY OF THE SOIL : DRAINAGE.—Moisture in excess is hurtful to the land, because it prevents aeration and warmth, tends to encourage late frosts, and retards vegetation in spring. Trees which grow in a wet soil are more sensitive to frost ; rooting after transplantation is also more difficult.

To overcome excess of humidity drainage is resorted to ; either by open drains, or by trenches filled with stones, or still better by drain-pipes, the diameters of which vary according to the volume of water to be carried off. The depth of the trenches or drains varies, 1 mm. inclination per mètre is sufficient for pipe-drains, but from their greater resistance to the flow of water, other drains require more.

To drain a border at the foot of a wall, the foundation must be so placed as to carry the water away from the wall, and turn it aside by some means or other. If the soil does not permit of a slope, recourse is had to wells, into which the drains empty themselves. If none of these methods is sufficient, the only thing to do is to plant upon elevations or mounds, so that by increasing the depth of the soil to be cultivated, the trees may be above the level of the water. Drainage impoverishes the soil a little by carrying away some soluble manure in the water. This must be taken into account.

PHYSICAL CONSTITUTION OF THE SOIL.—According to the proportion of the four essential elements, namely—clay, chalk, sand, and vegetable-mould, we shall have a strong and cold, or a light and warm soil, with all the variations between the two. Clay which holds water permits but little air to penetrate, and renders the soil wet and cold. Manures decompose slowly in it, and the vegetation which it supports is slow and backward in growth. Chalk under the form of carbonate of lime is most frequently blended with carbonate of magnesia and phosphate of lime; in its pulverised state it acts upon the decomposition of organic manures, and provides a certain amount of soluble mineral element. Sand or flint renders the soil workable, permeable to water and air, and consequently promotes quick growth, but it is not favourable to the retention of manure, which quickly disappears in it, and must be frequently renewed. Humus or vegetable-mould is an element of fertility; it is workable, and permeable to air and water. It heats, cools, and dries quickly; also, by absorbing oxygen, it facilitates the decomposition of manures.

A PERFECT SOIL contains from 20 to 30 per cent. clay; 50 to 70 per cent. sand; 5 to 10 per cent. chalk (pulverised); 5 to 10 per cent. mould. A soil is too clayey and cold if it contains more than 40 per cent. of clay, and less than 50 per cent. of sand; too chalky if it has less than 10 per cent. of clay, and more than 10 per cent. of lime; too sandy and hot if it contains less than 10 per cent. of clay, and more than 60 per cent. of sand. With any given soil, all that one need do, is to analyse it, and compare its composition with the notes given above, in order to learn what ought to be done to obtain the best results. If it is too clayey, sand must be added; sweepings from the road will do, or even a little sea-sand, if lime is not too abundant in the soil. If it is too light, strong earth, or turf, or clayey marl must be incorporated with it. Humus in the form of horse manure may also be applied to heavy land, and in the form of cow manure to sandy land. If the land is too chalky from the mechanical point of view it is treated in the same way as a sandy soil; but if it be too chalky from the alimentary point of view, the influence of the lime must be diminished. If the neutralising effect of sulphate of iron does not suffice, one-third or even half the soil must be removed, and replaced, in order to reduce the proportion of lime, by soil containing none of the latter.

CHEMICAL COMPOSITION OF MANURES.—We have seen that the physical properties of a soil are very varied according to the proportion of its constituent elements, that drainage impoverishes the soil, and that light warm land, especially if chalky, is much more rapidly exhausted than cold land. From these facts it follows, that in order to obtain the best results, the quantity of manure, the manner of using it, and the form in which it is employed ought not always to be the same. As to the quantity, a warm soil will require more manure than a cold one; and *vice versa*. It must be given more often, and less at a time, to warm than to cold land. For warm land, cold manure from well-decomposed heaps should be taken; while for cold land, warm manure in active decomposition is preferable.

The elements of fertility are many, but most are found in the soil. We will only concern ourselves with the four principal, namely—nitrogen, phosphoric

acid, potash, and chalk. Farmyard manure contains per cubic mètre 80 per cent. water ; 0.13 per cent. phosphoric acid ; 0.49 per cent. potash ; 0.55 per cent. lime ; 0.49 per cent. nitrogen ; 5 per cent. minerals secondary importance ; 13 per cent. woody fibre. Town night-soil contains a little less nitrogen and potash, and a little more phosphoric acid than farmyard manure.

Though natural manure is indispensable in order to ensure to the soil its richness in humus, yet it does not suffice, and the many artificial manures are valuable complements on account of their economy in manipulation ; and because, taught by the composition of the soil, and the needs of the trees, we can apply any requisite element to the exclusion of others. With natural manure, in order, for example, to apply a certain quantity of potash, we should have to add in a manner as costly as it is useless, a great quantity of phosphoric acid, lime, and nitrogen. In the use of chemical manures, the analysis of the soil and of the plants is a very valuable, though not absolute indication. Nitrogen acts chiefly upon leaf growth, and is recommended for trees fertile yet not very vigorous. Phosphoric acid, on the contrary, allays foliaceous growth, and ensures fruit production. Potash favours a good growth of wood.

AERATION OF THE SOIL.—The improvement of land can only take place by the different substances being mixed well together. This is effected by digging and trenching. The depth to which the soil must be moved varies. A good alluvial soil requires but little digging, while a clay soil demands deep tillage ; trees with tap roots require much deeper tillage than the same trees upon stocks with spreading surface roots ; for example, the pear upon the quince.

For pears upon the pear stock, the peach upon the almond, digging to the depth of 1 mètre is necessary ; while for pears upon the quince, and for cherries, a depth of 0m.80 is sufficient ; finally, peaches upon the plum stock and the apricot are satisfied with from 0m.60 to 0m.70. Whatever method of digging is employed, it is well to perform it some months before planting.

PLANTING.—Planting is done from the end of October to the beginning of April, always supposing it is not prevented by frost, heavy rain, or scorching sun. Planting in dry and light soils is best done early ; in those which are strong, cold, and wet it is preferably done late. When planting in spring it is well to soak every plant in order to make the earth adhere to the roots ; if late in the season and warm, it is a good thing to steep the roots in a tub containing a mixture of liquid clay and cow manure. In preparing trees for planting cut back any bruised roots and trim broken branches. Cut off vigorous branches to a third or a quarter of their length in order to obtain a symmetrical tree. When the tree is planted the swelling caused by the graft should be just above the soil. In planting wall trees the collar of the tree should be some little distance from the wall in order to facilitate the development of roots on that side. When the soil has been well prepared beforehand in the manner indicated it is only necessary to make a hole suited to the extent of the roots, around which these are spread. Planting is done by two men ; one holds the tree while the other places fresh soil round the roots. Afterwards it is made more or less firm, according to the state of the soil. A wet soil

should not be pressed down at all, or very little ; there should be no vacant spaces about the roots, however.

CARE AFTER PLANTING.—After planting, standard trees are staked in order to resist the wind. Wall trees and espaliers must not be tied so tightly as to prevent their settling down with the soil. The stems of standard trees should be sheltered from the hot sun by a little straw. The soil at the foot of, and especially near, a fruit wall is covered with farmyard manure. Finally, waterings are given as often as needful. The soil should be top-dressed ; this retards direct evaporation and checks that of the plants.

PRINCIPLES OF PRUNING.—The principles of reasonable pruning (which must not be confounded with the mania some people have for cutting everything) depend upon the food supply of plants and elaboration of the sap, the rest consists but of a trick of the hand—a plan to render fruit culture possible where it otherwise could not be practised. Fruit trees have two sources of food :—*First*, their roots, which absorb the soluble elements of the soil dissolved in water ; and, *second*, the leaves, which absorb by means of their stomata, and under the influence of air, light, and heat, the carbonic acid contained in the atmosphere. There is a constant relation between the absorption by the roots and the elaboration by the leaves, and it is upon this relation that fruit-bearing is based. Now, as the aim of all fruit culture is the production of fruit, it is natural that pruning, one of its factors, should be inspired by it. Leaves are indispensable to the life of a tree and to the production of fruit. But not only are the leaves indispensable ; they must also be in proportion to the richness of the elements furnished by the roots. Vigorous trees require a greater leaf surface than those less vigorous. Trees with tap-roots (for example, seedling pears) need more leaves than trees of equal vigour with surface roots, as, for example, pears grafted on the quince stock. So much for the principles ; but we have said before that there was a *tour de main* which is the skill of the practitioner, for in fruit-tree culture more than in any other, theory must be allied to practice, and *vice versâ*. The following operations, together with the means indicated elsewhere, will enable one to obtain or to re-establish “balance.”

DIRECTION OF THE BRANCHES.—Vertical branches are more favourably situated than oblique branches, and the latter than horizontal branches ; consequently a weak branch is raised in order to strengthen it, and a strong branch is turned down in order to weaken it. Strong branches are shaded in order to lessen the action of air, light, and heat ; an enfeeblement is thus obtained. The leaf surface is diminished by cutting the leaves in half, so as to abate their functions in the strong branches, and thus favour the weak ones. Fruit is preferably left upon strong and removed from weak shoots.

WINTER WORK consists of cleaning, removing useless shoots, pruning so as to secure proper form of tree, training, making transverse incisions above a bud to strengthen it, or a longitudinal incision to increase the size of the shoot, or, in the case of an unhealthy peach, to make the gum exude.

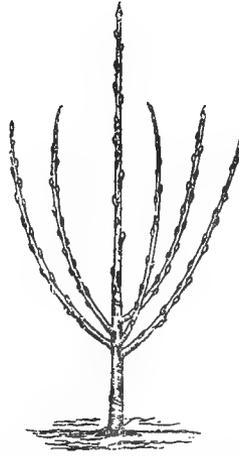
SUMMER PRUNING.—This has for its object the removal of useless shoots, thus causing the sap to be more equally distributed as well as admitting light

and air more regularly. It ought not to be done all at once upon the same tree; it should be commenced upon the stronger branches and higher parts. Old, weak, and languishing trees should first be summer pruned, and afterwards those that are young and vigorous.

PINCHING consists of stopping in their development the shoots which have surpassed the length assigned to them, in order to assure a good formation of buds at their bases. To pinch a shoot is to weaken it, therefore to secure balance one must begin with the strongest. How long the shoot ought to be when stopped depends upon the sort of tree and the variety. Shoots of plum and apricot trees are left longer than those of apple trees, and Bergamotte, Crassane, Beurré Diel, &c., pears are left longer than Louise Bonne, Winter



FIRST OR MAIDEN GROWTH
FROM GRAFT



PYRAMID PEAR TREE, TWO YEARS
OLD

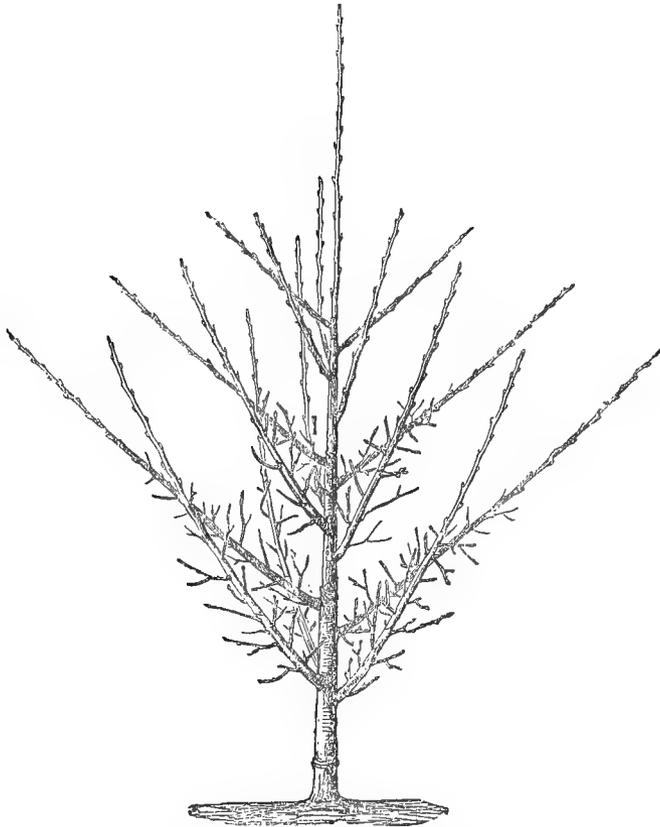
Doyenné, &c. The leading shoots of the principal branches are pinched late and but little. The practice of turning the extremity of a shoot back towards its base instead of pinching it is practised with new or rare varieties in order to increase the surface production.

ANNULAR INCISION.—This operation is practised especially upon the vine, below the bunches and before they flower. As a result the berries become larger and ripen sooner.

THINNING THE FRUITS.—Twenty individual fruits—pears, apples, or peaches—per square metre of tree are reckoned a good average. The thinning must be done early—as soon as the flowers have fallen, and again a little later. It has been remarked that in a bunch of pears the central fruits hold the better, while the reverse is the case with apples.

Pears and apples are often put in bags in order to avoid the ravages of insects. The bags are put on in June and July. They are made of paper and pierced with little holes, so as to allow the air to reach the fruits without giving access to insects. Grapes are put in bags to preserve them from wasps. These bags are of hair-gauze, light and oiled, or of wire-gauze.

Frequent syringings in the evening or the morning are very beneficial.

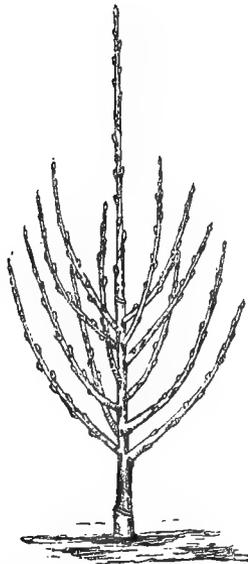


THE WINGED PYRAMID

FRUIT GATHERING.—Raspberries, gooseberries, cherries, plums, apricots, and other similar fruits are gathered when fully ripe. Peaches and nectarines may be gathered twenty-four or forty-eight hours before they are wanted for consumption. They should be gathered with great care, and must not be squeezed. The gathering of summer pears is best done eight days before they are wanted for eating, and that of autumn pears seven days before. Winter pears are gathered about the middle of October, according to the season of the year and

district. If gathered too soon, they shrivel; too late, they do not keep well. The gathering of grapes in the neighbourhood of Paris is done at the beginning of October. Choose good weather for this work.

PRESERVATION OF FRUIT.—Choose fine and healthy fruit. As for the place for storing, it must be wholesome, and have thick walls covered with squares of cork; it will thus be less subject to changes of temperature. Humidity is counteracted by having limestone, chloride of calcium, or alcohol placed about in flat



COLUMN-SHAPED PEAR TREE,
TWO YEARS OLD



A TYPICAL COLUMN-SHAPED
PEAR TREE

dishes. The temperature should be from 2 to 7 degs. centigrade. Light and air are factors which assist maturation; it is well, therefore, to restrict their influence.

PACKING.—Baskets or boxes (according to the distance the fruit is to be sent) are best. The materials employed should be light, inodorous, and bad conductors of heat.

PRINCIPAL FORMS FOR OPEN-AIR CULTURE

Of natural-growing (*i.e.* untrained) trees there are (of those on short stems) pyramids, spindle, and vase-shaped, and (on tall stems) the standard. Of trained trees the most important are the various palmate-shaped, U-shaped, vertical and

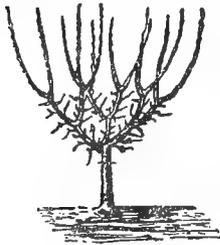
oblique cordons, double-U shaped and horizontal cordons (all on short stems), and the palmate on a long stem.

PYRAMID.—The ordinary pyramid, which consists of a stem bearing secondary branches in cycles of five, one above the other, is especially to be recommended for varieties of pears—with erect branches—for some sorts of apples, cherries, and plums. In order to obtain it, the scion is cut to an eye on the side opposite the graft at 0m.40 from the ground, reserving five “eyes” in order to obtain the first branches. Every year, to obtain a fresh series of branches, the stem is cut 0m.40 higher to a bud on the opposite side of the preceding cut. If growth is weak, a series of branches is taken only every two years. In this case the stem is cut back 10 or 11 centimètres above the last cutting, in the intermediate year; the bottom branches are cut so as to be one-third of the total height of the tree. The other branches will be proportionately shorter at the top of the spire.

In growing pyramids of two, three, or four stages there is nothing more to do than to continue the form, while taking care to assure the good growth of the shoots.

The winged pyramid is obtained in the same way; its branches are afterwards specially trained. They resist the wind better, but their formation is more costly.

SPINDLE OR COLUMN SHAPED.—This form, more slender and narrower than the pyramid, is suitable for small gardens and for the less vigorous varieties of pear trees. The first cut is made upon the maiden tree at 0m.70 or 0m.80 from the graft, and the others at from 0m.10 to 0m.30 above this, every year, according to the vigour of the tree. The secondary branches, which are much less numerous than in the pyramid, are cut at a length equal to a fifth or sixth of the total height, gradually diminishing in length towards the top of the tree.

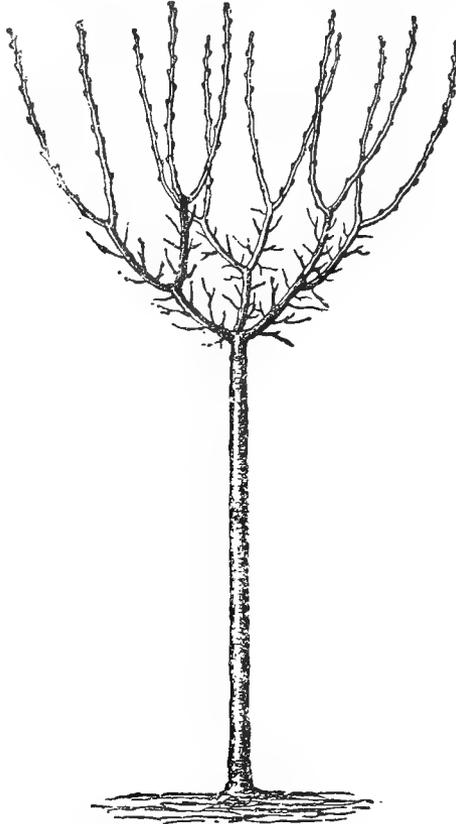


VASE-SHAPED APPLE
TREE

VASE OR GOBLET FORM.—This is especially useful for apple trees on the Paradise stock, and also, in a less degree, for those on the Doucin. In order to obtain it, the scion is cut at from 0m.30 to 0m.40 from the ground, leaving three buds from which one endeavours to obtain three branches equally distant from each other and from the centre. Each of these is cut in the second year to two buds, in order to obtain six branches, which in the third year, being again cut to two buds, will give the twelve branches required. Let us add that the Paradise stock is rarely vigorous enough for one to obtain this regularity; however, a standard to work by is necessary.

THE STANDARD.—This form is especially suitable for orchards, although well-trained standards make pretty avenues in fruit gardens. In order to form the head, leave only three of the best or best placed branches; these are shortened the first year to a length of from 10 to 20 centimètres, according to their strength. On some “stone” fruit trees a greater length of shoot should be left—for instance, the cherry, which requires as much as 0m.30. Apricot shoots, on the contrary, are left shorter. Each branch should be cut back close to its base,

then very vigorous growths result, which are left longer in succeeding years in order to form the frame. It is almost the same with plums and peaches, which usually grow strongly the second year. We would observe that trees with high stems are only pruned during the first five or six years, when one endeavours to make them of good and well-balanced shape, generally that of a vase or funnel, for these forms admit plenty of air to the middle of the tree, a condition essential



STANDARD VASE-SHAPED PLUM TREE

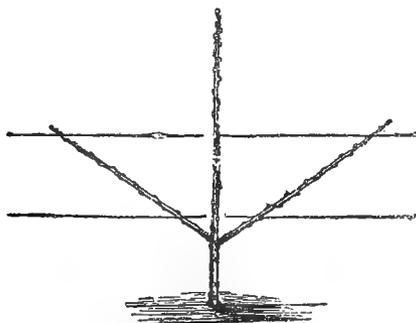
to fruitfulness. The apricot, however, is an exception, for it requires to be constantly cut back on account of its tendency to cease producing at the base of its branches and to bear all its fruit at the extremities.

VARIOUS PALMATES.—The palmate is the type *par excellence* of the trained forms. It consists of an axis with oblique, horizontal, or vertical branches on either side. All these variations are obtained in the same way by cutting the maiden to three buds at om.30 or om.35 from the ground, for all kinds except

THE FRUIT GARDEN

the peach, which should be cut at from om.40 to om.50. Of these three buds the terminal one should be on the same side as the graft swelling, and the other two should be on the right and left.

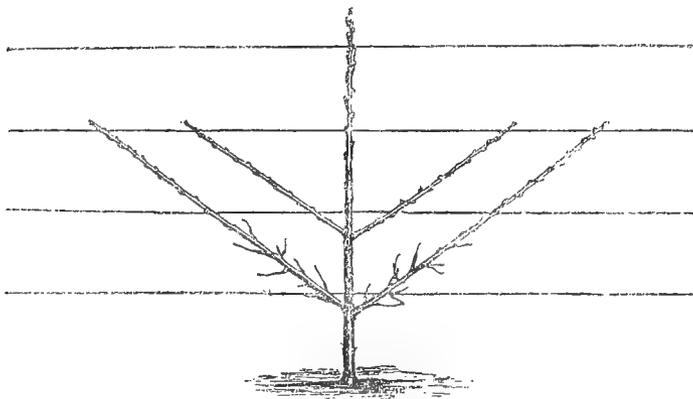
The stem should then be successively cut, for the peach at om.5, and for



FAN-TRAINED (PALMATE) PEAR TREE SHOWING FIRST SERIES OF BRANCHES

other kinds at om.30 above the last series produced similarly. Except where the established branches are thought not to be sufficiently strong, a series is taken each year.

In order to form palmates with a double stem, a beginning is made by

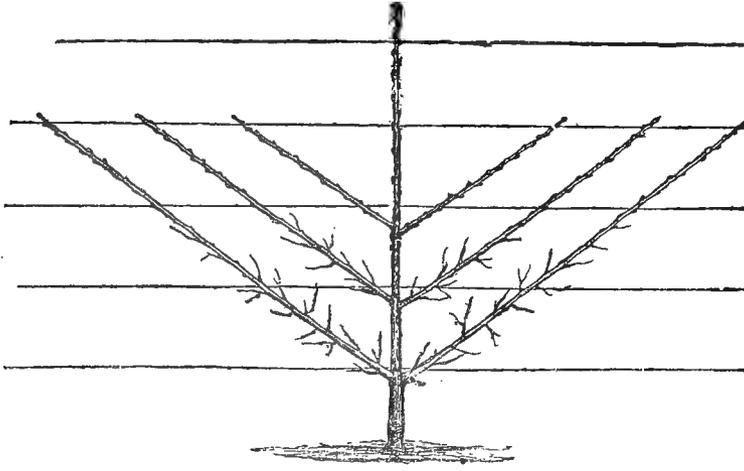


FAN-TRAINED (PALMATE) PEAR TREE WITH TWO SERIES OF BRANCHES

obtaining a U at om.20 from the ground, and then proceeding as with a single stem—the first branches beginning at om.10 or om.30 from the ground. The union of the palmate with oblique branches and that with horizontal branches constitutes the popular Cossonet form.

Finally, nothing is more easy than to transform a palmate with oblique

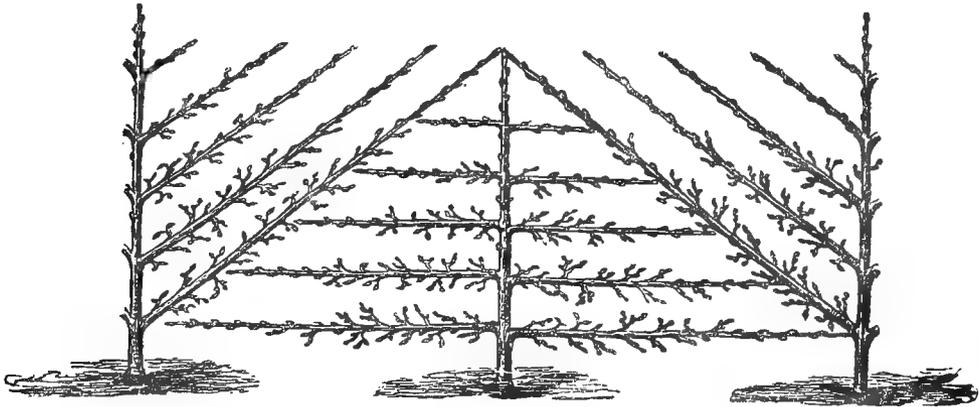
branches into a palmate with horizontal or even vertical branches, by operating upon the long and flexible shoots during warm weather, when they are full



FAN-TRAINED PEAR TREE WITH THREE SERIES OF BRANCHES

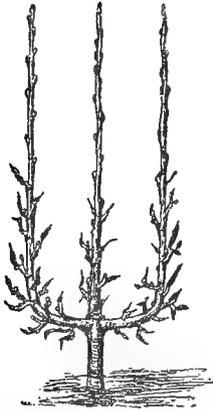
of sap. The best palmate is still the Verrier, either among the forms with an even or uneven number of branches.

The Candelabrum and the square forms are fast disappearing.

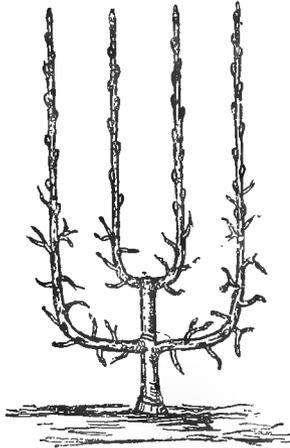


"COSSONET" FORM OF FAN-TRAINING

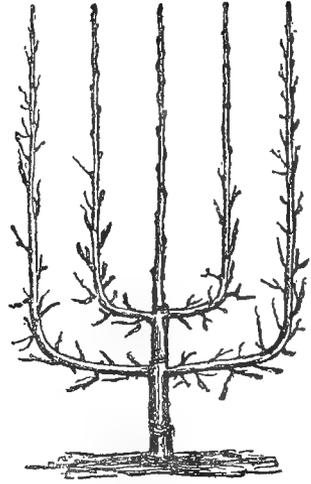
U AND UU (DOUBLE U) FORMS.—The U-shape suits trees which are not very vigorous, are in poor land, or those for high walls. It is obtained by cutting the maiden to two buds at om.30 (for the peach at om.40 to om.50)



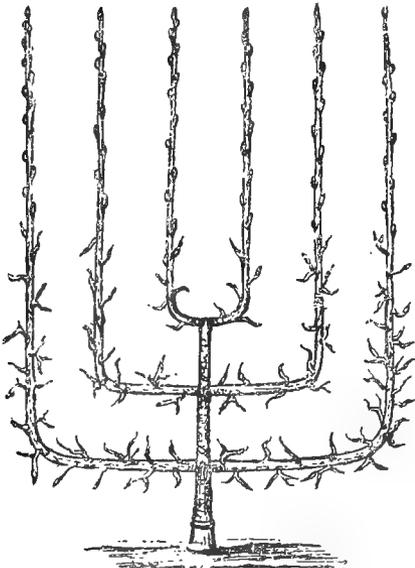
THE "PALMETTE VERRIER"
PEAR TREE WITH THREE
BRANCHES



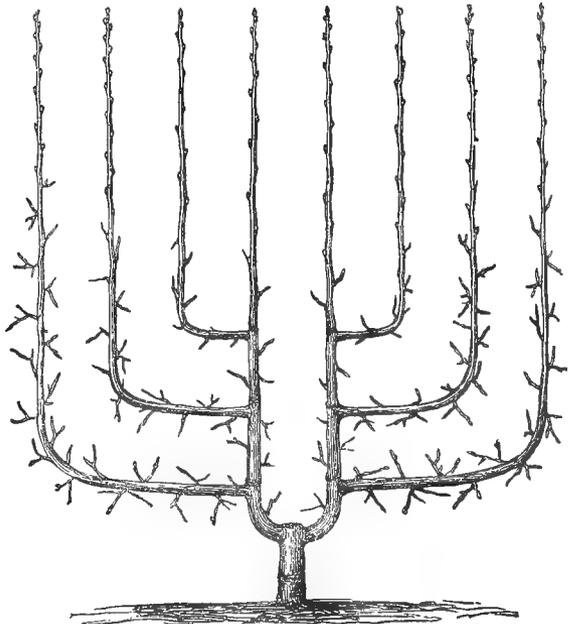
"THE PALMETTE VERRIER"
WITH FOUR BRANCHES



THE "PALMETTE VERRIER"
WITH FIVE BRANCHES

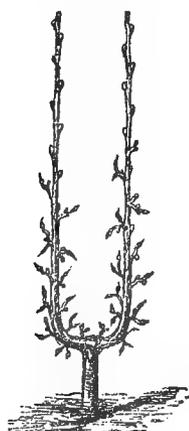


THE "PALMETTE-VERRIER" WITH
SIX BRANCHES

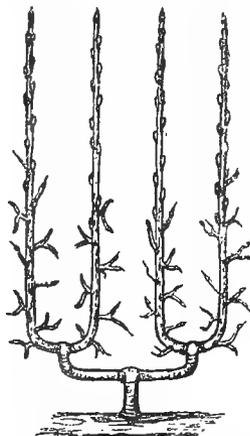


THE DOUBLE-STEMMED "PALMETTE-VERRIER" PEAR TREE
WITH EIGHT BRANCHES

from the ground. Each of the shoots is trained horizontally, and then raised upwards at a distance of om.10 (the peach at a distance of om.20) from the axis, in order to form the two arms of the U. There is nothing else to do except to train the branches successively, and to secure a good growth both right and left. For the double U, which is the symmetrical form *par excellence*, cut the maiden to two buds at om.20 (the peach at om.30) from the ground. Train the two shoots horizontally, and raise them om.30 (the peach at om.50) from the axis; then cut them back to two buds om.10 or om.12 above the horizontal branch (the peach at om.18 or om.20), in order to obtain shoots



U-SHAPED PEAR
TREE



U U (DOUBLE U) FORM
OF TRAINING

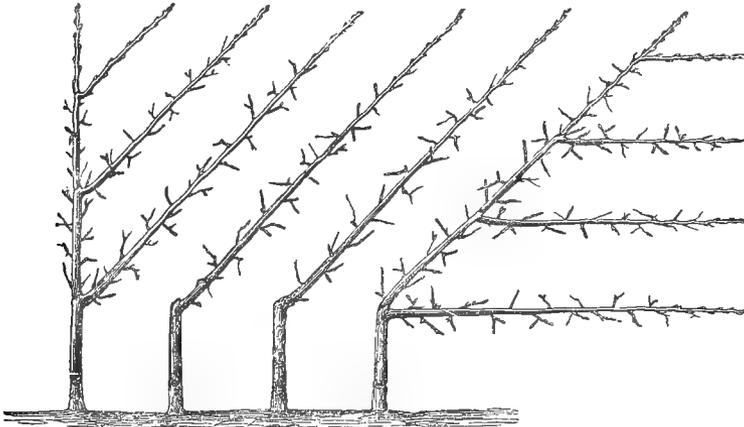
for the frame, that is, the two branches of the U. The U and the double U forms fruit freely.

THE VERTICAL CORDON.—This is only used for covering very high walls or pillars. It is also used for varieties which are not very vigorous, especially in small gardens where there is but little space. Cut back the stem each year according to its vigour. The distance apart for planting is om.40.

OBLIQUE CORDONS.—These are particularly suited to small gardens, for the reason that they are easily formed and permit of a great number of varieties being grown in a given space. The oblique cordon is also useful for sloping land, for poor soils, and for non-vigorous growing varieties. Finally, if a tree should perish, it does not leave a large gap, and can easily be replaced even by training in the branch of its neighbour.

Oblique cordons, with the exception of those at either end of the wall or fence, have one stem only. There are no branches other than the short fruit spurs. All incline in the same direction on the wall, at an angle of about 60 degs., from the horizontal, towards the south if they are planted on walls facing east or west, and towards the east if on a south wall. On sloping ground this rule is disregarded, and the trees are trained in the direction of the

ascending incline. The angle can be still further reduced, which will allow a greater length of stem if the walls are not so high. It is easy to understand that



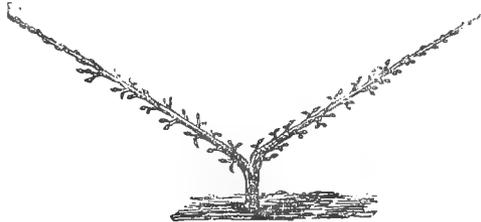
PEAR TREES AS OBLIQUE CORDONS, SEMI-FAN-TRAINED AT EACH END

the more pronounced the incline the farther apart the trees ought to be, for an increased incline of the stems reduces the distance between them. For trees with stems at an angle of 60 degs., the distances between them should be—for



DOUBLE AND SINGLE HORIZONTAL CORDON APPLE TREES, USEFUL FOR PLANTING AT THE EDGES OF BORDERS

peaches, 1 m.; plums and cherries, 0m.80; and for pears upon the Quince stock, and apples upon the Doucin stock, and apricots, 0m.60.

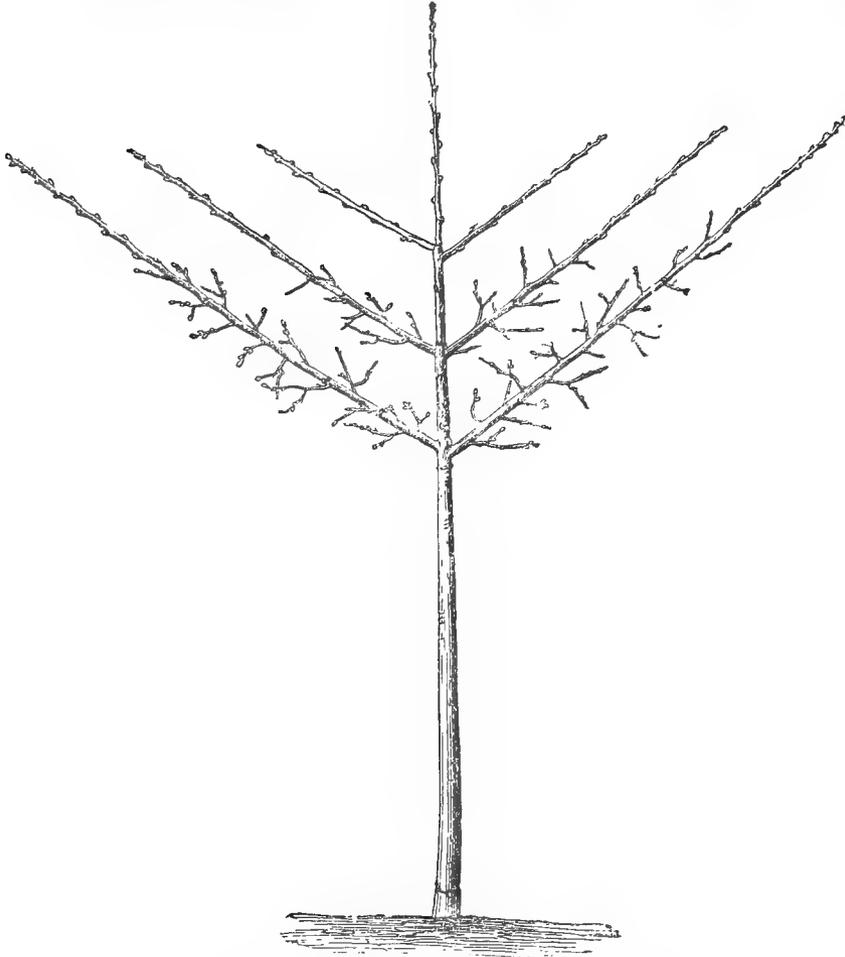


V-SHAPED APPLE TREE

By planting several trees of this form together, so that the branches cross, the network training is obtained.

HORIZONTAL CORDONS.—The apple on either Paradise or Doucin stocks, as well as some varieties of pear upon the Quince, do very well as horizontal

cordons at 0m.40 from the ground, and planted at the edge of a border. For this form an iron wire fixed to two posts, strengthened by supports as shown in the accompanying figure, is sufficient. Apples on the Paradise stock are



STANDARD FAN-TRAINED PEAR TREE WITH THREE
SERIES OF BRANCHES

planted from 3 to 4 mètres apart; apples on the Doucin and pears on the Quince at from 4 to 5 mètres apart. Each tree has only two branches, opposite to each other. These are trained along the iron wire. By allowing one branch only to grow, and training it to the wire, a single horizontal cordon is obtained.

Cordon trees are easily managed. The chief thing to do is to have a good length of stem, and during growth, to pinch the shoots slightly and repeatedly. Generally speaking, trees thus treated take up but little room, bear more quickly than others, and give better coloured fruits. All varieties of apples do well as horizontal cordons, but of pears only those varieties which bear fruit freely and are not vigorous must be chosen. Horizontal cordons of pears, and apples, with one or with two branches, at 0m.80 from the ground, are also used to cover low walls, or to make a double row with those at 0m.40 from the ground in rather large borders.

V-SHAPED TREES.—By training an apple or a pear tree so as to form the letter V, a practicable form and one favourable to fruitfulness is obtained. Young trees are planted at distances varying according to the height of the trellis and the vigour of the variety. With a fence or trellis 1m.20 high, and the trees 0m.80 apart, each arm is 2 mètres long, and forms an angle of 35 degs. with the ground. With a high trellis it would be well to plant the trees closer; with a lower trellis, good soil, and a vigorous variety, they should be planted farther apart still.

THE TRAINED STANDARD.—This form, which is obtained like any other fan-trained tree, as soon as the stem is of the desired height, is used for covering the upper parts of very high walls or houses while leaving the lower part free—for example, between two windows. The stem, without being in the way, easily finds room, and spreads its branches above. This is a lucrative way of covering one's house.

FRUIT TREES AND THEIR CULTURE

THE APRICOT

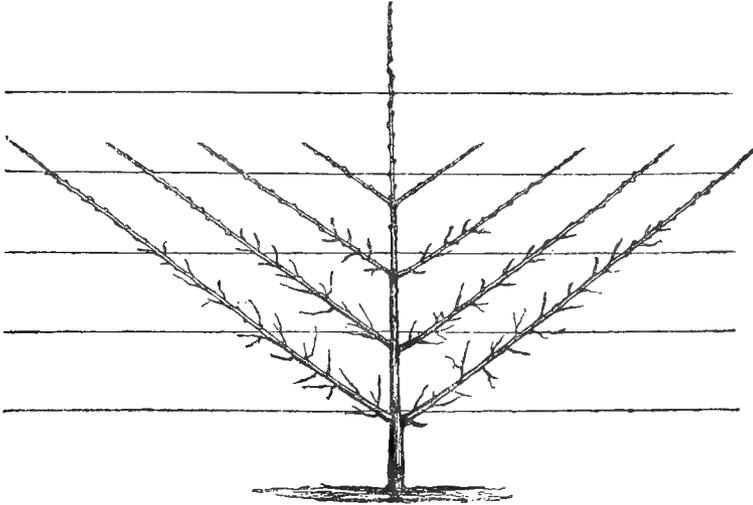
The apricot, on account of its early flowering, should be planted where spring frosts are not to be feared. It requires a situation sheltered as much as possible from the north wind.

Light and warm soils suit the apricot better than those which are heavy and damp.

PROPAGATION.—In the south of France the apricot is grafted upon the almond, or seedling apricot, but in the neighbourhood of Paris and the west of France it is better grafted upon the St. Julien plum or the damson. It may be grown either as a standard or palmate, but from trees of the latter form the fruit is not so good. In order to obtain a stem recourse is had to an intermediate stock. This varies with the locality: in Anjou the St. Julien, or Gvr. d'André Leroy, is used; in Paris the St. Julien, Krazenski, &c.

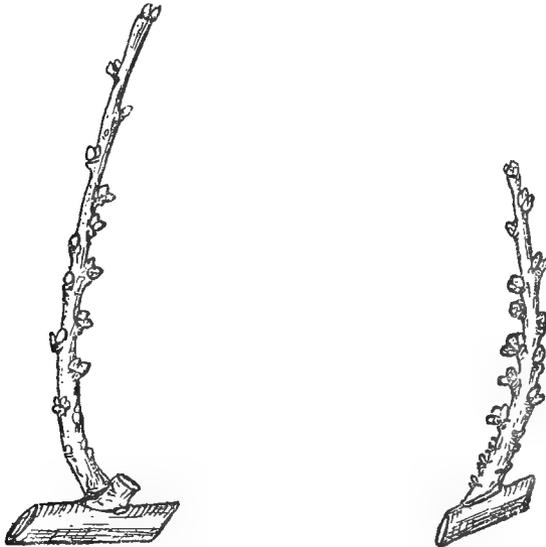
In all cases the intermediate stock is first grafted upon the St. Julien. The fruit of the apricot is of considerable market value, and therefore, as we have said, much grown. Around Paris, at Triel, Dijon, Lyons, Clermont Terraud, Avignon, Bordeaux, &c., bush or half-standard trees are grown.

PRUNING.—The apricot bears its fruit upon the shoots of one year's growth,



FAN-TRAINED APRICOT WITH FOUR SERIES OF BRANCHES

or upon spurs; this will suggest the pruning required. The growing shoots



TYPICAL SHOOTS OF THE APRICOT BEARING WOOD BUDS AND FRUIT BUDS

are stopped at the third, fourth, fifth, or sixth leaf according to the vigour of the tree. Apricots are eaten fresh, dried, or preserved.

VARIETIES.—The following varieties are those most generally grown :—

DEFARGES.—*Fruit* rather large ; July, August.

GROS COMMUN (Large Ordinary).—*Tree* very vigorous and fertile, spreading ; *fruit* oval, whitish yellow, and speckled golden brown on the sunny side, excellent for preserving ; end of July.

JACQUES.—*Tree* rather vigorous, very fertile ; *leaves* small ; *fruit* medium-sized, flat-ovoid, pale yellow, shaded grey ; middle of August.

LIABAUD.—*Tree* vigorous, not very fertile ; *leaves* large ; *fruit* globular, straw-coloured and orange carmine on the sunny side ; July.

LUIZET.—*Tree* vigorous, fertile ; *fruit* large and sweet ; end of July.

PÊCHE (Pêche de Nancy).—*Tree* vigorous, very fertile ; *leaves* large ; *fruit* large, oval, yellow carmine where exposed to the sun ; end of August.

PRÉCOCE DE BOULBON (De Boulbon).—*Tree* vigorous, very fertile ; *leaves* large ; *fruit* large, oval, yellow carmine on the sunny side ; beginning of July.

PRÉCOCE DE MONPLAISIR.—*Tree* very vigorous, not fertile ; *fruit* rather large, orange yellow, purpled where exposed to the sun ; beginning of July.

PRÉCOCE D'ESPEREN (Esperen).—*Tree* very vigorous, not very fertile, spreading ; *leaves* very large ; *fruit* rather large, oval, straw yellow, intensified on the sunny side ; July.

ROYAL (Royal de Wurtemberg).—*Tree* vigorous, very fertile ; *leaves* medium-sized ; *fruit* large, globular, flattened, yellowish white and orange yellow, purple on the sunny side ; end of July, August.

SUCRÉ DE HOLUB.—*Tree* moderately vigorous, fertile ; *leaves* rather large, rounded ; *fruit* large, rounded-ovoid, orange yellow and red, marked with purple on the sunny side ; August.

The most useful varieties for commercial purposes are :—Gros Commun, Liabaud, Précoce de Boulbon, Pêche, Royal.

THE ALMOND

The almond requires rather a high temperature to ripen its fruit ; its very early blossoming also renders it liable to injury from the spring frosts. It does best in the south and west of France. Around Paris green almonds can be obtained by planting in sheltered situations. Dry and deep land is most favourable to its fertility.

PROPAGATION.—In the south of France it is grafted upon the almond, but in the vicinity of Paris the St. Julien plum suits it much better. It is best grown as a standard. It needs but little pruning, and that more for the sake of symmetry.

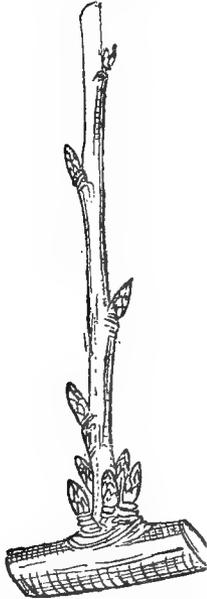
VARIETIES.—The best varieties for amateurs are Soft Shelled and La Princesse ; they are ripe in July. For market culture these two varieties are grown, as well as Ronde Fine. The gathering of almonds takes place in August and September. They are used in cookery, &c.

THE CHERRY

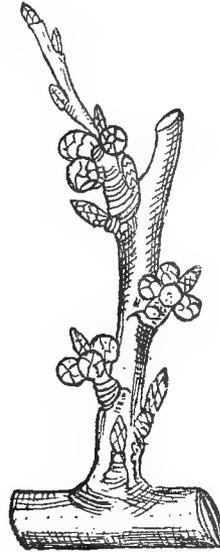
The cherry likes an open situation with a mellow soil ; it greatly dreads an excess of moisture. It is found wild more or less throughout France, but less frequently near the sea. It is grown in gardens in pyramid, vase, and palmate

forms, and especially as a standard. For commercial cultivation it is planted in open fields, bushes at 5 mètres, or standards at 8 mètres apart; sometimes when other plants are grown between the trees, these are at a still greater distance apart.

PROPAGATION.—By grafting upon the wild cherry; the Ste. Lucie cherry is reserved for half-standard or other short-stemmed forms, and sometimes in dry and hot soils for standards. The cherry is largely grown in Var, the delta of



ONE-YEAR-OLD SHOOT OF
CHERRY



TWO-YEAR-OLD CHERRY SHOOT
THAT WILL BEAR FRUIT

the Rhone, Lyonnais, and the environs of Paris. In the east of France it is much cultivated for the manufacture of "Kirsch."

PRUNING.—The cherry tree bears its fruit upon spurs and shoots of one year's growth. Little pruning, stopping, or disbudding is necessary, only sufficient to balance the tree.

There are five distinct sorts of cherries :—

BIGARREAU.—*Flesh* crisp, sweet; *juice* almost colourless; *branches* vigorous, long and few, often divergent; *flowers* large, half-opened.

CHERRIES (properly so-called).—*Flesh* tender, sugary; *juice* almost colourless; *branches* many, medium size, erect, or divergent; *flowers* medium size, very open.

GUIGNE.—*Flesh* soft, sweet; *juice* often coloured; *branches* the same as in the Bigarreau; *flowers* large, half opened.

GRIOTTE.—*Flesh* tender; *juice* clear, acid, sometimes astringent and slightly bitter; *branches* rather slender, numerous, and divergent.

CHERRIES FOR KIRSCH.—Special varieties for distillation.

THE BEST CHERRIES

BIGARREAU

D'ESPEREN.—Moderately fertile; *fruit* isolated, very large, yellowish and red on the sunny side; *flesh* pink white; mid-June.

GROS CŒURET (Cœur de Pigeon).—Moderately fertile; *fruit* in pairs, very large, rosy yellow; *flesh* yellow; mid-June.

JABOULAY.—Moderately fertile; *fruit* in threes, large, purple red; *flesh* brownish red; end of May.

JAUNE DE BUTTNER (Buttner's Yellow).—Fertile; *fruit* in threes, medium size; *flesh* yellowish; end of June.

NAPOLEON.—Very fertile; *fruit* in pairs, very large, pinkish red; *flesh* whitish; mid-June.

PELISSIER.—Very fertile; *fruit* very large, deep red; *flesh* blood red; end of May and early June.

REVERCHON.—Moderately fertile; *fruit* in pairs, rather large, bright red; *flesh* pinkish white; mid-June.

CHERRIES (TRUE)

ANGLAISE HÂTIVE (Early Royal, May Duke).—Very fertile; *fruit* in bunches, large, deep red; *flesh* garnet red; beginning of June.

BELLE DE MAGNIFIQUE (Belle de Chatenay, Belle de Sceaux).—Moderately fertile; *fruit* in pairs, garnet red; *flesh* red, rather tart; end of July.

BELLE DE CHOISY (Belle Audigeoise, Ambrée).—Moderately fertile; *fruit* in pairs, large, amber-coloured; *flesh* yellowish; end of June.

HOLMAN'S DUKE (Archduke, Late English).—Very fertile; *fruit* in pairs, large, brownish red; *flesh* pinkish white; mid-July.

IMPERATRICE EUGENIE.—Fertile; *fruit* large, round, deep crimson; *flesh* yellowish; beginning of July.

MONTMORENCY, *Short-stalked* (Gros Gobet).—Not very fertile; *fruit* in pairs, large with developed furrow, very short stalk, brown red; *flesh* transparent; end of June, July.

MONTMORENCY, *Long-stalked* (Amarelle-Royale).—Moderately fertile; *fruit* single, globular, bright red; *flesh* whitish yellow, rather acid; end of June, July.

MONTMORENCY DE BOURGUEIL.—Not very fertile; *fruit* in pairs, large, globular, bright red; *flesh* whitish yellow; end of June.

MONTMORENCY DE SAUVIGNY.—Very fertile; *fruit* single or in pairs, rather large, red; *flesh* orange rose; end of July.

MORELLO DE CHARMEUX.—This is a late Belle de Magnifique; ripe August–September.

REINE HORTENSE.—Not very fertile; *fruit* single, very large, oval, clear red; *flesh* yellowish; beginning of July.

ROYALE (Royale de Hollande, Duke Cherry).—Moderately fertile; *fruit* in pairs, large brown red; *flesh* pink; beginning of July.

GUIGNE

A GROS FRUIT-NOIR (Early Black).—Moderately fertile; *fruit* in threes, cloudy red; *flesh* garnet-coloured; beginning of June.

BEAUTÉ DE L'OHIO (Ohio Beauty).—Moderately fertile; *fruit* in pairs, globular, reddish yellow; *flesh* yellowish; mid-June.

BELLE D'ORLÉANS.—Very fertile; *fruit* in pairs, large, rosy white; *flesh* pink; end of May, beginning of June.

DE MAI (d'Annonay).—Very fertile; *fruit* in pairs, brown red; *flesh* garnet red; end of May.

ELTON.—Fertile ; *fruit* in bunches, large, yellowish, marbled with pink ; *flesh* whitish ; July.

PRÉCOCE RIVERS (Early Rivers).—Fertile ; *fruit* large, red ; *flesh* pink ; end of May.

RAMON OLIVA.—Very fertile ; *fruit* large or very large, black red, sweet, perfumed, very good ; end of May, beginning of June.

GRIOTTE

DU NORD.—Very fertile ; *fruit* in bunches, oval, black red ; *flesh* garnet red ; August-September.

KIRSCH CHERRIES

NOIRE DES VOSGES (Béchat).—Very fertile ; *fruit* rather large, rounded, heart-shaped, deep black ; *flesh* black, good quality ; end of June, July.

ROUGE DES VOSGES (Vinette).—Extremely fertile ; *fruit* in pairs, generally rather large, long, heart-shaped, deep crimson red ; *flesh* white, good quality ; mid-July.

THE BEST COMMERCIAL VARIETIES

Guigne de Mai, *Bigarreau Jaboulay*, *Bigarreau d'Esperen*, *English Cherry*, *Impératrice*, *Belle de Magnifique*, *Griotte du Nord*, *Bigarreau Reverchon*, *Bigarreau Napoléon*, *Early Black Guigne*, *Montmorency (long-stalked)*, *Montmorency (short-stalked)*, *Noire des Vosges*, *Rouge des Vosges* (for Kirsch).

THE CHESTNUT

The chestnut flourishes in the mountainous regions of Brittany, La Vendée, Périgord, Berry, Morvan, and especially Auvergne, Limousin, and Dauphiné, in sandy, granitic, ferruginous, or other soils, provided they are light. The best aspect is facing east, sheltered from the north winds. Sharp frosts, as in 1880, do much harm to the chestnut ; spring frosts also sometimes damage the flowers.

PROPAGATION.—The chestnut is grafted upon the wild chestnut. It is grown as a standard and pruned but little. The fruit is borne upon wood of one year's growth when the tree is eight or ten years old.

VARIETIES.—The best varieties are Marron de Lyon, Marron de Luc, and Marron de Lusignan. For commercial purposes each district grows its own sorts, which differ very little from each other.

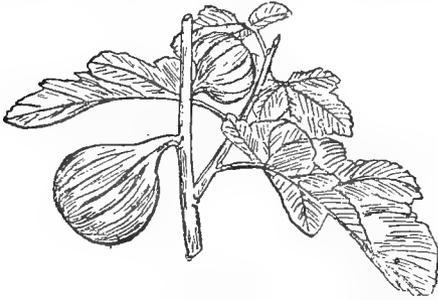
The chestnut is eaten when cooked in water or roasted ; it is also used in confectionery, &c.

THE QUINCE

The quince grows well throughout France, except in dry situations or near the sea ; it is quite hardy. It will flourish in almost any soil that is not water-logged and does not contain an excess of lime. The quince is cultivated by the amateur for home use. From the commercial point of view its fruit is grown for preserves, liqueurs, &c. It is grafted upon the Fontenay quince. The varieties most commonly grown are the Angers and the Portugal.

THE FIG

The fig is grown in the west and south of France in the open air. In the neighbourhood of Paris it needs a wall or a sheltered situation and a warm soil, as at Argenteuil. Here it also must have protection in winter by covering with straw. Warm and light land best suits the fig. The amateur who may have but little room should place it in the warmest corner of the garden. When grown for commercial purposes the plants are placed 4 mètres apart in the row, with 3 mètres between the rows. The fig is propagated by layers; the shoots will root the same year as layered.



PART OF FIG BRANCH (PINCHED), SHOWING
FRUIT AND SUCCESSIONAL SHOOT

of the previous year, except one or two at the base; secondly, in removing the wood which has borne fruit immediately after the spring gathering.

VARIETIES.—The best are:—The *White Fig*, the *Violet Fig*, *La Barbillonne*, *La Dauphine*, *La Rouge de Bordeaux*. Each district has its own commercial varieties. Figs are used fresh, for preserving or for confectionery. They are largely grown in Bordeaux, Provence, the Western littoral, Brittany, and Argenteuil.

PRUNING.—This consists, firstly, in removing all the wood buds upon shoots

THE RASPBERRY

Raspberries are not fastidious as to situation or soil. In order to have an abundance of good fruits it is well to avoid very hot and also shaded situations, as well as excessively dry soils. Propagation is effected by means of one-year-old suckers. These are taken every year from clumps in full bearing. Each clump should have no more than six stems in order to produce the finest fruits and a continuous crop.

PRUNING.—The second crop of fruits in August and September is borne upon the shoots of the same year, and for the spring crop upon the wood of the preceding year. Every year, therefore, in winter the wood which has produced fruit in spring, and which is dead, must be removed. The best growths of the year must be selected, and upon these will be pro-



FRUITING SHOOT OF RASPBERRY

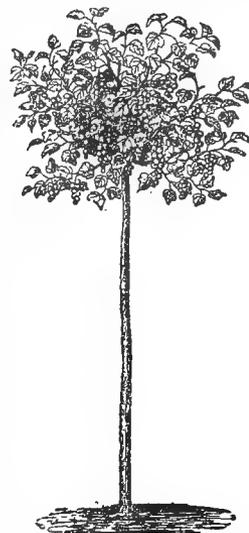
duced fruit the next spring. The commercial cultivation of the raspberry is carried on extensively in the neighbourhood of Paris at Bagnole, Montreuil, Fontenay, Bourg-la-Reine, Sceaux, Verrières, &c. ; in Burgundy at Dijon ; and in Lorraine at Lunéville, &c. The first crop is ripe in June, and the second in September and October. Remove the first flowers in order to procure a better crop later on. Raspberries are eaten raw, or used in confectionery, ices, liqueurs, &c. The varieties most commonly grown are :—*Fastolf*, *Horner*, *Pilate*, with red fruits ; *Orange de Binkle*, with yellow fruit. Autumn-fruiting varieties—*Merveille des Quatre Saisons*, *Belle de Fontenay*, with red fruit ; *Sucrée de Metz*, *Surprise d'Automne*, with yellow fruit.

THE CURRANT

Currants prefer a situation partly shaded to one exposed to the full sun. Light rather than stiff soils are best for them. The currant is often grown in the worst position in the garden. This certainly lessens its value, for the fact must not be lost sight of that although certain fruits require less than others, there is a minimum of requirement which must not be passed. Currants may be cultivated in beds and borders, the bushes being 1 mètre distant from each other, or trained fan-shaped.

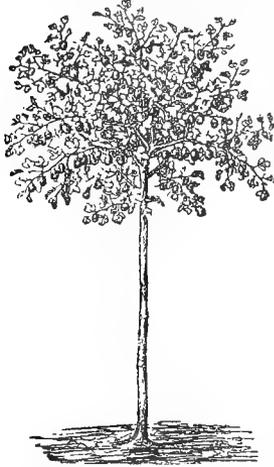
PROPAGATION.—Currants are increased by taking cuttings in winter, or by layers in spring. For commerce the currant is cultivated in bush form, but the amateur can, as we have said above, train it fan-shaped on iron-wire trellises, or have it upon short stems, or again on a higher stem (1 mètre) by grafting upon *Ribes aureum*. Palmate-trained plants give the finest fruit, but it is perhaps hardly worth while to train them thus. Standards and half-standards are very decorative. The fruit is good, easy to gather, and never soiled by the splashing of rain. The life of such plants, however, is short, while grown as bushes one may have currants in full bearing for forty years, provided they are well manured every three years.

PRUNING.—Currants bear fruit on branches one year old or on spurs of the same age, which are formed every year on shoots of the preceding year. It is necessary, therefore, to secure shoots of one year's growth in order to maintain the vigour of the tree and the quality of the fruit. The fruits of the currant are eaten fresh, or may be iced, preserved, &c. The best varieties are :—*La Versailles*, *Hâtive de Bertin*, *Fay's New Prolific*, with red fruit ; *Hollande*, *La Versailles Blanche*, with white fruit. Currants are grown in quantities at St. Denis, Sannois, Epinay, Montmorency, Verrières, Chatenay, Sceaux, Fontenay, Bagnole, Lille, Nancy, and more or less in all parts.



STANDARD CURRANT

THE BLACK CURRANT.—The common black currant and the variety *Noir de Naples* are cultivated for the liqueur, notably in the neighbourhood of Dijon, Beaune, Chagny, Pantin, Sceaux, Mantes, Vernon, Langres, &c.



STANDARD GOOSEBERRY
IN FRUIT

THE GOOSEBERRY.—The gooseberry is not much cultivated in France except in the neighbourhood of Dunkirk. The most common varieties are:—*Maraby King*, *Whitesmith*, *Golden Drop*, *Early Grosse Rouge*, *Late Grosse Rouge*, *Smiling Beauty*, *Ocean*, *Winham's Industry*. Gooseberries are eaten raw, and in numerous preparations and preserves.

THE MEDLAR

The medlar may be planted in almost any land and any situation. With a few exceptions the medlar is grown more by amateurs than for market. The forms best suited to it are the standard and the bush; it requires little or no pruning. The fruit is borne at the ends of young shoots which spring from branches of one year's growth. The medlar is increased by grafting upon the thorn. The fruit is eaten when almost rotten. The two varieties most usually met with are the Common, and that called the Large Dutch Medlar.

THE HAZEL NUT

The hazel nut will grow in almost any position, even under large trees, and any soil. It is nevertheless well to point out that hot situations render the fruit unsound, and that an excess of moisture or of shade lessens its fertility. The fruit is borne on young shoots which spring from wood of one year's growth. Cultivated both for ornament and production in the garden of the amateur, it is also grown, chiefly for market, in Provence, Auvergne, Brittany, Anjou, and the Pyrenees. The hazel nut is increased by layers. The best varieties are:—*Aveline* (red, round), *Aveline* (white, long), *De Trebizonde*, *Merveille de Bollwiller*.



PART OF BRANCH OF HAZEL NUT WITH
FRUIT AND CATKINS

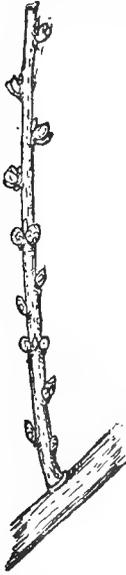
THE WALNUT

The walnut dreads severe winter frosts, and the sudden chills of spring often injure its flowers; it is therefore prudent to avoid wet land, for there the frost is usually most severe. A rather light

soil and a sheltered situation suit the walnut best. The walnut, with rare exceptions, begins to bear fruit at eight or ten years of age. It is grown as a standard in orchards, and is increased by sowing seed or by root grafting. Walnuts for the market come chiefly from Dordogne, Isère, Corrèze, Puy de Dôme, Haute Saône, Anjou, Cher, Savoy, &c. The nuts are eaten fresh or dry. Oil and liqueurs are also made from them. The best are the *Common Walnut*, *Soft-shelled Walnut*, *De la St. Jean Walnut*, *Bijou*.

THE PEACH

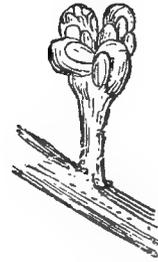
The peach, in order to live long and to bear regular crops of good fruit, requires heat. In the south and west, and in certain favoured districts in the centre of France, it is cultivated in the open air, but in the neighbourhood of Paris, with very rare exceptions, and especially in the east and north, it must



SHOOT OF PEACH, SHOWING WOOD BUDS AND BLOSSOM BUDS



PEACH SHOOT WITH BLOSSOM BUDS

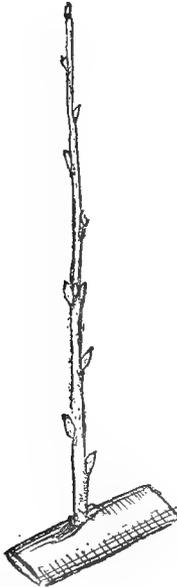


SHORT CHARACTERISTIC GROWTH, BEARING BLOSSOM BUDS

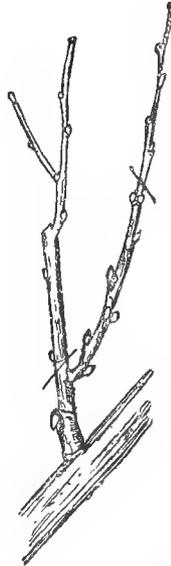
be grown upon an east or south wall, and, moreover, must be protected from frost when in flower by canvas or by other means. Wet and unærated soils are harmful to the peach; in such it is very liable to "gum."

PROPAGATION.—The peach is increased by budding upon the seedling peach in the south of France, and upon either the almond or St. Julien plum in the centre, west, and north, according to the soil. The Almond stock gives more vigour and suits the deeper and warmer soils; the plum, on the contrary, suits damp and shallow soils.

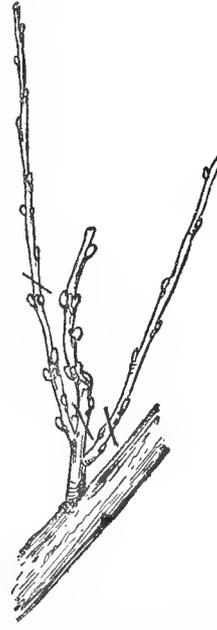
FORMS OF TREES.—For open-air culture the peach is grown as a bush or upon short stems. Upon walls the peach can be grown in trained forms—U or double U, oblique cordons, with three, four, five, or six branches. It is right, however, to remark that this work is long and costly and is only suitable for



PEACH SHOOT WITH
WOOD BUDS ONLY



METHOD OF PRUNING THE PEACH PRACTISED WHEN THE SUCCESSIONAL SHOOT HAS BOTH WOOD BUDS AND BLOSSOM BUDS



PRUNING THE PEACH TREE SO AS TO OBTAIN A FRUITING SHOOT (SUBSEQUENTLY CUT AWAY) AND A SUCCESSIONAL SHOOT

the garden of the amateur. For market culture and in cold districts it is often better to restrict the trees to the fan-shape. If any branches perish their places can easily be filled.

PRUNING.—The peach bears fruit upon branches of one year's growth, so that each year fresh shoots must be trained in and old wood removed to make room and to prevent overcrowding. Fruiting shoots are distinguished as follows: Those of average size bearing both wood-buds and fruit-buds, weak shoots with flower-buds and a wood-bud at the extremity only, and short growths with several flower-buds and one wood-bud. As to the pruning, let us first examine the pruning of a two-year-old branch. The object is to get fruit and to introduce a new shoot for the following year. The strongest shoots and also those with all wood-buds (unless they are weak) are cut back;

the short and weak shoots with flower-buds and a terminal leaf-bud are left alone. To leave a branch unpruned is to strengthen it, to cut it short is to weaken it; and this is the reason why, even against all theories, we cut back vigorous shoots closely. Where there are strong shoots which do not fruit, there are often also weak ones that give but little fruit, and from which it is always difficult to obtain good successional shoots. By cutting back strong growths we divert the flow of sap from them to the weaker ones, and so make these strong. In a word, it is necessary always to treat each part of the tree according to its needs and in relation to the needs of other parts, so as to



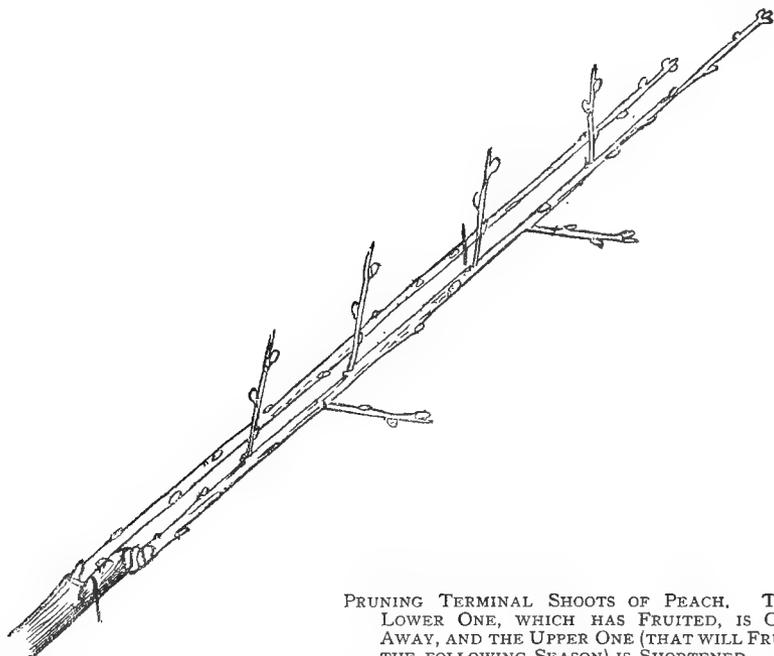
A SHOOT OF THE PEACH, STOPPED OR PINCHED TO ASSIST THE DEVELOPMENT OF THE FRUITS AND THE PRODUCTION OF SUCCESSIONAL GROWTHS

preserve the balance throughout. Wood that has borne fruit should be removed, and the shoot for next year's fruiting trained in to take its place; this in its turn will also produce a shoot to bear fruit the succeeding year. When shortening a shoot always cut to a wood-bud, not to a fruit-bud (the former are more elongated than the latter), and to a wood-bud that is on the upper side of the shoot. The shoots are pruned in spring.

Disbudding is practised in order to leave growths to form as many new shoots as are required. One or two above the fruits must be left, otherwise these will not develop properly. Lateral shoots are stopped at three or four

leaves. The ends of the leading shoots should be slightly pinched in order to regulate them. When a leading shoot happens to be too vigorous, one of the laterals from its base may with advantage be trained to replace it.

Peaches are grown in great quantities and early in the season throughout the



PRUNING TERMINAL SHOOTS OF PEACH. THE LOWER ONE, WHICH HAS FRUITED, IS CUT AWAY, AND THE UPPER ONE (THAT WILL FRUIT THE FOLLOWING SEASON) IS SHORTENED

southern part of France. The peaches of Burgundy and Lyonnais are equally appreciated in the market. The country round Paris furnishes espalier-grown peaches, *Pêche de Montreuil*. This is grown especially at Montreuil, Rosny-sous-Bois, Bagnolet, Fontenay-sur-Bois, Sannois, &c.

THE BEST VARIETIES

ADMIRABLE JAUNE (Large Yellow Peach or Apricot Peach).—Very fertile; *fruit* rather large, globular, greenish yellow, carmined on sunny side; *flesh* bright yellow; September, October.

ALEXIS LEPÈRE.—Fertile; *fruit* large, rounded, furrowed, greenish yellow, and carmine red where exposed to the sun; *flesh* yellowish pink; mid-September.

AMSDEN (June Peach).—Fertile; *fruit* moderately large, rounded, furrowed, whitish and deep purple, spotted on the sunny side; *flesh* pink; mid-July.

BALTET.—Fertile; *fruit* large, rounded-oval, marked with regular furrows, cream white, red in the sun; *flesh* white, bright red at the core; September and October.

BELLE BAUSSE.—Fertile; *fruit* large, globular, yellowish white, carmined in the sun; *flesh* yellowish white, red at the core, non-adherent; mid-September.

BELLE IMPÉRIALE.—Fertile as an espalier; *fruit* large, spherical, slightly furrowed,

yellowish, crimsoned in the sun; *flesh* yellowish white, carmined at the core; mid-September.

BLONDEAU.—Fertile; *fruit* rather large, rounded, depressed, slightly furrowed, almost entirely red and purple, violet-coloured on the sunny side; *flesh* red at the core; end of September.

BONOUVRIER.—Very fertile; *fruit* large, spherical, yellowish and purple in the sun; *flesh* greenish white; end of September.

CUMBERLAND.—Very fertile as an espalier; *fruit* medium size, spherical, whitish and bright red in the sun; *flesh* white; July.

GALANDE POINTUE.—Very fertile; *fruit* very large, rather irregular, oval or globular, whitish yellow, carmined-purple in the sun; *flesh* reddish; mid-August.

GROSSE MIGNONNE (Mignonne Ordinaire, Belle de Ferrières).—Very fertile; *fruit* very large, spherical, flattened, with pronounced furrow, greenish yellow, purple red in the sun; *flesh* whitish, pink at the core; mid-August.

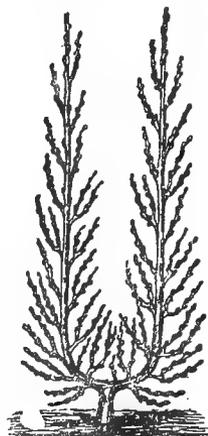
GROSSE MIGNONNE HÂTIVE.—Very fertile; *fruit* very large, spherical, with pronounced furrow, yellowish green, pale red in sun; *flesh* greenish white; beginning of August.

MADÉLINE DE COURSON (Madeline à grandes fleurs).—Very fertile as a standard; *fruit* very large, spherical, clear green, pale pink in sun; *flesh* whitish, pink at the core; end of August, September.

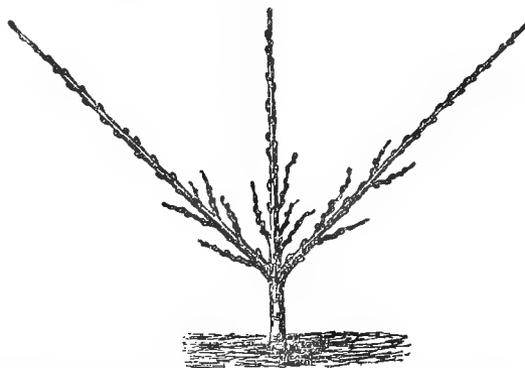
MALTE (Malte de Lisieux).—Moderately fertile; *fruit* rather large, spherical, greenish yellow and purple, marbled in the sun; beginning of September.

NOBLESSE SEEDLING (Alexandra Noblesse).—Fertile; *fruit* large, deep red, furrowed; *flesh* pink at the core; mid-August.

PRÉCOCÉ DE HALE (Hale's Early).—Very fertile as a standard; *fruit* large,



U-SHAPED PEACH TREE



FAN-TRAINED PEACH TREE WITH ONE SERIES OF BRANCHES

spherical, narrow, with well-marked furrow, whitish, deep purple in sun; *flesh* whitish purple at the core; end of July, August.

REINE DES VERGERS (Monstrueuse de Doué).—Very fertile; *fruit* large, globular, with nipple, furrowed, whitish yellow, pale red in sun; *flesh* greenish white, pink at core; mid-September.

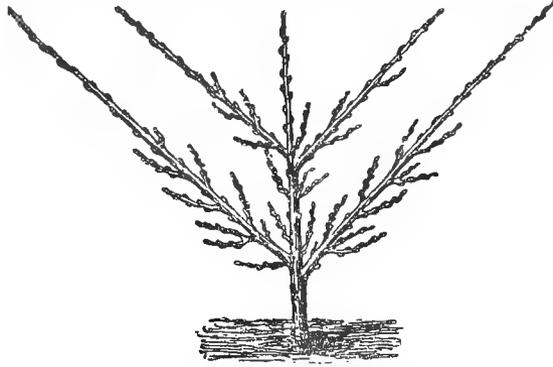
SALWAY.—Fertile; *fruit* very large, almost spherical, with pronounced furrow,

nipped, whitish, golden yellow and deep purple in the sun; *flesh* bright yellow, red at core; end of October.

TÉTON DE VENUS.—Moderately fertile; *fruit* large, oval, with long nipple, yellowish white, brown red in sun; *flesh* whitish, pink at core; end of September.

VILMORIN.—Fertile; *fruit* large, spherical, furrowed, pale yellow, deep red in the sun; *flesh* white, bright purple at core; end of September.

WILLERMOZ (Crawford's Early).—Very fertile as an espalier; *fruit* very large,



FAN-TRAINED PEACH TREE WITH TWO SERIES OF BRANCHES

globular, flattened at ends, golden yellow, purple in the sun; *flesh* yellow, red orange at core; end of August.

THE BEST NECTARINES

DE FELIGNIES.—Moderately fertile; *fruit* medium size, spherical, whitish red on the sunny side; *flesh* pink at core; commencement of August.

ELRUGE.—Fertile; *fruit* large, red, carmined in sun; *flesh* juicy, sweet, agreeably perfumed; a good variety for culture under glass; end of August.

GALOPIN.—Moderately fertile; *fruit* of the largest, spherical, yellowish green, brown red in sun; *flesh* greenish, red at core; beginning of August.

LORD NAPIER.—Very fertile as a standard; *fruit* large, rounded, with slight furrow, greenish yellow, brown red in sun; *flesh* whitish; mid-August.

ORANGE DE PITMASTON (Pitmaston Orange).—Very fertile; *fruit* large, rounded, deep red in the sun; mid-August.

PRÉCOCE DE CRONCELS.—Fertile; *fruit* rather large, spherical, with faint furrow, pale yellow, whitish and garnet red in sun; *flesh* white; beginning of August.

PRÉCOCE RIVERS (Early Rivers).—Fertile; *fruit* large, handsome, deep red colour, one of the best and most beautiful; mid-August.

VICTORIA.—Very fertile; *fruit* rather large, spherical, ovoid, yellowish green, brown red in sun; *flesh* whitish, purple at core; end of September.

VIOLET MUSQUÉ.—Very fertile as an espalier; *fruit* medium size, roundish-oval, yellowish white and red, violet carmine in the sun; *flesh* pink at core; beginning of September.

CLASSIFICATION ACCORDING TO TIME OF RIPENING

PEACHES

Middle and Latter Half of July

Amsden

|

Cumberland

First Fortnight of August

Grosse Mignonne Hâtive		Précoce de Hale
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Second Fortnight of August

Crawford's Early		Madeline de Courson
Galande		Noblesse Seedling
Grosse Mignonne Ordinaire		

First Fortnight of September

Alexis Lepère		Malte
Belle Bausse		Reine des Vergers
Belle Impériale		

Second Fortnight of September

Baltet		Bonouvrier
Blondeau		Téton de Venus

First Fortnight of October

Admirable Jaune		Vilmorin
Salway		

NECTARINES

First Fortnight of August

Early Rivers		Précoce de Croncels
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Second Fortnight of August

Elruge		Lord Napier
De Felignies		Pitmaston's Orange

First Fortnight of September

Galopin		Violet Musqué
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Second Fortnight of September

Victoria		
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PEACHES FOR MARKET CULTURE

Amsden		Grosse Mignonne (Early)
Précoce de Hale		Galande
Alexis Lepère		Belle Impériale
Baltet		Bonouvrier
Salway		

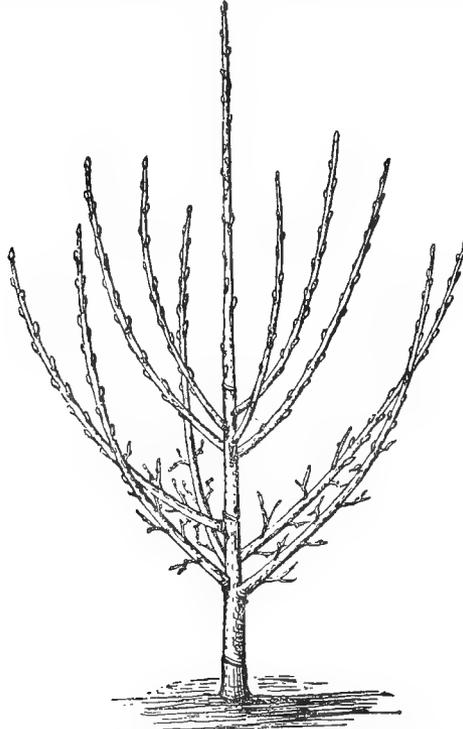
The best variety for culture in the open is La Reine des Vergers.

THE PEAR

The pear is hardy, and its fruit will ripen in a low temperature. Some varieties, however, require the shelter of a wall in the climate of the north of France. The pear may be grown anywhere by choosing suitable varieties and situations. Too much warmth shortens the life of the pear tree, and too much

moisture lessens its fertility. The pear likes rich soil of good consistency, always provided that it is neither too wet nor too dry, and does not contain much lime.

PROPAGATION.—The pear is grafted upon the wild pear, and upon the



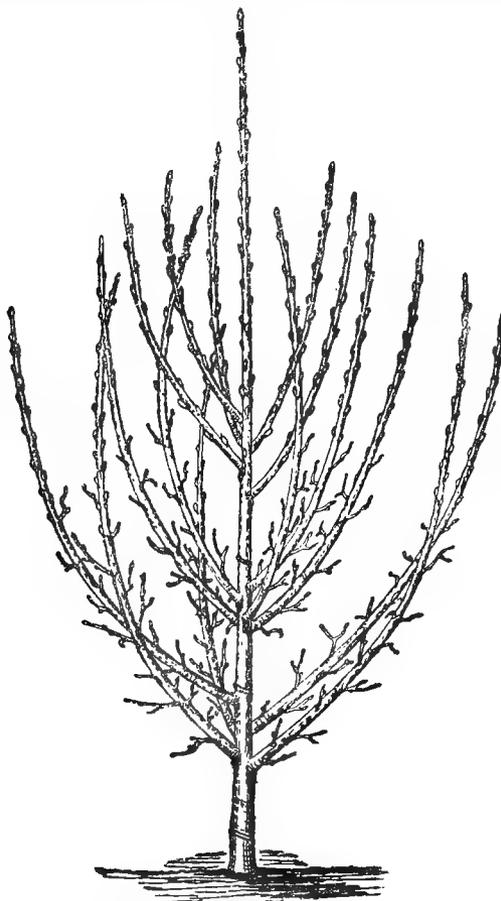
PYRAMID PEAR TREE WITH TWO SERIES OF BRANCHES

Quince. When grafted upon the wild stock the pear is less exacting as to the nature of the soil, though it must have depth, and no excess of water ; but it is less fertile than when grafted upon the Quince. The latter stock is much more frequently used (except in hot and calcareous soils), for the crop is larger and more quickly obtained, and the fruit is much finer.

FORMS.—All varieties of the pear do not grow equally well, so in order to form stems an intermediate stock is often used. The pear is cultivated in all forms—standard, pyramid, trained trees, &c.

Pears grown in the open air are supplied by many regions, especially from the basin of the Loire—Angers, Nantes, l'Aisne, l'Èure, La Seine et Marne, &c. Some are also sent from Burgundy. Choice pears from espalier trees come from the neighbourhood of Paris—Montmorency, Groslais, Montreuil, Rosny-sous-Bois, Fontenay-sous-Bois, Bagnolet, &c.

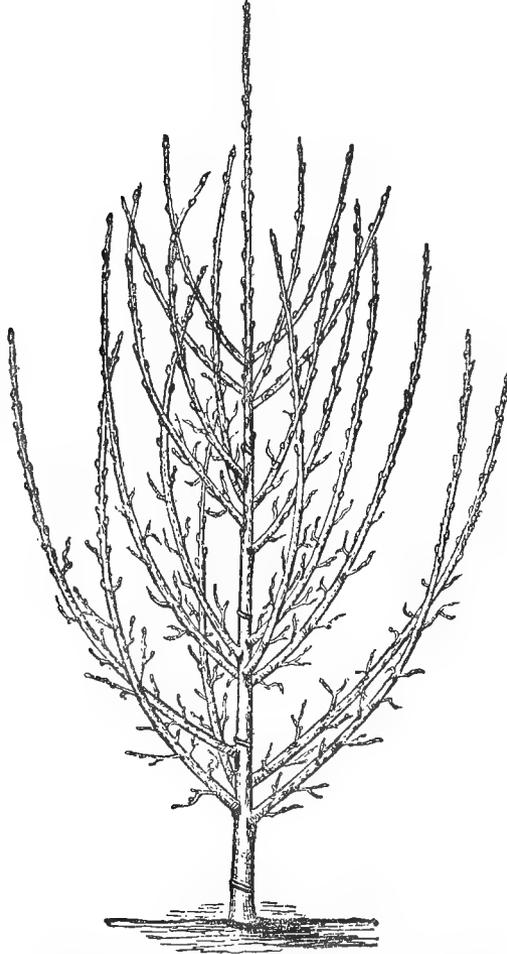
PRUNING.—In pruning, account must be taken of the vigour of the varieties and of the influence of their stocks. Thus Louise Bonne, Duchesse d'Angoulême, Doyenné d'Hiver, Williams', &c., are of moderate vigour and very fertile; therefore, limited forms suit them well, as also Doyenné de Juillet, Beurré



PYRAMID PEAR TREE WITH THREE SERIES OF BRANCHES

de l'Assomption, Souvenir du Congrès, Colmar d'Aremberg, Beurré Clairgeau, Marguerite Marillat, &c., which, making limited growth when upon the Quince stock, require small forms. Beurré Hardy, Doyenné du Comice, Beurré Superfin, Bergamotte Esperen, Doyenné d'Alençon, &c., are vigorous, and require large forms. Curé, Triomphe de Jodoigne, Général Todleben, &c., are still more vigorous, and require plenty of room in order to be satisfactory. The

pear (provided the wood is not frozen) may be pruned during the whole winter up to March. When pruning in winter 1 or 2 millimètres of wood must be left above the "eye" or bud, in order to prevent the drying up of the latter.

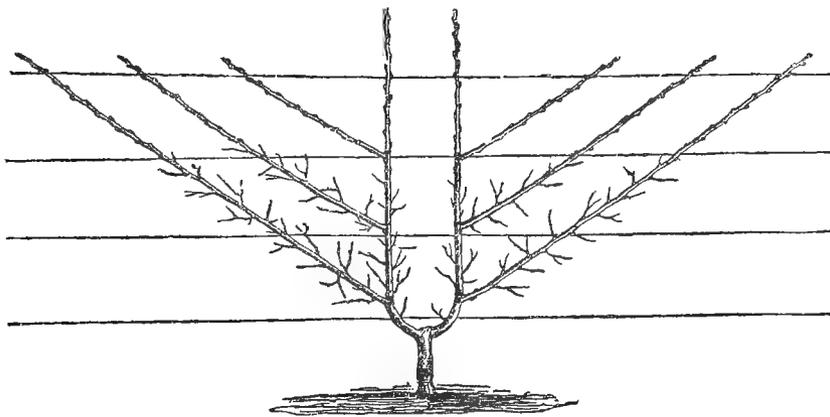


PYRAMID PEAR TREE WITH FOUR SERIES OF BRANCHES

Old trees, and those which are not vigorous, should be first pruned, while young and vigorous trees, on the contrary, are pruned later and not cut back so hard. A good proportion of shoots is kept. On the same tree a weak branch is left long, and a strong branch cut short, in order to re-establish equilibrium.

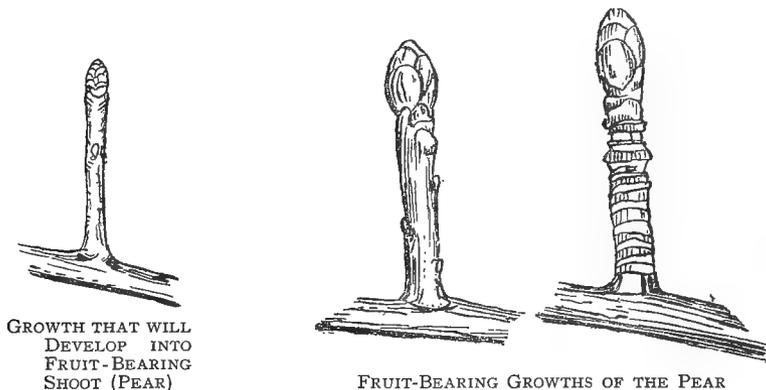
A branch which is pruned early, or not at all, is more favoured than a branch pruned late.

In summer shorten the strong shoots to two or three leaves, and the weaker ones to four or five. On portions of the branches of the third year spurs will



DOUBLE-STEMMED FAN-TRAINED PEAR TREE: EACH STEM HAS THREE BRANCHES

form. The previous year's shoots will be cut down to three, four, or five "eyes" according to their vigour. The fruiting growths of the pear are distinguished as follows:—Those bearing various growths, twiggy shoots, short growths with three, four, or five leaves, and that portion of a shoot from



GROWTH THAT WILL DEVELOP INTO FRUIT-BEARING SHOOT (PEAR)

FRUIT-BEARING GROWTHS OF THE PEAR

where the fruit has been gathered. The pear bears fruit upon growths of various ages, generally upon the short growths, two or three years old, and which usually are developed from the twiggy shoots and short growths previously mentioned. This evolution must therefore be encouraged.

Upon branches three years old, the short and twiggy growths are left untouched, wood growths only are pinched at the third, fourth, or fifth leaf according to their vigour. The side shoots from the main branches should be trained om.10 or Om.12 from each other, to the right and left of the latter, and above and below them, never at the back and front. Upon an unfertile tree, the spurs, twiggy shoots, and the point where the fruit was gathered,



CHARACTERISTIC SHOOT OF PEAR



PORTION OF BRANCH
FROM WHERE FRUIT
HAS BEEN GATH-
ERED

Fruit buds have formed there. Upon the piece of shoot that remains on the branch (and was formerly joined to the stalk) after a pear is gathered, fruit buds will form; it should therefore be retained when pruning.

are retained, while if a tree is bearing sufficiently well, the latter growths are pruned to the base, and the twiggy shoots are cut back half their length. Pinching is practised in order to arrest the growth of certain shoots to prevent their taking too much sap, to ensure the production of good buds at their bases, and also to strengthen neighbouring shoots.

THE BEST VARIETIES

ANDRÉ DESPORTES.—Fertile; *fruit* medium size, turbinate; *stalk* medium, obliquely set in small cavity; *eye* slightly open; *skin* greenish yellow, tinged with pink; *flesh* very delicate, sweet; July–August.

BERGAMOTTE CRASSANE (Crassane).—Moderately fertile; *fruit* rather large,

rounded; *stalk* long, wiry; *skin* greenish yellow, with tawny spots; *flesh* soft, juicy, sweet, perfumed; end of autumn.

BERGAMOTTE ESPEREN.—Very fertile; *fruit* medium sized, rounded; *stalk* thick, straight, in small cavity; *eye* large, deep; *skin* greenish yellow, speckled; *flesh* melting and juicy, very sweet, perfumed; end of winter.

BEURRÉ BACHELIER.—Fertile; *fruit* very large, oblong, turbinate; *stalk* short, obliquely inserted; *eye* large, half-closed; *skin* yellowish green, speckled, tawny and vermillion on the sunny side; *flesh* white, melting, juicy, sweet; November–December.

BEURRÉ BRETONNEAU.—Moderately fertile; *fruit* large, good for cooking; end of winter.

BEURRÉ CLAIRGEAU.—Very fertile; *stalk* medium size; *fruit* large, elongated, often irregular; *eye* open; *skin* greyish yellow, marked and spotted with fawn, vermillion on the sunny side; *flesh* melting, rather acid; November.

BEURRÉ D'AMANLIS.—Very fertile; *fruit* rather large, turbinate, elongated; *stalk* short; *eye* level with fruit; *skin* yellow, marked with brown-red in the sun; *flesh* whitish, melting, very juicy, sweet, perfumed; September.

BEURRÉ D'ANGLETERRE.—Very fertile; *fruit* small, elongated; *eye* small, open, almost projecting; *skin* yellowish green, speckled red, marbled brown; *flesh* white, melting, rather acid, good for cooking; September.

BEURRÉ D'HARDENPONT (Beurré d'Areberg).—Of variable fertility; *fruit* large, oblong; *stalk* short, thick, in large cavity; *eye* very open and deep; *skin* clear yellow, punctuated red, tinged with soft pink on the sunny side; *flesh* white, melting, juicy, sweet; December–January.

BEURRÉ DIEL (Beurré Royal, Beurré Magnifique).—Very fertile; *fruit* very large, turbinate; *stalk* strong, wiry, in rather large cavity; *skin* yellow, speckled with gold, marbled brown; *flesh* white, half-melting, sugared, perfumed; November and December.

BEURRÉ DUMONT.—Moderately fertile; *fruit* large, cylindrical, flattened; *stalk* short, wiry; *eye* small, open; *skin* clear green, speckled brown, tinged red in the sun; *flesh* melting, very juicy and sweet; November.

BEURRÉ GIFFARD.—Moderately fertile; *fruit* medium size, turbinate; *stalk* short; *eye* almost closed; *skin* greenish yellow, dull red on the sunny side; *flesh* melting, slightly perfumed; end of July and August.

BEURRÉ GRIS.—Very fertile; *fruit* medium size or rather large, turbinate or oblong; *stalk* short, wiry; *eye* half-closed, level with the surface; *skin* variable; *colour* grey, white, or golden yellow; *flesh* white, melting, very juicy, sweet; September–October.

BEURRÉ HARDY.—Fertile; *fruit* large, turbinate; *stalk* short, thick, oblique; *eye* small, open; *skin* dark yellow, clear tawny brown, dark red in the sun; *flesh* white, very melting and juicy, sweet, exquisite; September.

BEURRÉ PICQUERY (Des Urbanistes).—Very fertile; *fruit* medium, oval; *stalk* variable; *eye* small and very deep, open; *skin* bright yellow, sometimes red in sun; *flesh* melting, very sweet, perfumed; October–November.

BEURRÉ SUPERFIN.—Fertile; *fruit* rather large, turbinate, irregular; *stalk* swollen, obliquely inserted; *eye* large, round; *skin* golden yellow, speckled and spotted, vermillion in the sun; *flesh* very melting, juicy, sweet, and scented; September.

BON CHRÉTIEN (Williams').—Very fertile; *stalk* short, thick; *fruit* ovoid or oblong; *eye* open; *skin* straw yellow, tawny or carmined in sun; *flesh* white, juicy, melting, very sweet; August and September.

CATILLAC.—Very fertile; *fruit* very large, turbinate, rounded; *stalk* long, thick; *eye* large, open; *skin* greenish yellow, speckled, marbled and spotted with bright brown-red in the sun; *flesh* coarse, juicy, crisp, excellent for stewing and cooking; February–April.

CHARLES COGNÉE.—Very vigorous; *fruit* rather large, oval; *stalk* straight, swollen at end; *eye* open, deep; *skin* pink yellow, delicately punctured with brown; *flesh* slightly granulous, sweet, perfumed; February.

CHARLES ERNEST.—Fertile; *fruit* large, pyriform or turbinate, angular; *stalk* short, thick, wiry; *eye* small, open; *skin* yellow, shaded pink, speckled grey; *flesh* white, delicate, melting, very juicy, sweet, perfumed; November–December.

COMTESSE DE PARIS.—Fertile; *fruit* large, elongated; *stalk* medium size, obliquely inserted; *eye* half-open, slightly depressed; *skin* greenish tinged with red, speckled with brown; *flesh* very juicy and sweet; December–January.

CURÉ (Belle de Berry).—Very fertile on Quince; *fruit* very large, elongated; *stalk* thick; *eye* large, level with surface of fruit; *skin* clear, greenish yellow and brown red; *flesh* white, melting, perfumed; good for cooking; December–February.

DE TONGRES (Beurré Durondeau).—Fertile; *fruit* rather large, pyriform; *skin* tawny, tinted red, and speckled grey; *eye* half-closed, in slight depression; *stalk* short; *flesh* whitish, rather acid, very juicy, perfumed; October.

DOCTEUR JULES GUYOT.—*Fruit* large or very large, pyriform; *stalk* irregular; *skin* lemon yellow and pink; *flesh* melting, juicy, sweet; November.

DOYENNÉ D'ALENÇON.—Very fertile; *fruit* medium size, rounded oval, irregular; *stalk* short, thick, wiry; *eye* small, half-closed; *skin* yellowish red, speckled, and marbled with brown and grey; *flesh* white, juicy, sweet; December–February.

DOYENNÉ D'HIVER (Bergamotte de Pentecôte).—A very fertile pear; *fruit* very large, globular, irregular; *stalk* short, thick, swollen; *eye* large, open; *skin* greenish yellow, speckled and spotted brown; *flesh* whitish, melting, a little granulous at the core, very sweet, perfumed; January to April.

DOYENNÉ DE JUILLET.—Very fertile; *fruit* small, spherical; *stalk* thick, wiry, swollen, in deep cavity; *eye* small, half-closed, level with the surface of fruit; *skin* greenish yellow, carmined on the sunny side; *flesh*, melting, perfumed; mid-July.

DOYENNÉ DORÉ (Doyenné Blanc, Doyenné St. Michel).—Very fertile; *fruit* medium size, rounded oval, irregular; *stalk* short, thick, oblique; *eye* small, half-closed; *skin*, whitish yellow, with brown spots, red and vermilion in the sun; *flesh* melting, juicy, and sweet; September–October.

DOYENNÉ DU COMICE.—Moderately fertile; *fruit* large, regular, turbinate; *stalk* swollen and oblique, no cavity; *eye* in a large irregular cavity; *skin* straw yellow, speckled, and marbled with brown, vermilion in the sun; *flesh* white, melting, juicy, very sweet; November–December.

DUCHESSÉ D'ANGOULÊME.—Very fertile; *fruit* very large, oval; *stalk* short, thick; *eye* half-closed; *skin* greenish yellow, sometimes pale pink in the sun; *flesh* white, melting, sweet, vinous. October to January.

EPARGNE.—Very fertile; *fruit* medium size, elongated, cylindrical; *stalk* long, swollen; *eye* small, open, level with the surface of fruit; *skin* clear yellowish green, vermilion in the sun; *flesh* white, with greenish veins, very juicy, rather acid; end of July.

FAVORITE DE CLAPP (Clapp's Favourite).—Fertile; *fruit* large, oval; *stalk* short; *eye* half-closed in a narrow and not very deep cavity; *skin* greenish yellow tinged with pale red, carmined and dotted with red in the sun; *flesh* white, melting, juicy, sweet; August.

FONDANTE DES BOIS (Beurré Spence).—Fertile; *fruit* very large, oblong; *eye* half-closed; *stalk* swollen in deep cavity; *skin* golden yellow and bright red in the sun; end of autumn.

FONDANTE DU PANISEL (Délice d'Hardenpont, d'Angers).—Very fertile; *fruit* rather large, oval or round, very irregular; *stalk* short, thick; *eye* small, half-closed in cavity; *skin* lemon yellow, dark red in the sun; *flesh* medium size, melting, sweet, perfumed; November.

JOSEPHINE DE MALINES.—Fertile; *fruit* rather large, irregular or rounded; *stalk* short, thick; *skin* lemon yellow, marked with red in the sun; *flesh* melting, juicy, sugared, perfumed; November to February.

LA FRANCE.—Fertile; *fruit* rather large, rounded conical, irregular; *stalk* thick, rather short in deep cavity; *eye* half-open; *skin* greyish, pale yellow, bronzy green in the sun; *flesh* white, melting, very juicy, very sweet, perfumed; October and November.

LE LECTIER.—Fertile; *fruit* large, elongated; *stalk* short, no cavity; *eye* large, half-open, slightly sunken; *skin* greenish, getting yellow as fruit matures; *flesh* white, melting, juicy, sweet; January.

LOUISE BONNE D'AVRANCHES (Louise Bonne).—Very productive; *fruit* large, oval, elongated; *stalk* rather long, swollen, no cavity; *eye* half-closed; *skin* yellowish green

with large brown spots, bright red in the sun; *flesh* white, juicy, melting, sweet, perfumed; September and October.

MADAME TREYVE.—Moderately fertile; *fruit* large, variable, conical, elongated, or oval; *stalk* small, swollen, oblique, no cavity; *eye* small, half-closed; *skin* olive yellow, spotted with gold, reddish in the sun; August and September.

MARTIN SEC.—Very productive; *fruit* medium size, turbinate; *stalk* long, swollen; *eye* large; *skin* clear red, punctured yellow, carmined in the sun; *flesh* whitish, crisp, sweet; good for cooking; November to January.

MESSIRE JEAN.—Very productive; *fruit* medium size, turbinate; *stalk* short, no cavity; *eye* large, open; *skin* golden red and brownish; good for preserving; November.

NEC PLUS MEURIS (Beurré d'Anjou).—Moderately fertile; *fruit* large, oval; *stalk* short, thick; *eye* half-open; *skin* yellowish green, red-brown in the sun; *flesh* yellowish, melting, juicy, sweet, perfumed; November.

OLIVIER DE SERRES.—Moderately productive; *fruit* medium size, spherical; *stalk* rather short, wiry, in deep cavity; *eye* large; *skin* olive yellow, tinted tawny; *flesh* whitish, melting, sweet, perfumed; February–March.

PASSE COLMAR.—Moderately fertile; *fruit* moderately large, turbinate, often elongated; *stalk* swollen, no cavity; *eye* open in large cavity; *skin* golden yellow, speckled, and spotted with red; *flesh* melting or half-crisp, juicy, very sweet, perfumed; December–February.

PASSE CRASSANE.—Moderately fertile; *fruit* large, rounded, oval; *stalk* rather long, swollen; *eye* large, open; *skin* yellowish green, speckled red, tinged with tawny brown; *flesh* white, perfumed, half-melting, slightly acid flavour; January–March.

REMY CHATENAY.—Fertile; *fruit* large, pyriform, rounded; *stalk* fleshy, without cavity; *eye* open, deep-set; *skin* greenish yellow, spotted pink, speckled with tawny on the sunny side; *flesh* rather juicy, sugary; March–April.

SEIGNEUR ESPEREN (Seigneur, Bergamotte, Curative).—Very productive; *fruit* medium size or rather large, variable, oval or globular; *stalk* short, straight, in small cavity; *eye* open; *skin* greyish yellow; *flesh* white, melting, juicy, sugary, perfumed; September–October.

SOLDAT-LABOUREUR.—Moderately fertile; *fruit* rather large, variable, turbinate; *stalk* short, strong, wiry; *eye* large, closed; *skin* golden yellow, red brown; *flesh* white, melting, juicy, very sweet; October–November.

TRIOMPHE DE JODOIGNE.—Moderately fertile; *fruit* large or very large, conical, rregular; *stalk* swollen, no cavity; *eye* small; *skin* dull yellow, marked with red, red on the sunny side; *flesh* whitish and melting; November and December.

TRIOMPHE DE VIENNE.—*Fruit* large, pyriform; *eye* open; *skin* bright yellow, brown, and slightly pink on the sunny side; *flesh* white, melting, very juicy, perfumed; August–September.

CLASSIFICATION ACCORDING TO TIME OF RIPENING

Second Fortnight of July

André Desportes		Doyenné de Juillet
Beurré Giffard		Epargne

August

Bon Chrétien (Williams')		Docteur Jules Guyot
Clapp's Favourite		

September

Beurré d'Amanlis		Beurré Superfin
„ Gris		Madame Treyve
„ Hardy		Triomphe de Vienne

THE FRUIT GARDEN

September-October

Beurré Picquery	Louis Bonne
Doyenné Doré	Seigneur Esperen
Fondante des Bois	

October and November

Beurré Dumont	De Tongres
Doyenné du Comice	Fondante du Panisel
Duchesse d'Angoulême	Nec plus Meuris

November-December

Bergamotte Crassane	Beurré Diel
Beurré Bachelier	Charles Ernest
„ Clairgeau	Soldat-Laboureur

December-January

Beurré d'Hardenpont	Le Lectier
Comtesse de Paris	Passé Colmar
La France	Triomphe de Jodoigne

January-March-April

Bergamotte Esperen	Josephine de Malines
Charles Cognée	Passé Crassane
Doyenné d'Alençon	Olivier de Serres
„ d'Hiver	Remy Chatenay

VARIETIES FOR MARKET CULTURE

Beurré Clairgeau	Doyenné d'Hiver
„ Diel	„ du Comice
„ d'Hardenpont	Duchesse d'Angoulême
„ Hardy	Epargne
„ d'Amanlis	Louise Bonne
Charles Ernest	Passé Crassane
Curé	Williams'

COOKING VARIETIES

Beurré d'Angleterre	Curé
„ Bretonneau	Martin Sec
Catillac	Messire Jean

VARIETIES FOR PERRY-MAKING

Carisie-gros.	Carisie-petit.
De Maude.	Ragnet.
De Cirole.	De Sauge.

VARIETIES FOR STANDARDS

All Cooking and Perry-making varieties ; and also

Beurré d'Amanlis.	Epargne.
„ Hardy.	Comtesse de Paris.
„ Dumont.	Louise Bonne.
Bergamotte Esperen.	Soldat-Laboureur.
Doyenné d'Alençon.	Williams'.

VARIETIES FOR PYRAMIDS

André Desportes	Doyenné du Comice
Bergamotte Esperen	Duchesse d'Angoulême
Beurré Bachelier	Favorite de Clapp
„ Clairgeau	Fondante des Bois
„ Dumont	„ du Panisel
„ Giffard	La France
„ Gris	Le Lectier
„ Hardy	Louise Bonne
„ Picquery	Madame Treyve
„ Superfin	Nec plus Meuris
Bon Chrétien (Williams')	Olivier de Serres
Charles Ernest	Passé Colmar
Comtesse de Paris	„ Crassane
De Tongres	Remy Chatenay
Docteur Jules Guyot	Seigneur Esperen
Doyenné de Juillet	Soldat-Laboureur
„ „ Doré	Josephine de Malines
„ „ d'Alençon	Triomphe de Vienne

VARIETIES FOR PALMATES

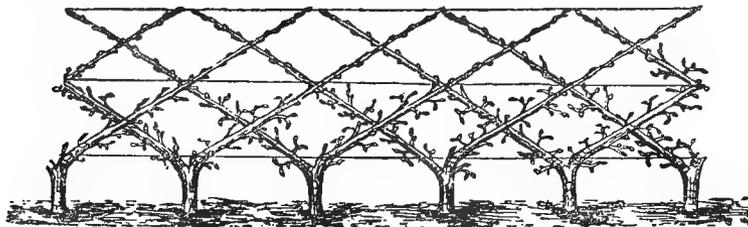
All the varieties mentioned for Pyramids, and especially

Epargne	Beurré d'Aremberg
Beurré d'Amanlis	Bergamotte Crassane
„ Diel	Charles Cognée
Josephine de Malines	Passé Colmar
Triomphe de Jodoigne	

THE APPLE

The apple, like the pear, is hardy and grows well almost anywhere, provided that it has plenty of air, and a rather strong soil.

PROPAGATION.—It is increased by grafting upon the wild stock for standard



NET-WORK FORM OF TRAINING (APPLE)

trees; upon the Doucin for pyramids, palmates, &c.; upon the Paradise stock for cordons. Varieties which are not sufficiently vigorous are grafted upon an intermediate stock; for example, upon Noire de Vitry, or Genereuse de Vitry, &c. The apple upon the Paradise stock does not require a deep soil, but it must have a cool one. In dry soil and that containing lime it is better to have trees on the Doucin stock for the small forms. The apple tree is

most often grown as a standard, particularly the cooking varieties and the free-bearing ones. In the market garden only tender varieties and those of great value are cultivated upon walls, or trained vase-shaped in the open.

In the amateur's garden the apple is cultivated in the form most convenient to the garden, often as a horizontal cordon. The remarks upon pruning the pear apply to the apple, except that one may cut in the shoots rather more closely.

Apples are grown more or less throughout France, sometimes for cider-making, sometimes for the market. They are cultivated especially for these purposes in Normandy, Brittany, Picardy, Artois, La Sarthe, La Mayenne, Le Nord, Le Puy de Dôme, La Limagne, Le Limousin, La Seine et Marne, &c.

In the neighbourhood of Paris the best apples are grown at Montreuil, Rosny, Sannois, Versailles, &c.

THE BEST VARIETIES

API-PETIT (Api rose).—Very fertile; *fruit* small, spherical, flattened; *stalk* short in large cavity; *eye* partly closed; *skin* straw yellow, carmined in the sun; *flesh* greenish white, crisp, juicy, sweet, and of agreeable flavour; January–May.

ASTRAKAN ROUGE (Transparent Red).—Very productive; *fruit* medium size, globular, irregular; *stalk* medium sized, wiry; *eye* small, half-closed; *skin* greenish yellow; crimsoned in the sun; end of July.

BATT'S BEAUTY.—Fertile; *fruit* rather large, rounded, depressed at the eye; *stalk* medium or rather short in large and deep cavity; *eye* rather large, with long sepals in a large but not deep cavity; *skin* clear yellow, spotted marbled and tinged with vermilion; *flesh* yellowish white, firm, juicy, sweet, perfumed; July–August.

BELLE-FILLE.—Very fertile; *fruit* medium size, spherical, flattened; *stalk* short, rather thick; *eye* small; *skin* clear yellow, marbled with tawny brown on the sunny side; *flesh* whitish, crisp, sweet, perfumed; November–February.

BOROVITSKY.—Moderately fertile; *fruit* large, globular; *stalk* short, thick; *eye* large, half-closed; *skin* clear yellow, streaked with carmine; *flesh* white, soft, slightly acid; July–August.

CALVILLE BLANCHE.—Very fertile; *fruit* very large, variable; *stalk* short, slender in variable cavity; *eye* large, half-closed; *skin* straw yellow, speckled grey, spotted red, soft pink on the sunny side; *flesh* yellowish, firm, juicy, very sweet, perfumed; December–May.

COURT PENDU GRIS.—Not very fertile; *fruit* medium size, flattened, globular; *stalk* short, strong in deep cavity; *eye* large; *skin* greenish yellow, brown in the sun; *flesh* yellowish, firm, sweet and perfumed; November–March.

DE CHATAIGNIER.—Very fertile; *fruit* medium size, spherical, rounded oval; *stalk* short, swollen; *eye* large, half-closed; *skin* greenish yellow, tinged with carmine; *flesh* white and yellowish, crisp, rather sweet; December–April; standard.

DE JAUNE (Reinette de Mans).—Very fertile; *fruit* rather large, rounded oval; *stalk* very short, very strong; *eye* large, open; *skin* clear yellow and red brown; January–May.

DE L'ESTRE (L'Estre, De la Fenêtre).—Moderately fertile; *fruit* rather large, elongated, cylindrical; *stalk* variable, large; *eye* very open; *skin* clear yellow, marked red and pink, carmined in the sun; December–May.

DE LANDE.—Productive; *fruit* medium size, red; *flesh* firm, good for preserves; February–April.

DE VÉRITÉ.—*Fruit* small, greenish and pink; April, May.

FENOUILLET GRIS.—Moderately fertile; *fruit* medium size, globular; *stalk* short in large cavity; *eye* small; *skin* dark yellow, tinged with red grey; *flesh* white, rather soft, sweet scented; December–April.

GRAND ALEXANDRE.—Fertile; *fruit* very large, conical, rounded; *stalk* short, thick in variable cavity; *eye* very large, half-closed; *skin* yellowish, tinged with carmine and covered with a glaucous bloom; *flesh* greenish, crisp, very sweet; September–November.

GRAVENSTEIN.—Very fertile; *fruit* large, conical, irregular; *stalk* thick; *eye* large, half-closed; *skin* clear yellow, carmined in the sun; *flesh* whitish, soft, very sweet perfumed; September–November.

JEANNE HARDY.—Fertile; *fruit* large or very large, red; December–January.

LINNÆUS PIPPIN (Lincoln Pippin, Belle Fleur Jaune).—Moderately fertile; *fruit* rather large, elongated, conical; *stalk* rather short; *eye* large; *skin* brilliant yellow, soft pink in the sun; *flesh* yellowish, soft, acidulated, and perfumed; December–February.

MENAGÈRE (P. de Livre).—Fertile; *fruit* very large, spherical, flattened; *stalk* medium sized; *eye* very large, scarcely opened; *skin* pale yellow, tinged with brick red; *flesh* whitish, very crisp, rather sweet; December–January.

PEASGOOD'S NONESUCH (Sans Pareille de Peasgood).—*Fruit* large or very large, spherical; *stalk* short; *eye* large, open; *skin* pale yellow, bright pink in the sun; *flesh* yellowish, soft, sweet, perfumed; September–November.

PIGEON ROUGE D'HIVER (Pigeon Rouge, Pigeonnet Rose).—Very fertile; *fruit* medium size, carmined yellow; November–January.

RAMBOUR D'ÉTÉ.—Very fertile; *fruit* very large, flattened, globular; *stalk* short, wiry, oblique, in large, deep cavity; *eye* large, half-closed; *flesh* whitish yellow, red brown, carmined; September.

RAMBOUR D'HIVER.—Moderately fertile; *fruit* very large, flattened, globular; *stalk* short, rather thick, in large cavity; *eye* large; *skin* pale yellow, carmined and tawny in the sun; *flesh* sweet; November–March.

RAVAILLAC.—Fertile; *fruit* medium size; winter.

REINE DES REINETTES.—Moderately fertile; *fruit* medium size, cylindrical, conical; *stalk* medium size, strong, wiry; *eye* large, half-closed; *skin* grey and yellow, carmine brown in the sun; *flesh* firm, sweet; December–March.

REINETTE BAUMANN (Reinette de Bolleviller).—Moderately fertile; *fruit* large, round, conical; *stalk* very thick, short; *eye* large; *skin* yellowish, tinged carmine, and spotted brown; *flesh* somewhat acid; January–March.

REINETTE BLANCHE DU CANADA.—Moderately fertile; *fruit* very large, globular, elongated or flattened, conical; *stalk* short, in large cavity; *eye* very large; *skin* golden yellow, spotted with brown, speckled grey, red on the sunny side; *flesh* yellowish, rather soft, sweet, juicy, with a very delicate flavour; January–March.

REINETTE DE CAUX.—Very fertile; *fruit* very large, of variable form; *stalk* swollen, in large cavity; *skin* golden yellow, carmined and tawny, speckled with clear grey; *flesh* yellowish white, firm and juicy, sweet, perfumed; October–April.

REINETTE DE CUZY (Reinette Carrée).—Moderately fertile; *fruit* medium or large, elongated, conical or rounded; *stalk* short, wiry; *skin* deep yellow, brick red in the sun; *flesh* sweet; January–May.

REINETTE DORÉE DE VITRY.—Very fertile; *fruit* medium size, globular; *stalk* short usually; *eye* rather large, open or half-closed; *skin* golden yellow, brown in the sun; *flesh* white, sweet, and of exquisite flavour; December–April.

REINETTE FRANCHE.—Fertile; *fruit* rather large, of variable form; *stalk* usually short, in narrow cavity; *skin* pale yellow, spotted with grey; *flesh* yellowish white, crisp, very sweet, perfumed; December–May.

REINETTE GRISE DE SAINTONGE (Reinette Haute Bonté).—Moderately fertile; *fruit* medium size, variable in form; *stalk* rather long; *eye* large; *skin* deep grey; *flesh* yellowish, crisp, sweet; January–April.

REINETTE GRISE DU CANADA (Canada Gris).—Very fertile; *fruit* very large, globular; *stalk* short, strong; *eye* large, very open; *skin* greenish yellow, tinged with brown grey; *flesh* crisp, juicy, and sweet, perfumed; November–April.

REINETTE GRISE DE VITRY.—Very fertile; *fruit* medium size, conical, rounded or spherical, flattened; *stalk* very short, stout, in large cavity; *eye* large, open or half-closed; *skin* greenish, tinged with grey brown and marked with red; *flesh* rather soft, sweet, deliciously perfumed; December–April.

RIBSTON PIPPIN.—Very fertile; *fruit* large, irregular, cone-shaped; *stalk* short, wiry; *eye* large; *skin* golden yellow, dull red, marbled, tawny in the sun; *flesh* yellowish, sweet, perfumed; December–March.

ROYALE D'ANGLETERRE (Reinette d'Angleterre).—Very fertile; *fruit* very large, rounded, conical; *stalk* short, thick, oblique; *eye* large, open or half-closed; *skin* lemon yellow, orange yellow, and clear red, with tawny spots on the sunny side; *flesh* yellowish sweet, perfumed; September–December.

SUGAR-LOAF PIPPIN (Reinette Pain de Sucre).—Moderately fertile; *fruit* moderately large, truncate, conical, more or less pointed or rounded; *skin* beautiful pale green, turning to yellow; *eye* half-open, in narrow and deep cavity; *stalk* medium or short, in large cavity; *flesh* whitish, rather crisp, somewhat acid; beginning of August.

TRANSPARENTE DE CRONCELS.—Fertile; *fruit* rather large, spherical; *stalk* slender; *eye* large, open or half-open; *skin* yellowish white, pale pink on the sunny side; *flesh* salmon-coloured, juicy, rather acid, perfumed; August–December.

CLASSIFICATION ACCORDING TO TIME OF RIPENING

<i>End of July</i>	
Astrakan Rouge Beauty of Bath	Borovitsky
<i>August</i>	
Sugar-loaf Pippin	
<i>August–September</i>	
Rambour d'Été	Transparente de Croncels
<i>September–October</i>	
Grand Alexandre Gravenstein	Peasgood's Nonsuch
<i>October, November, December</i>	
Jeanne Hardy Ménagère	Reine des Reinettes Royale d'Angleterre
<i>December–January</i>	
Fenouillet Gris Linnæus Pippin	Reinette Baumann „ Dorée de Vitry
<i>January–April</i>	
Api Rose Calville Blanche Pigeon Rouge d'Hiver Rambour d'Hiver Reinette de Caux „ de Cuzy	Reinette Blanche du Canada „ du Canada Grise „ Franche „ Grise de Saintonge „ Grise de Vitry

VARIETIES FOR MARKET CULTURE

DWARF TREES

Grand Alexandre Transparente de Croncels Reinette Blanche du Canada „ Grise du Canada	Reinette de Caux Api Rose Calville Blanche Reinette de Cuzy
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STANDARDS

Belle Fille		De Jaune
De Chataignier		De Lande

VARIETIES FOR CIDER MAKING

October

Blanc Mollet		St. Laurent
Reine des Hâtives		

November

Amère de Berthecourt		Martin Fessard
Argite Grise		Medaille d'Or
Barbarie		Passe Reine des Pommes
De Moran		Rouge Bruyère
Godard		Rouge de Trèves

End of November and December

Bedan		De Bouteille
Binet Blanc		Grise Dieppoise
Marin Dufray		Hauchecorne
Rousse Latour		Peau de Vache Nouvelle

VARIETIES FOR STANDARDS

All the cider varieties		Reinette Dorée de Vitry
Astrakan Rouge		„ de Caux
Gravenstein		„ de Cuzy
Fenouillet Gris		„ Blanche du Canada
Linnæus Pippin		„ Grise de Saintonge
Rambour d'Été		„ de Vitry
Reine des Reinettes		Royale d'Angleterre, &c.
Reinette Baumann		

VARIETIES FOR PYRAMIDS

All except Grand Alexandre, Peasgood's Nonesuch, and Ménagère. These are best as trained trees on account of the size of their fruits. Calville Blanche requires wall culture.

THE PLUM

The plum on account of its early flowering dreads the frosts, and requires, as far as possible, a sheltered situation. It is not difficult to suit as regards soil, always provided that this is neither excessively dry nor wet and moderately deep. This permits of its culture throughout almost the whole of France. The plum tree is propagated by grafting. Some local varieties are propagated by suckers. The seedling St. Julien is the stock generally used; the variety changing with the locality. The plum is extensively grown both by amateurs and for sale. Amateurs grow the trees in various trained forms. For market gardens standards alone are recommended; they are planted 5 or 6 mètres from each other. The plum is grown throughout France, but especially in the

neighbourhood of large towns where the sale of fresh plums is certain. In the vicinity of Paris the chief districts are Argenteuil, Sannois, Epinay, Raincy, Rosny-sous-Bois, the valley of the Bicore, &c. The east of France furnishes prunes and mirabelles. In Tourraine and the region of Agen prunes are grown in great quantities.



SHOOT OF PLUM TREE IN FRUIT

PRUNING.—The fruit is borne upon branches and twigs of one year's growth. This must be remembered in pruning, and care taken not to destroy fruit-buds when cutting the shoots; cut to a "wood"-bud, always more pointed than a "flower"-bud. The disbudding and pinching should be moderate. In training the shoots must be taken in good time and handled with care, for they are very brittle.

THE BEST VARIETIES

BONNE DE BRV.—Fertile; *fruit* small, spherical; *stalk* short, in narrow, slight cavity; *skin* reddish black; *flesh* greenish; end of July.

COË'S GOLDEN DROP (Goutte d'Or de Coë).—Very fertile; *fruit* large, elongated, oval, with a marked furrow; *stalk* long, slender, narrow cavity; *skin* golden yellow, tinged with red; *flesh* yellow; end of September, October.

D'AGEN (D'Ente).—Very fertile; *fruit* elongated, ovoid, with pronounced furrow; *stalk* rather long, in narrow, deep cavity; *skin* violet pink, plum-coloured, or bluish; beginning of September.

DE MONTFORT.—Fertile; *fruit* rather large, long, ovate; *stalk* rather thick, deep cavity; *skin* dark violet, slightly tawny; *flesh* greenish yellow; mid-August.

JEFFERSON.—Very fertile; *fruit* large, round, with large shallow furrow; *skin* greenish yellow, rose-coloured on the sunny side; *flesh* greenish; end of August, September.

KIRKE'S.—Fertile; *fruit* large, spherical, large shallow furrow; *stalk* rather long, in deep cavity; *skin* violet purple, or whitish plum colour; *flesh* greenish yellow; September.

MIRABELLE GROSSE DE NANCY.—Moderately fertile; *fruit* medium size, spherical, broad shallow furrow; *stalk* rather short, slender, in narrow, deep, regular cavity; *skin* yellow, marbled with pure rose; end of August, September.

MIRABELLE PETITE DE METZ.—Very fertile; *fruit* small, or very small, rounded-ovoid, broad, well-marked furrow; *stalk* slender, in narrow, slight cavity; *skin* golden yellow, marbled with amaranth red; *flesh* yellow; August.

MONSIEUR HÂTIF.—Very fertile; *fruit* medium sized, rounded, with shallow furrow; *stalk* rather short, in narrow cavity; *skin* intense purple, tinged with yellow; *flesh* yellowish green; beginning of August.

MONSIEUR À FRUIT JAUNE.—Moderately fertile; *fruit* medium, or rather large, rounded-ovoid; *stalk* medium, in regular cavity; *skin* yellow, speckled with gold, and striped with carmine red; *flesh* yellow; mid-August.

QUETSCHÉ D'ALLEMAGNE (Altesse-Ordinaire).—Very fertile; *fruit* medium, or rather large ovoid, or regular elliptical; *stalk* thick, rather long, without cavity; *skin* violet purple, plum-coloured; *flesh* yellow green. Prune. September.

QUETSCHÉ D'ITALIE.—Very fertile; *fruit* medium, or rather large, long-ovoid; *stalk* thick, long, in narrow, rather deep cavity; *skin* violet, and whitish plum-coloured. Prune. End of September.

REINE CLAUDE D'ALTHANN.—Very fertile; *fruit* large, spherical, broad, slight

furrow ; *stalk* slender, rather long, in large, shallow cavity ; *skin* yellowish, purpled in the sun ; *flesh* clear yellow ; August-September.

REINE CLAUDE DE BAVAY.—Very fertile ; *fruit* large, rounded-oval, wide furrow ; *stalk* medium, in narrow and deep cavity ; *skin* greenish yellow, shining, delicately marked ; end of September.

REINE CLAUDE DIAPHANE (Reine Claude Transparente).—Fertile ; *fruit* large, spherical, with faint furrow ; *stalk* thick, short, in narrow, deep cavity ; *skin* golden yellow, rose carmine in the sun ; *flesh* greenish yellow ; beginning of September.

REINE CLAUDE DORÉE (Reine Claude Abricotine).—Very fertile ; *fruit* medium or rather large, spherical, with wide deep furrow ; *stalk* short, thick, in broad, deep cavity ; *skin* yellowish green, golden in the sun ; *flesh* yellowish green ; end of August.

REINE CLAUDE HÂTIVE.—Fertile ; *fruit* medium size, spherical, with slight furrow ; *stalk* short, in slight cavity, greenish yellow ; mid-July.

REINE CLAUDE VIOLETTE.—Fertile ; *fruit* medium or rather large, spherical ; *skin* deep violet, spotted tawny yellow, plum blue ; *flesh* greenish ; mid-September.

STE. CATHERINE.—Fertile ; *fruit* golden yellow ; *flesh* rather acid. Prune. Mid-September.

CLASSIFICATION ACCORDING TO TIME OF RIPENING

Second Fortnight of July

Bonne de Bry		Reine Claude Hâtive
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First Fortnight of August

Monsieur Hâtif		De Montfort
„ à Fruit Jaune		

Second Fortnight of August

Kirke's		Reine Claude d'Althann
Mirabelle Grosse de Nancy		„ „ Dorée
„ Petite de Metz		

First Fortnight of September

D'Agen		Reine Claude Diaphane
Jefferson		„ „ Violette
		Noberte

Second Fortnight of September

Coë's Golden Drop		Quetsche d'Italie
Quetsche d'Allemagne		Reine Claude de Bavay

The plum is generally grown as a standard ; other forms are not to be recommended.

VARIETIES FOR MARKET CULTURE

Monsieur Hâtif		De Montfort
Mirabelle Petite, for jams and liqueurs		Reine Claude Dorée
Coë's Golden Drop		„ „ Violette
		„ „ de Bavay

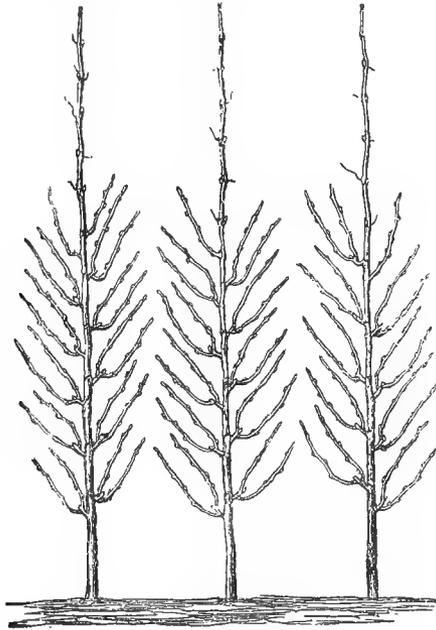
St. Catherine, d'Agen, Quetsche d'Allemagne (Prunes)

The Noberte plum, for tarts, &c., is very much grown in Le Soissonnais. The tree is moderately vigorous, and very fertile. Its medium-sized black fruit is much appreciated.

THE VINE

The vine dreads hard frosts, and unless sheltered situations with good aspects be found for it, spring frosts will often spoil the prospects of a good crop. Moreover, to ripen the fruit a rather high temperature is necessary, which is tantamount to saying that with the exception of a few early varieties, such as *Black Madeline*, the *Golden Chasselas*, and a few others, recourse must be had to walls facing the east and south for vine culture in the neighbourhood of Paris.

The soil must be good, rather light, siliceous, or calcareous. As the roots



SINGLE CORDON VINES

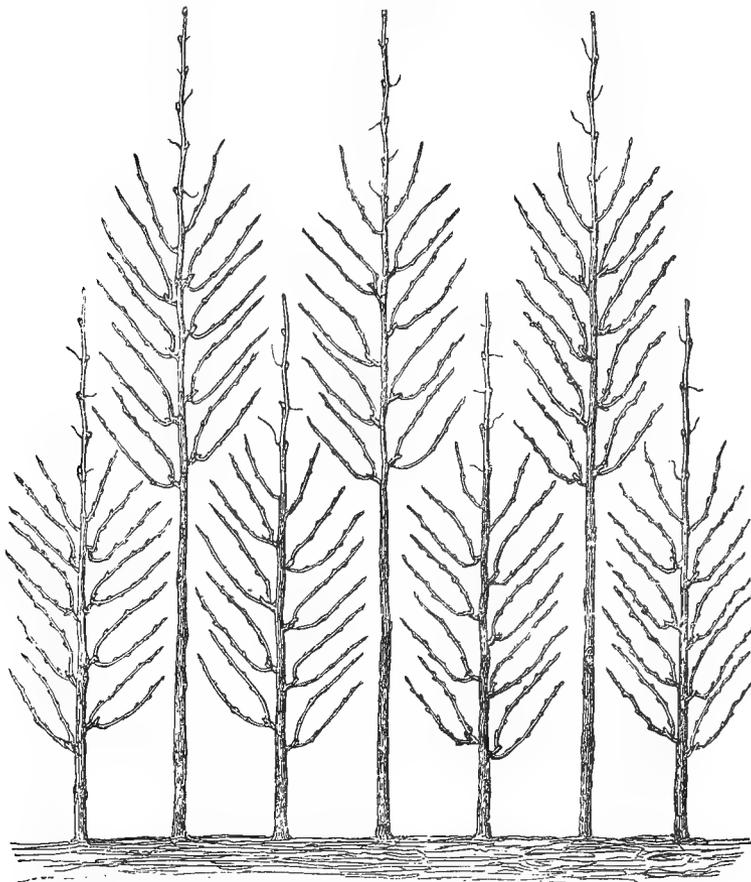
spread there is no need of great depth of soil. The vine is propagated in several ways: by cuttings, layers, or grafting. This last method is generally employed in order to utilise certain "stocks" which withstand the phylloxera.

FORMS.—The vine is cultivated in the ancient "Thomery" form, as vertical cordons and palmates.

Planting varies according to the form of tree. For the "Thomery" each side of the horizontal cordon has about 1m.50 space, that is 3 mètres for the entire cordon. For simple palmates the distance apart is 1 mètre; and for alternate palmates, 0m.50 or 0m.60. For ordinary cordons, 2 mètres; and for cordons with long shoots, 1 m. or 1m.50.

PLANTING.—The soil having been first prepared and strongly manured, a

trench is opened at the foot of the wall or espalier, and the plant is placed in at a depth of 0m.30 or 0m.35. Contrary to the ancient practice, which demanded a depth of from 1 m. to 1m.50, the stem is buried in the soil 0m.50 deep at the utmost. In rather wet land the planting is done close to the foot of the wall; on the other hand, in hot dry soils the vine is planted on the north



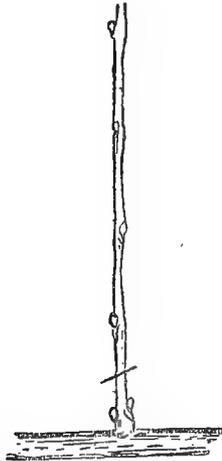
DWARF AND TALL CORDON VINES ALTERNATELY ARRANGED

side, and the shoot is brought through the wall in order that it may be trained on the south side.

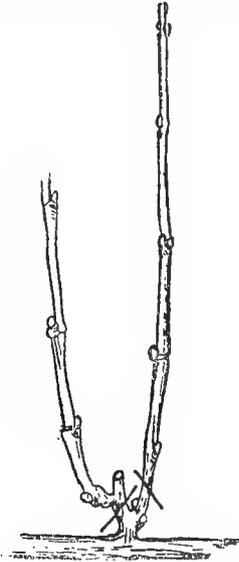
PRUNING.—The pruning of the first year consists in cutting the cane back to two “eyes” above the soil, choosing the better of the two to lay the foundation of the plant: in case of accident the other shoot can be made use of. For the following years, pruning is directed towards the formation of the frame, and the regulation of the shoots.

THE FRUIT GARDEN

The best time for pruning is the spring, sufficiently late to retard growth, and so diminish the risk of danger from frost. The cut should be at $1\frac{1}{2}$ cm. above the eye. In pruning the shoots it is necessary every year to cut those which have borne fruit back to two buds. Fruiting growths are pinched to one leaf above the bunch of grapes, other shoots from om.60 to om.80. In training the vine work with great care; the young shoots are very brittle. When a vine diminishes in vigour it must be manured, especially with potash manures, and it must be pruned back short in order to restore the vigour indispensable to its productiveness. The vine may even have to be cut down just above the soil. This induces the growth of a vigorous shoot,



PRUNING A ONE-YEAR-OLD
VINE SHOOT



PRUNING A VINE SHOOT, THREE
YEARS OLD

which is afterwards trained up to take the place of the weakened one. Annular incision sometimes gives finer bunches of grapes and hastens their ripening.

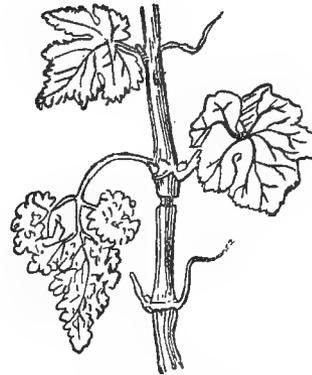
Let us first look to the formation, and we find that in the vine the buds are alternate, and that it bears fruit on the shoots which are produced by wood of one year's growth. The cordons are formed, of course, as each of the vines arrives at the height where it should bifurcate into the T. The T.'s in the "Thomery" form of training are formed by cutting to a bud at the height of the iron-wire, and by taking the bud immediately below for the opposite branch. This operation can also be done when the shoots are green.

The formation being acquired, every year a shoot on either side is taken.

The shoots are from om.15 to om.18 apart. Simple palmates are suit-



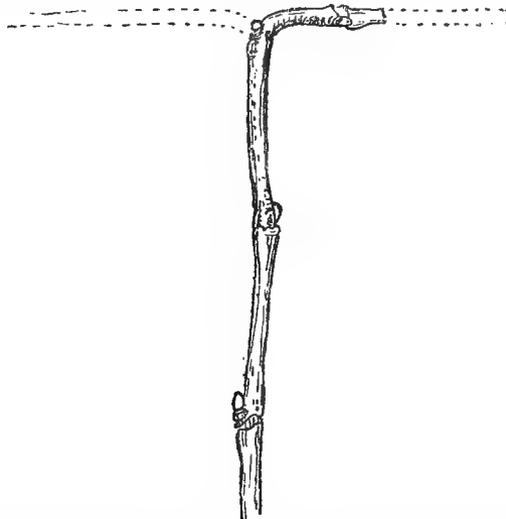
VINE SHOOT PINCHED AT ONE LEAF ABOVE THE BUNCH



ANNULAR INCISION

A ring of bark and tissue is removed below the bunch to hasten and perfect its development.

able for walls which do not exceed 2 mètres in height ; and alternate palmates



METHOD OF FORMING T OF THE VINE FOR THE THOMERY FORM OF TRAINING

The shoot beyond the bend is stopped to cause a bud at the bend to grow : this is then trained in. for those which are higher. The shoots are set up at from om.20 to om.25

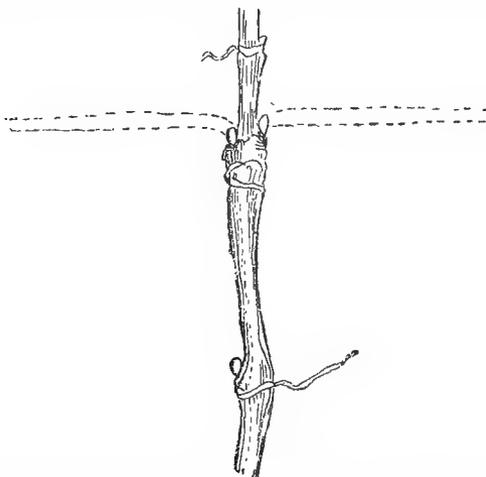
from each other ; and the first is at 0m.25 from the soil. One or two shoots are taken each year according to their vigour.

Horizontal cordons are obtained and treated in the same way as simple cordons.

As for varieties with long shoots, every year one growth should be trained in to produce fruit, and another should be cut down to two eyes in order to secure successional shoots. This cultivation produces much fruit, but vigorous vines are necessary ; and to secure them much manuring is needed.

Of all these forms the palmate is by far the most practical.

Grapes for the table are furnished chiefly from the southern regions, and



ANOTHER METHOD OF FORMING THE T FOR THE THOMERY FORM OF VINE TRAINING

By pinching the shoot a little below the T and training two growths from there.

next from the neighbourhood of Paris, especially from the districts of Thomery, Conflans, &c.

THINNING the grapes, which consists of removing with the scissors the inner berries, and of thinning those which are too close together, takes place at the end of June, and continues till mid-July. It serves to hasten the ripening, to increase the size of the individual berries, and to make their preservation easier.

GATHERING should be done in dry rather than wet weather. Bunches of dried grapes can be preserved by placing them upon racks, or by suspending them. Bunches of fresh grapes can be kept by inserting the stems in flasks of fresh water, with a little charcoal in it to prevent decomposition. In this case the grapes must be gathered with a sufficient length of shoot to fix them in the flasks and to enable them to draw up moisture. Double partition walls in fruit-rooms are even more necessary for grapes than for apples and pears. It is a good thing to burn a very little sulphur now and then to lessen the atmospheric moisture.

THE BEST VARIETIES FOR OPEN-AIR CULTURE

CHASSELAS BLANC ROYAL.—*Berry* rather larger than Chasselas Doré, and less coloured ; excellent quality ; mid-season.

CHASSELAS DORÉ DE FONTAINEBLEAU.—Vigorous, fertile ; *shoots* rather stout, long, yellow ; *bunches* large, elongated ; *berry* large, short stalk ; *skin* transparent, amber and plum-coloured ; excellent quality ; mid-season.

CHASSELAS HÂTIF DE MONTAUBAN.—Larger than Chasselas Doré, but amber white ; excellent quality ; mid-season.

CHASSELAS ROSE (Chasselas Rose Royal).—Vigorous, very fertile ; *shoots* rather long, thick, brown ; *bunch* medium, elongated, shouldered, not compact ; *berry* medium size, round ; *skin* pink ; excellent quality ; mid-season.

CHASSELAS ROSE SUPÉRIEUR.—*Berry* medium sized, excellent ; mid-season.

CHASSELAS VIBERT.—*Berry* rather large, white ; excellent ; mid-season.

DUC DE MALAKOFF.—Not very vigorous, fairly fertile ; *bunch* medium, shouldered, not well filled ; *berry* large, round ; *stalk* strong, short ; *skin* golden white ; excellent ; mid-season.

FOSTER'S WHITE SEEDLING.—Vigorous, very fertile ; *bunch* medium or large, shouldered, rather compact ; *berry* under medium size ; *skin* greenish white and yellow ; excellent ; mid-season.

FRANKENTHAL.—Moderately vigorous, fertile ; *shoots* thick, strong, deep yellow ; *bunch* very large, elongated, shouldered ; *berry* very large, round ; *stalk* rather long, beautiful violet black ; excellent ; late.

MADÉLINE NOIRE.—Very vigorous, fertile ; *bunch* not very compact ; *berry* small, elliptical ; *skin* violet black ; early.

MUSCAT PRÉCOCE DE SAUMUR.—Fertile ; *shoots* rather short, slender ; *bunch* small, cylindrical ; *berry* small, spherical ; *stalk* short, thin ; *skin* golden yellow ; early.

NOIR D'ESPAGNE.—Fertile ; *bunch* large, shouldered, rather compact ; *berry* large, spherical, deep black ; mid-season.

PARC DE VERSAILLES (Schaous).—Vigorous, very fertile ; *bunch* under medium size, oblong, compact ; *stalk* thick and short ; *berry* greenish white and golden, rather large, ovoid ; late.

PRÉCOCE MALINGRE.—Fairly vigorous, very fertile ; *bunch* medium, cylindrical, shouldered, very compact ; *berry* medium or small, ovoid ; *stalk* slender ; *skin* greenish yellow or golden ; early.

CLASSIFICATION ACCORDING TO TIME OF RIPENING

<i>Early</i>	
Chasselas Blanc Royal	Précoce de Saumur
Madeline Noire	,, Malingre
<i>Mid-season</i>	
Chasselas Doré de Fontainebleau	Chasselas Hâtif de Montauban
„ Rose Royal	Foster's White Seedling
„ Rose Supérieur	Noir d'Espagne
„ Vibert	
<i>Late</i>	
Frankenthal, Duc de Malakoff, Parc de Versailles	

CHAPTER XXX

FRUIT CULTURE IN THE CHANNEL ISLANDS

BY A CHANNEL ISLAND GROWER

FRUIT culture in the Channel Islands has been of long and steady growth, although at times its development has been startlingly rapid. In the remote past the culture of apples for cider, largely for export, was an important item with the Channel Island farmer. This has been steadily declining, cider orchards in more recent times having been ruthlessly cut down, and the land cleared for early potato culture. This for a time certainly held out better prospects, but, in its turn, has changed for the worse. Many who read of the vast export of fruit, vegetables, and flowers from these islands are surprised at its volume, and visitors who witness the long stream of carts and vans laden with produce wending their way to the quays are astonished that such little patches of land, well and carefully cultivated, can send so much to the mainland markets. Nearly every Channel Islander is, more or less, born with a taste for soil cultivation, and takes a most intelligent interest in the industry of the islands. This has proved to be to their great advantage; and we believe if a like spirit existed in England and Ireland, and if such a spirit were encouraged, England would be better supplied with home produce than she is at present, and considerably less money by many millions would annually be paid for foreign produce.

THE FIG

Figs have always been largely and well grown in the Channel Islands, in the first instance, of course, in the open air, before we exported fruit. In those days large trees were trained flat over wooden framework, varying in height from 4 feet at the front to 6 feet at the back. Many of these trees are still grown for supplying fruit in its natural season. When forcing came into favour many of these large trees were covered with glass, and in some instances pipes and boilers were employed. The increase of profit was of course very great, but many of the trees so treated died after a few years. This no doubt was largely caused by lack of water during the winter and early months of the year. A few large trees which would now be valued were actually cut out owing to prices falling for a time.

Some old trees under glass, however, are still doing well. But the new grower now generally grows pot plants, or small trees planted on the floor and trained over the roof. In the latter case root-pruning is found to have excellent effect in restricting excess of vigour. Generally speaking, the crop may be

looked upon as profitable. Figs are still not generally liked, however, so that it would probably be easy to glut the market. It certainly would not be wise for a grower to go in too largely for fig culture. Many varieties have been tried, but *Brown Turkey* alone appears to meet with general favour. It is found to be much the most reliable and productive.

THE GRAPE

It is safe to say that the grape introduced the Channel Islands as a fruit-growing district to the English markets, and it illustrates in a striking manner how pregnant with big results are sometimes those matters which appear of small importance at the moment. In a little book entitled "Culture of the Vine under Glass," by W. A. Crousaz, published in Guernsey in 1873, the last chapter is called "Remarks on Exportation." Mr. Crousaz was really the father of the fruit-growing industry as far as the Channel Islands are concerned, for it was he who, seeing grapes fit for the London market, set about surmounting the difficulties of delivering them. Had it not been for him the progress of the industry would at least have been delayed years. We have gathered the following facts from Mr. Crousaz's book.

INCEPTION OF THE INDUSTRY.—About 1847 a small quantity of grapes was sent to Covent Garden Market. In the same year a range of houses with boilers and pipes was erected as a speculation. The third season after planting (1850) the crop was about five hundred pounds. But the principal exporter declined to purchase, the quantity being too large, and further declared such a crop could not be disposed of at any price. The only alternative was to sell in the local market, but this proved a failure. So, after all, it was decided to try Covent Garden. But the mail-boat's agent declined to enter these goods, as the mails and passengers alone were allowed, and not cargo. The exporter determined that the grapes should be sent whatever the consequences might be, and a boat was hired, the fruit stowed beneath the seats, and then, rowing to the steam-packet, the packages of grapes were quietly handed over the side of the ship and placed out of sight while the crew were busily engaged with passengers' luggage and mail-bags. But each returning mail-boat brought strict orders that fruit should not be shipped unless cleared through the Customs. This was overcome by providing a printed form which had to be signed by the Lieutenant-Governor and a magistrate of the Royal Court (fee 2s. 6d.), and when complete taken to the Custom-House officials. It is disappointing to read that after so much determination the season closed with a loss, and as to prices Mr. Crousaz says, "arrived at Covent Garden, the fruit realised very little money, and that little was a long time coming." The season 1851 yielded a heavier crop; Covent Garden was again resorted to, and the same ordeal gone through, but prices were not remunerative.

In 1852 still finer crops were produced, and Covent Garden prices were rather better. So, when the forced crops were disposed of and cold-house grapes were ripe, growers, who hitherto had not known how to turn theirs into cash, were advised to try London. Mr. Crousaz here points out that only the choicest

portion of the crop was exported, the result being that the demand for Guernsey grapes increased, and nearly 3 tons were exported in 1855. So, we see, selection and grading were not overlooked in those days, though some growers of the present foolishly treat these matters with contempt. In 1857 4 tons were sent; in 1858, $4\frac{1}{2}$ tons, with good prices for first-class fruit; in 1859, 6 tons; and in 1860, 7 tons were sent, and the demand for good grapes had increased. This justified the erection of more greenhouses. In 1861, 9 tons, and in the following year 12 tons, were shipped, with steady prices for good fruit. In 1863 a fair quantity was grown, but owing to shippers and salesmen having so increased, the market was occasionally glutted, and prices were consequently less. The regulating of the market was now out of the question. It was feared this state of things would diminish the value of the fruit; so the original exporter visited Paris, hoping to find a market there, but the prices would not have been remunerative, and the quantities required were too insignificant to justify the attempt.

FORMER QUANTITIES.—In 1864 the quantity sent was 12 tons, and, other fruit being scarce, steady prices were obtained. In 1865 the prices were not so good, good grapes selling at 9d. per lb., the depreciation being attributed to glutted markets. In 1866 about 16 tons were sent, good prices being realised from the commencement of the season, selling at 1s. 6d. to 2s. per lb. These prices continued till the month of August, and, owing to scarcity of other good fruit, prices were maintained throughout the season.

In 1867 the season opened well, but owing to an over-supply the prices did not hold firm. In many instances good grapes, after remaining some days on hand, were sold for 6d. and 8d. per lb. Mr. Crousaz here quotes a market report, which states “that from the number of houses recently built and in course of construction, the quantity of grapes will considerably increase and prices probably fall; and that as the English, and particularly the Scotch, are developing this branch of fruit culture to a large extent, we may reasonably suppose many towns will cease drawing their supplies from London.”

The total quantities exported after 1867 are not given, but referring to the season 1871 it is stated that the quantity sold by one salesman was $21\frac{1}{2}$ tons, independently of what was sold elsewhere. In 1872 the prices were very satisfactory. Early cold-house grapes obtained 1s. 9d. to 2s. per lb., choice fruit even higher. Grapes of inferior quality made as much as the greater part of the best had done in 1871. The crop, however, was much lighter, as 216 houses only produced $16\frac{1}{2}$ tons, whereas 200 houses the previous season produced $21\frac{1}{2}$ tons. Since the publishing of Mr. Crousaz's book, grape culture has gone ahead; but it is now impossible to know the quantity exported, as the growers nearly all consign directly to the British markets.

VINE BORDERS.—The vines in the Channel Islands were formerly nearly all in outside borders. Muscats and all others were treated so. Now, however, many are planted in inside borders. Some houses have arched walls so as to allow a free passage for the roots to either inside or outside borders, but the majority are still outside. When grapes were first cultivated for market, and since, borders in many cases were much too deep. Then, later,

many growers troubled little how the border was made ; but now more care is taken in this matter, and nearly all methods have been tried. The English horticultural press has been closely read by the local grower, and he has tested nearly everything suggested, from carrion to hot-water pipes in the border ; both of these he has long since abandoned.

VINERIES.—Formerly lean-to houses were considered best, but now large span-roofed houses are the most in favour. A larger area of land can thus be covered at less expense than with the lean-to. Considerable expense in wall building is thus avoided. Of course, more piping and heavier firing are required, for the solid walls of the lean-to keep warmth better in cold wintry weather.

VARIETIES.—Nearly all new varieties have been tried as they appeared. The majority, however, have proved failures so far as suitability to market culture is concerned. The following may be taken to represent the standard sorts grown in the Islands:—*Black Hambro'*, *Muscat of Alexandria*, *Black Alicante*, *Gros Colmar*, *Gros Maroc*, *Appley Towers*, and *Canon Hall Muscat*. This last is not yet largely grown, but many good growers consider the local conditions as being peculiarly suited to this variety, and hold that, space for space, it will be among the most profitable grapes. If the hope is borne out by results, there is no doubt *Canon Hall* will find plenty of growers ready to take up its culture. At present the majority view it somewhat as a "will-o'-the-wisp variety."

PLANTING.—Formerly the canes were planted much too thickly (in some cases 15 inches apart), with the natural result that the fruit grown was of poor quality, and as the vines aged so the quality was worse. Now, however, in the majority of cases this evil has been corrected ; more space is afforded each cane, although many say that more room still is required. But the grower has to consider this with the present prices of grapes. He must have a fair crop of grapes or the vinery will not pay ; indeed, the prices of inferior grades have already fallen so low that they leave no profit to the producer, so that in many cases the vines have been cut out and the houses turned over to tomato culture. This winter (1902) many more vineries were about to undergo the same treatment. Without doubt this is a wise course as far as the grower is concerned, for the only use of inferior grapes is that they occasionally have been the means of introducing a new retailing customer, who may ultimately become a buyer of the best article. Though this is poor satisfaction to the grower of inferior grapes, it will be beneficial if it helps to increase the retail market.

THE MELON

The cultivation of melons for market purposes was, we believe, practically introduced into the Channel Islands by Mr. James Davis, at one time gardener to the Rev. J. Watson, at La Favorita, St. Martin's, Guernsey. At the commencement of this new branch of the industry, small houses with sharp pitched roofs and plenty of piping were employed, and the results were highly satisfactory to the grower. As time went on, larger span-roofed houses were planted with melons, and the plants trained up trellises almost as with

tomatoes. While small houses had a good arrangement for bottom heat, the larger spans had no such provision. Heavy crops were produced by either system ; for very early gathering the small house is better. Melons are still largely grown, and in many instances very profitably, though now the profits are less than formerly. The varieties grown are several, and many new ones are tried, but most are the same as those first grown by Mr. Davis, without doubt a selected form of the old Golden Perfection.

In the years following the introduction of melon culture for market, a good profit could be relied upon. Prices were high and very steady, but as more growers began the prices commenced to fall, and it is now not unusual to hear of a melon crop being a failure so far as profits are concerned.

When melons were first started many growers used to allow one plant to cover a good roof space by taking several shoots from it. This is still favoured by some, but the majority now prefer single or double-stemmed plants with the idea of getting a small number of fruits on each, and gathering a crop rapidly so as to allow time for a second planting. In favour of the extension system it is argued that the greater energy of the plant promises better "setting," and that if the plants remain healthy their fruiting season is longer ; but the risk is that the stem may canker at the soil level, whereas with the single or double leader system the risk is much less, as the life of the plant is only half as long. Anything which tends to reduce the risk in a melon crop is looked upon with favour by the Channel Islanders, as the margin of profit is very different now to the days when a good melon would make five to eight shillings at the end of June, as was the case eighteen or twenty years ago. Those were, of course, the early days of melon culture in the Channel Islands.

PEACHES AND NECTARINES

Peaches and nectarines were soon taken in hand by the grower when the fruit-growing industry was in its early stages. It was at first thought the peach might be made to yield fruit while the vines were growing. Naturally, it was planted against the back walls, for in those days the span-roof was not in such favour as it is to-day. Peaches and nectarines were almost entirely grown on the single cordon system—hard pinched in summer, and strictly kept as cordons. But such culture was not a great success, consequently many growers allowed more growth, and this very naturally led them on to the extension system. To-day, in most instances, fan-trained trees are the most approved, and rightly so, for without doubt their yield is greater and more reliable, and the life of the trees longer.

Although peach and nectarine culture was commenced so early in the Channel Islands it has, to a very large degree, diminished. This diminution largely arose from the difficulty the grower experienced in placing his fruit on the British markets in a sound condition. All methods of packing were tried, but the uncertainty of safe and sound arrival still existed, and the culture considerably decreased. We do not mean that none were grown, but it got less popular, and would very probably have disappeared had it not been for the

introduction of the fruit-packing cases (referred to elsewhere). When these valuable cases entered the field, the chief trouble so far as safe delivery was concerned gradually disappeared, with the result that the culture of peaches and nectarines is yearly more favoured by the Channel Island grower. He has plenty of sunshine, and a soil suited to the requirements of the peach except that it contains no lime. (The analysis of Channel Islands soil shows but a trace of lime; it is, indeed, imported from England for building purposes.) But except for the absence of lime, the Islands can grow peaches and nectarines well under glass. We say "under glass," for, as a matter of fact, they are very uncertain when grown in the open air. Open-air culture fails probably from no other cause than that the climate is very unreliable and varied in the late winter and early spring months. It is no unusual thing to have such weather at Christmas which would be welcome at Easter, and *vice-versâ*. Plant life is thus encouraged at the wrong season. Jersey, however, appears to be distinctly more favourable to peach and nectarine culture in open air than Guernsey.

Early varieties are best suited for culture in these Islands; such as are of good size and highly coloured should be chosen.

THE PEAR

Pears have been for many years, and are still, very well grown in the Channel Islands.

This is particularly so in Jersey, where the culture has of late received much more attention than in Guernsey. Formerly the variety Chaumontel was extensively grown in the latter island, but now many walls that formerly were devoted to pears have greenhouses against them and the pear trees have disappeared.

From Jersey, however, large quantities of good pears find their way to England. A fairly large collection is cultivated, but such sorts as Williams', Chaumontel, and Doyenné du Comice, are those usually grown for market. The production of these fruits will probably increase as time goes on, for without doubt that excellent variety, Doyenné du Comice, can be given all it requires in the Channel Islands.

THE TOMATO

The tomato has played certainly the most important part in the development of fruit culture in the Channel Islands. It did not initiate the industry, it is true, but when growers started with the object in view of growing grapes only for the English markets, they knew they would have to wait two or three years before they could hope for any material benefit from their outlay.

Potatoes were planted on the floors of the houses, and frequently gave very satisfactory returns—from 1s. to 2s. 6d. per lb. being realised. But this crop had one great drawback—the houses being unheated, scarcely any provision could be made against frost, which frequently destroyed the plants. Some

growers used large oil lamps distributed over the house, but the crop was not even then quite safe. This went on for some years, when it occurred to some growers to try another ground crop on the floors of their houses (after the potatoes were dug), during the two or three years before the vines were established. Now the only crop likely to succeed was the tomato. And it was found that a very good return could be obtained within a few months of having built a glass-house. The returns, indeed, were so remarkably good that it became easy, while prices for tomatoes ruled high, to start a range of glass-houses for market purposes with comparatively little actual capital.

BUYING LAND.—It frequently happened that the land could be bought in what are locally called *Wheat-rents* or *Quarters*. The wheat-rent is a system in the Channel Islands which answers much the same purpose as the mortgage does in England. It represents a capital value of £20 sterling secured on the property, and the annual payment of £1 by the debtor. But so long as this annual charge is paid the wheat-rent holder cannot demand repayment of this capital from the owner of the land. If he wishes to realise his wheat-rent, he may offer it to the landowner, or he may sell his security to any other buyer. Of course, the prices asked for land under such conditions and with such prospects were very high in comparison with the price such land could yield from ordinary agricultural treatment. But as the prospective small grower would only require an acre or so, he was not daunted by having to pay, say, double its agricultural value: he even frequently paid more than double; so that, supposing its agricultural letting value was £7, 10s. an acre per annum, he would, by buying in wheat-rent, be willing to undertake to pay £15 per annum in perpetuity, but he really often paid £20. The quantity of land he required was so little that he deemed himself safe in paying for the accommodation.

BUILDING.—Having secured the land, then came the question of building houses. The difficulty, however, was not serious if the grower was a man considered to be reliable. Timber merchants were at hand ready to take some risk, and the glass merchant as well, with the result that the grower frequently found himself selling his tomatoes even before he had paid the cost of installing himself as a grower. While prices were high the grower was on pretty sure ground; and many growers of to-day can trace their beginnings and final good results to taking advantage at the right moment of the opportunities which then occurred.

ADVENT OF DISEASE.—Tomatoes were in the first days of their culture always planted on the floors of the houses, and the results were all that could be wished; but as time went on, and this crop continued to show good profits, many houses were built for tomato-growing only. This meant the same crop year after year in the same soil, with the result that frequently the plants became diseased, and very uncertain and unsatisfactory were the returns. Removing the surface soil and replacing with fresh soil were tried, and in many cases proved successful, but this was not a certain cure. And in time the soil became a perfect hotbed of disease. Of course, some soils gave out sooner than others. That which was high and well-drained usually broke down, especially if allowed to become dust-dry in winter, sooner than lower lying land, which is usually



A MARKET VINERY IN THE CHANNEL ISLANDS.



FIG CULTURE IN THE CHANNEL ISLANDS, SHOWING TREES TRAINED OVER
HOUSE ROOF.

richer in organic matter and less likely to get dry during the winter months. Excellent crops are frequently grown in soil which is almost pure sand, and this remains healthy longer than might be expected, especially if well watered in the winter.

POT CULTURE.—The grower had to practise some other method, and tried pot culture. Pots of 8 inches or 12 inches diameter were used. As a result he has very materially benefited the output. Of course, fresh soil is used for potting purposes, and this is well prepared during the previous season by frequent turnings. But the Channel Island grower has not the broad acres of England at his command for fresh loam, so he has to use largely the same soil over again mixed with what fresh material he can obtain. He gives it a certain period of rest in the open air, mixing with it well-decayed farmyard and artificial manures.

VARIETIES.—As to the sorts of tomatoes grown or tried, it is really almost a complete list of the numerous varieties introduced. And it is very doubtful whether any sort is introduced without being soon after tried and tested by the Channel Island grower. The old large red, selections from *Chemin Rouge*, *Up-to-Date*, *Stirling Castle*, *Sutton's A-1*, *Comet*, *Winter Beauty*, *Lawrenson's No. 3*, *Holmes' Supreme*, *Bonnie Dundee*, *Sarnian*, *Lister's Prolific*, *Jersey Industry*, &c.; in fact a very complete list, added to which, of course, local selections. But for very early work the old large red meets with very general approval. We find that carefully selected forms of this variety set more freely than most of the smooth varieties. And this we insist on, in spite of the salesmen continually pointing out that smooths are most in demand. The grower finds that a heavy crop of selected old reds pays him better than a light crop of smooths, though the latter may sell at a penny or two more per pound. This obtains early in the season, when the supply is below the demand. But when the tables turn, and the buyers are able to be choosers, then the Channel Island grower has to leave his old friend the corrugated and take to the smooth, in one variety or the other.

WHEN TO PLANT.—Another trouble the grower has yearly to deal with is when to start his tomato crop. If the fires are started early, there may be a long spell of wintry weather and little sunshine. This means hard firing, burning expensive coal for plants which grow and grow, and fill the house with foliage, but very little fruit. In fact, we have heard of cases where plants had to be rooted out, and a fresh start made with new plants. If, on the other hand, he starts late, and it happens that the summer following suits tomato culture in the open air, then he finds his prices so low that the balance in his favour is almost nil. As it is impossible to tell what the coming season will be, the grower is quite helpless, having no guidance afforded him by past experience on this particular point. For instance, the year 1901 so suited open-air tomatoes that the prices fell to ruinous figures, and the late-started houses suffered considerably by the abundance of the open-air crop; whereas the summer of 1902 was disastrous for the open-air fruits. Consequently the prices were exceptionally good, and the growers who started late did well. Where it is decided to start the tomato crop comparatively late, the grower is able to use his house either for peas or beans, and secure a crop before planting

tomatoes. The grower who forces hard is not able to do this. But we repeat that the advantage of either system rests entirely with the character of the summer which follows. So if the grower has a fair-sized establishment, he usually plants part under one system and part under the other, and this is by far the safest plan.

OTHER CROPS

The Channel Island market-grower, though he goes in most strongly for fruit and vegetables in demand on the British markets, will generally be found to have some other crop under his care, such as flowers. These are found to bring in money in the dull season when there is no fruit for sale. This season is from the late autumn to winter and early spring. He therefore grows arum lilies, freesias, narcissi, and some foliage plants, as asparagus, and in some instances smilax, which, under good culture, may be regarded as a profitable plant. Smilax in pots is frequently made to follow an early tomato crop.

ARUM LILIES are also largely grown to follow the tomatoes. Formerly very good profits were made with this plant, but now many more growers have taken up the culture, and the prices are lower and the profits smaller. Some growers approve the drying-off system, giving the plants a rest, while others prefer to keep the plants growing the whole season through. But even in the latter case the plants do receive a rest, though it be as a severe check, for when the spring comes and prices fall, the plants are turned out into the open air while in flower and bud. It is no unusual sight to see such lots standing outside the greenhouses making a strong effort to adapt themselves to circumstances. It is probably due to this treatment that we hear frequent complaints of the scarcity of blooms the season following.

FREESIAS are well and largely grown; for forcing purposes they are usually planted in wooden boxes or square earthenware pans. They require to be planted early in the summer, placed outside, and induced to start so as to secure short, broad foliage by the autumn. When they are well developed they are placed under glass, and after a week or two given slight heat. They can thus be had in bloom early in the new year. Freesias can also be planted near the front lights of lean-to and span-roof greenhouses beneath the vines, and if care is taken with the watering they bloom well.

NARCISSI are chiefly grown in boxes, planted early in the summer, kept outside till thoroughly well rooted, then placed under glass and forced according to circumstances. This is a branch of flower culture which the Channel Island grower will probably increase considerably in the near future.

SPANISH IRISES are also grown very largely; some are boxed and forced, others are planted on the floors, mostly of cold (*i.e.* unheated) grape-houses. The profits on irises are very variable. The essential thing is to have distinct colours and bulbs which will yield a large percentage of flowers, otherwise a loss is certain.

CHRYSANTHEMUMS of varieties suited to market purposes are also largely grown, some entirely in the open air; others in the open are lifted in the

autumn, while some are grown in pots. The last mode of culture is not largely followed, growing in pots necessitates a good deal of labour in the summer months, when the grower has his hands full enough.

ORCHIDS are receiving consideration at the hands of some Channel Island growers. *Cypripedium insigne* is most largely grown, but some have a fairly representative collection suited to cut-flower trade.

FRUIT CASES

When fruit-growing for market commenced, and long afterwards, the great difficulty that faced the grower when he had his fruit ready for market was the sea passage to Southampton or Weymouth, in addition to the railway journey. After seeing the way in which the produce was hurled into the hold of the steamer, to suppose that after such treatment the fruit could arrive at its destination other than seriously blemished would be absurd. Then the railway companies had a uniform charge of so much per basket of grapes, heavy or light. Two shillings each was the price, and whether the basket contained 7 lbs. or 27 lbs., it was always 2s., with, we believe, a maximum limit of 28 lbs. It is safe to say that had these conditions continued till now, Channel Island grape-growing would almost have disappeared. It was long felt that some better system was urgently required to save the situation, and ultimately Mr. J. H. Parsons, of Guernsey, invented large fruit cases, wherein could be placed a number of shallow baskets containing choice fruit, freshly gathered, and conveyed to London undisturbed. To this invention may safely be credited the success of the Channel Island grape grower. He now places his goods in the hands of the local forwarding agents in open baskets, and he knows they have every possible chance of arriving in practically the same condition as he left them. So good an idea naturally produced many imitations, with the result that to-day there are many fruit cases of a somewhat similar type. They are, however, no longer restricted to grapes, but are used for all kinds of choice produce.

FUEL

The fuel consumed in the Islands for cultural purposes is a very serious item. The grower is often called upon to pay exceedingly high prices for his anthracite coal.

This evil has grown during the last few years. As to the Welsh coal prices have gone up. A few years ago it could be bought free on the quays at 16s. 8d. to 18s. per ton, whereas now it occasionally runs up to 35s. and even higher prices, especially in Guernsey where the local harbour dues and wharfage are higher than in Jersey. In the former island the wharfage is 2s. 6d. per ton, which all growers consider an unfair tax. For several years past the Guernsey Growers' Association have worked diligently to secure a change in this matter. And though up to now they have received no actual benefit, we find there is a growing consensus of opinion among the governing

bodies of the island and the public in general that it is not wise to continue to burden so heavily this great industry.

For the wider view of the fruit-growing industry taken by the governing bodies thanks are due to the local Growers' Association, and it is likely that in the near future some material relief will be afforded. This certainly would be most welcome, as of late the grower has had an additional burden by having to pay the one shilling duty on all coal exported from Great Britain.

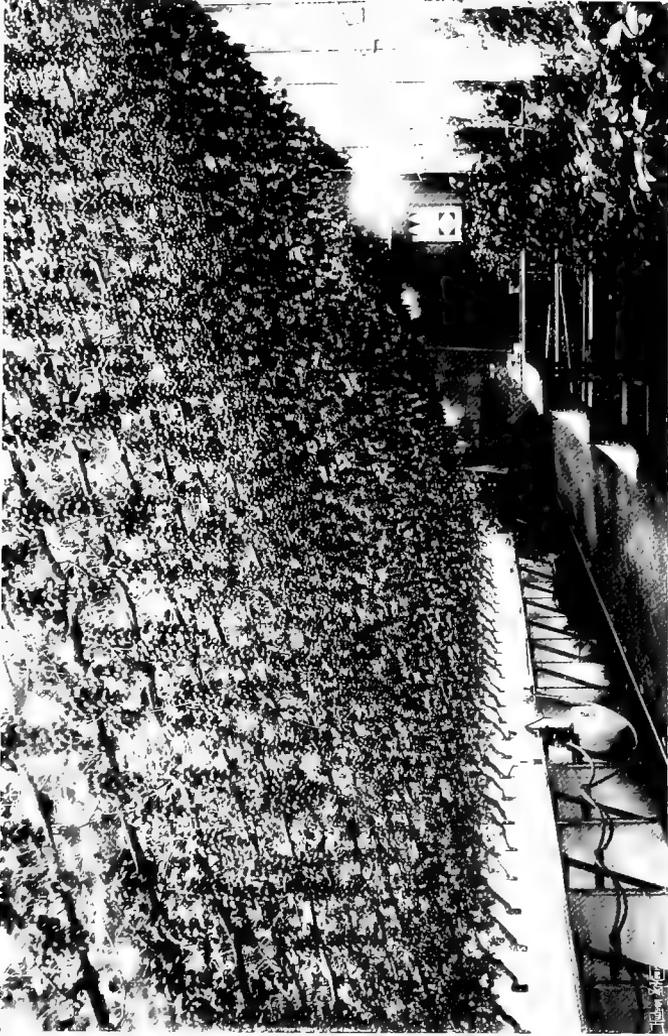
The local growers did hope they would have been exempt from this tax ; the home authorities were approached, but the claim was disallowed. This additional tax still further justifies the grower's plea for relief. The cost of production is gradually increasing, without any promise of better prospects. The market value of the produce is gradually but surely declining, and the grower views with apprehension the time in the near future when his present margin of profit may be entirely swept away, and give place to a balance on the wrong side. The situation is certainly one which demands most serious and generous consideration.

PROSPECTS

Twenty years or so ago quite a number of limited liability companies were floated, and in the majority of cases were sore disappointments to the unfortunate shareholders, and with very few exceptions failed to redeem anything like the promises of the prospectus. Fruit-growing for market in the Channel Islands, as elsewhere, depends upon the grower's personal attention. These islands are particularly the field of the *working grower*. The man who can and does devote all his time, thought, and energy to the work will probably succeed. But the man who decides to enter upon a venture as a fruit-grower here, and thinks he can be industrious and energetic by proxy will experience failure and disappointment, and the disappointment may not be the most serious part of the venture.

The French have a proverb which says, "It is the master's eye that fattens the ox," and by deduction it is prudent advice to say, that unless the master has an eye and is willing to use it, he had better give up the idea of fattening the ox. If you make up your mind to start fruit-growing in the Channel Islands, you must at the same time make up your mind to work yourself, and not by proxy.

We have no desire to daunt any one who is prepared to be thorough and honest with himself, but the evidence of failure through lack of these qualities is so abundant in the Islands, that we cannot refrain from giving expression to the above facts. A little capital, plenty of energy and diligence, may bring success, but much money without the diligence and application of the proprietor is in imminent danger of being lost. Insolvency is not a condition unknown among the Channel Island fruit-growers ; many instances exist where men have signally failed through no other apparent cause than the lack of those qualities which are necessary to make the business a success. It is safe to say, that unless the grower can depend upon himself he had better by far abandon



A CHANNEL ISLAND VINERY.



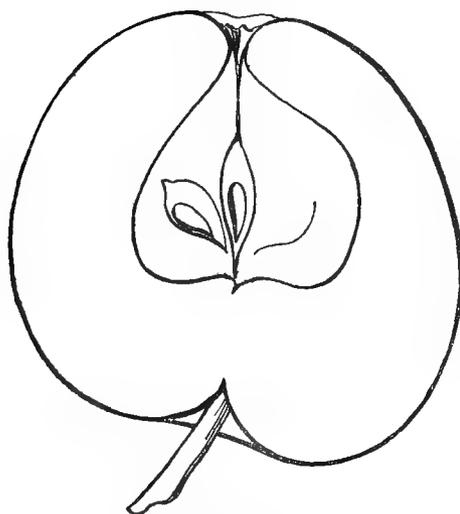
HOW MELONS ARE GROWN IN THE CHANNEL ISLANDS.

the idea of fruit-growing in these Islands. If the past has shown many cases of failure it is quite certain that the future, and the near future, will produce even more ; for as the margin of profit declines so will weak places show themselves in greater numbers. The industry now has passed its golden days, more than ever is caution required by those who contemplate putting money and time into it. All that can be said of it now is that it offers a good living to the grower who is willing to work.

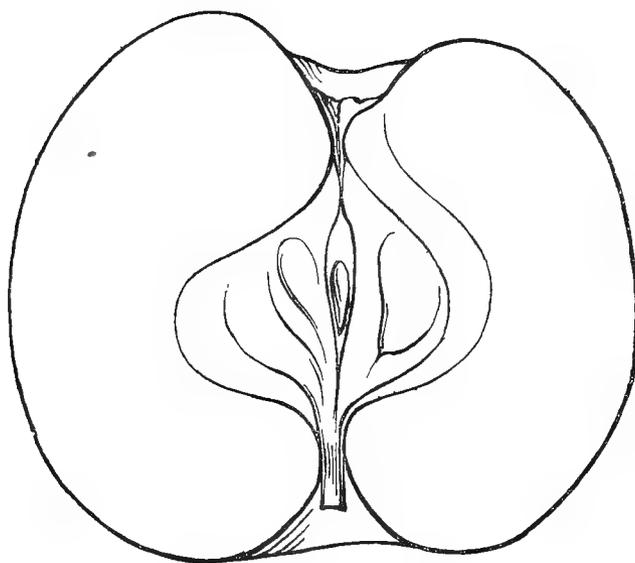
As a further aid to the identification of hardy fruits, it is hoped that the following outline drawings will prove useful. Those of Apples, Pears, Plums, Cherries, and Gooseberries have been prepared from orchard-grown fruits, and do not therefore represent the size to which the same varieties will attain when cultivated in rich garden soil ; together with the drawings of Peaches, Nectarines, Strawberries, &c., they may be taken to show the actual size of the fruits when given ordinary culture. Unless it is otherwise stated, these outline drawings are the exact size of the fruits from which they were made.

APPLES

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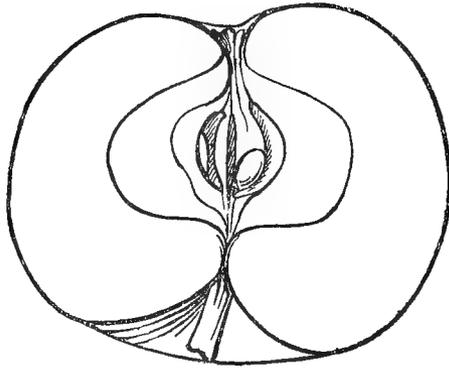


Adam's Pearmain

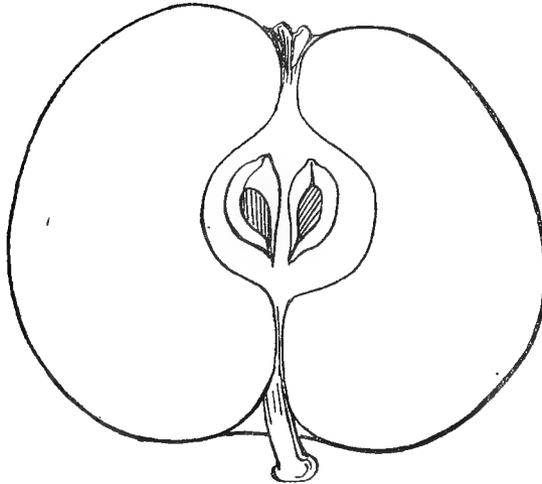


Alfriston

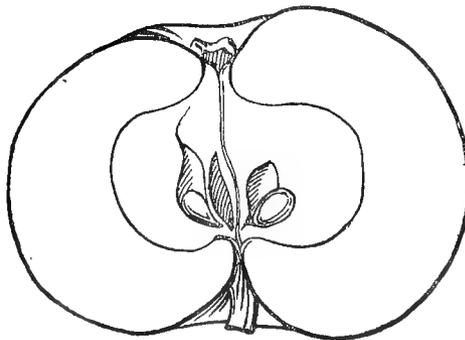
APPLES



Allen's Everlasting



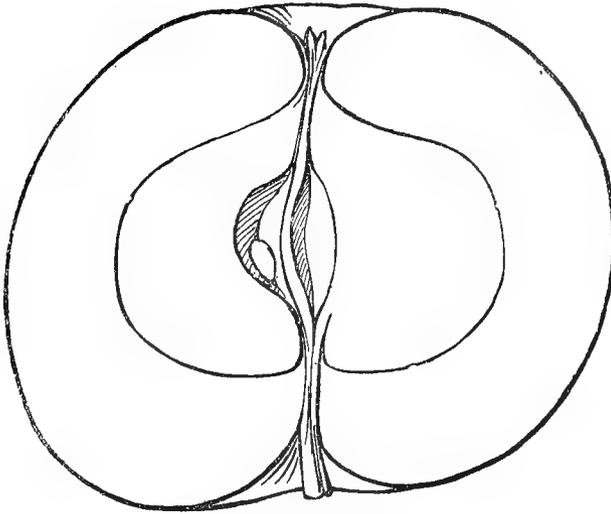
Allington Pippin



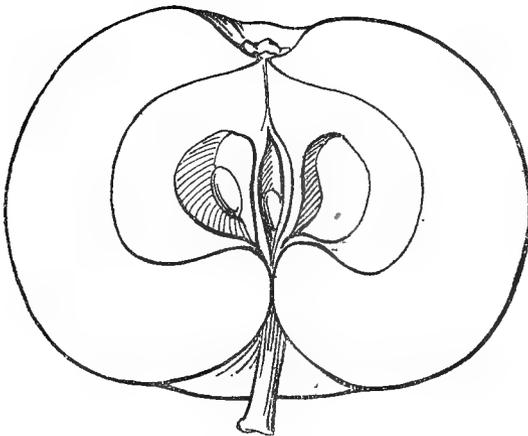
Beauty of Bath

APPLES

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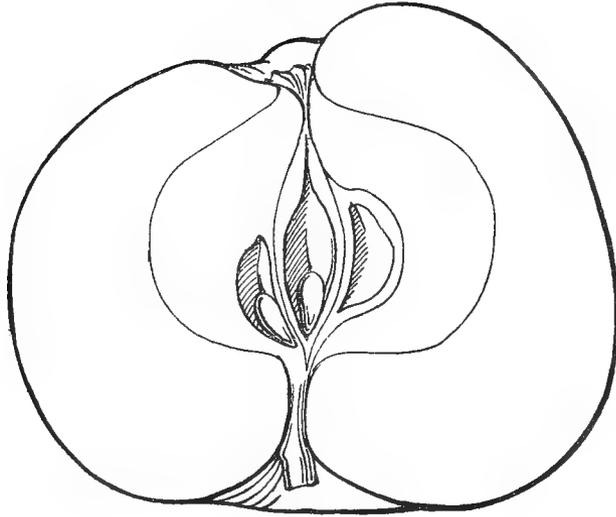


Annie Elizabeth

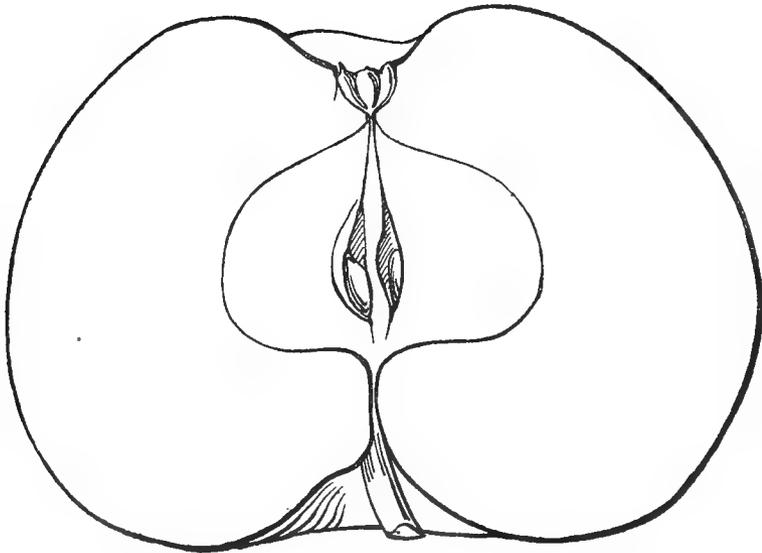


Baumann's Red Winter Reinette

APPLES

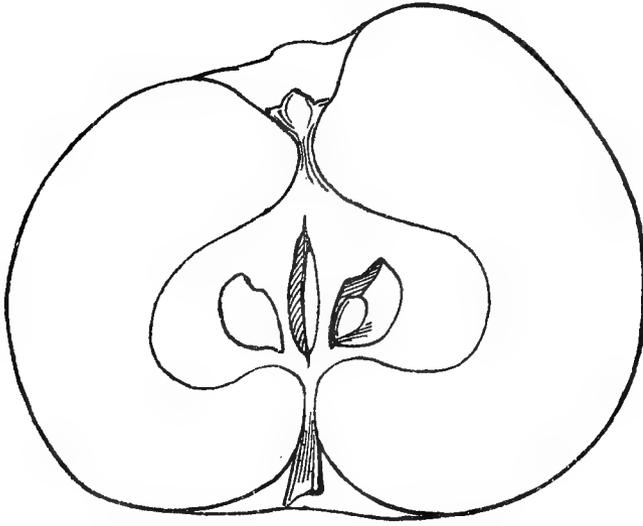


Beauty of Kent

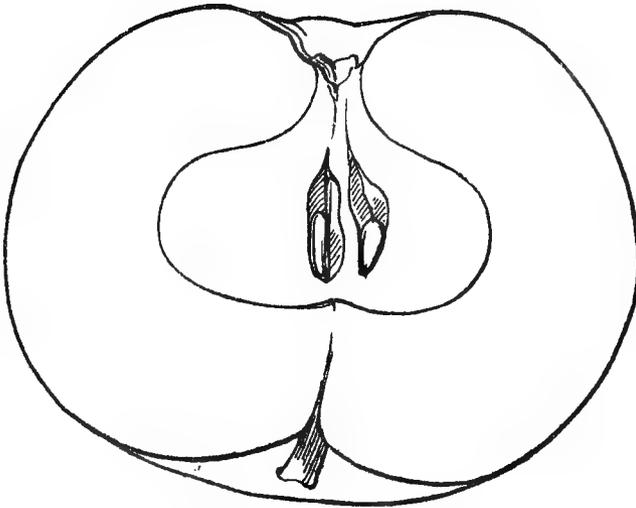


Belle Pontoise

APPLES

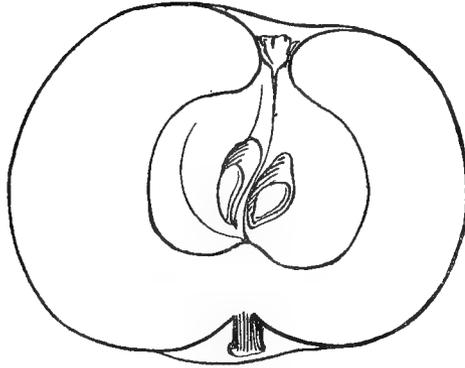


Bismarck

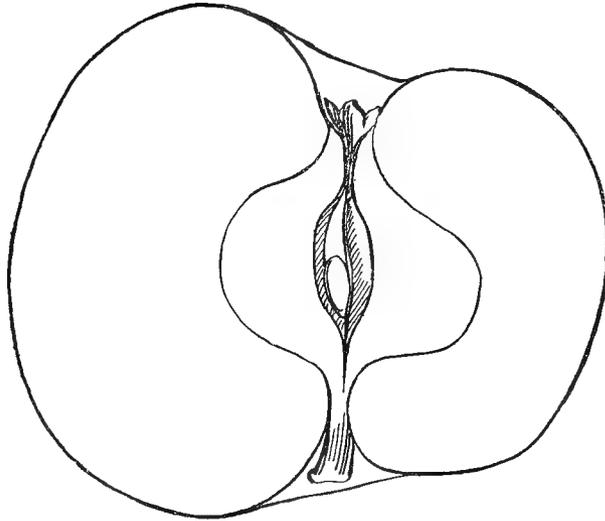


Blenheim Orange

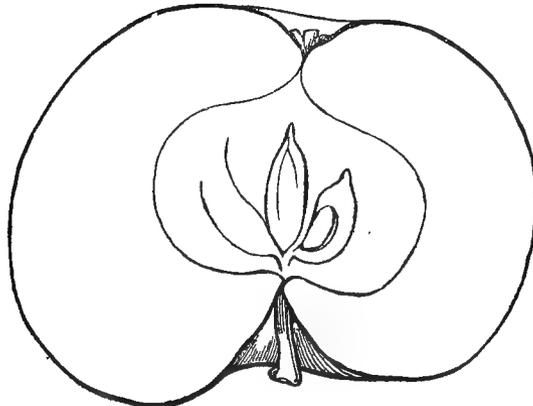
APPLES



Braddick's Nonpareil

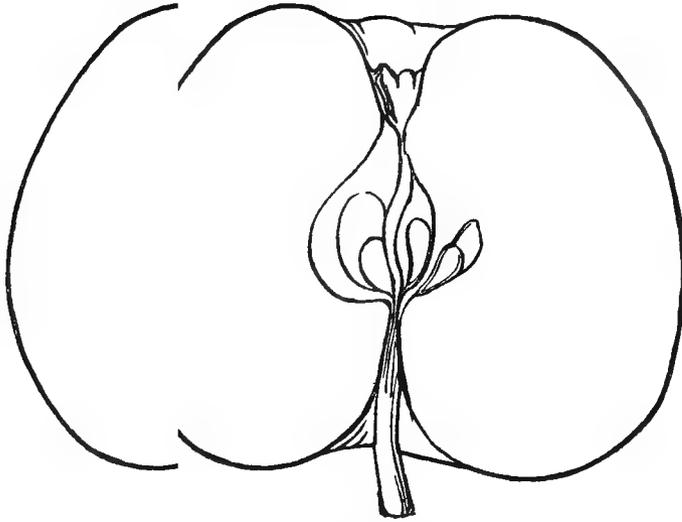


Bramley's Seedling

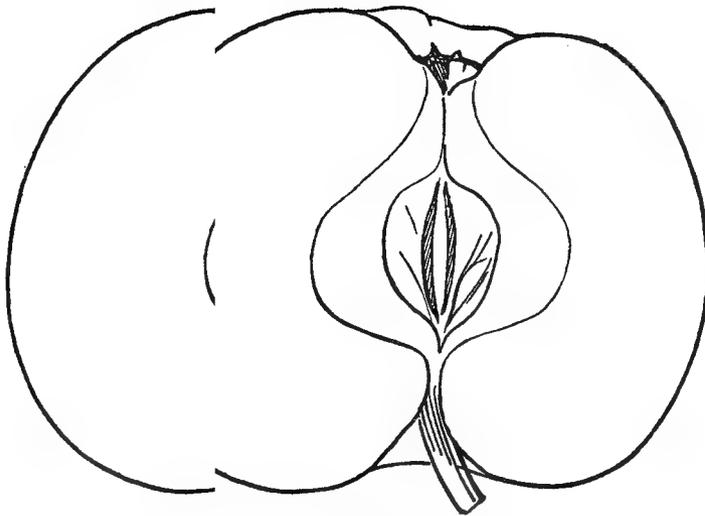


Brownlee's Russet

APPLES

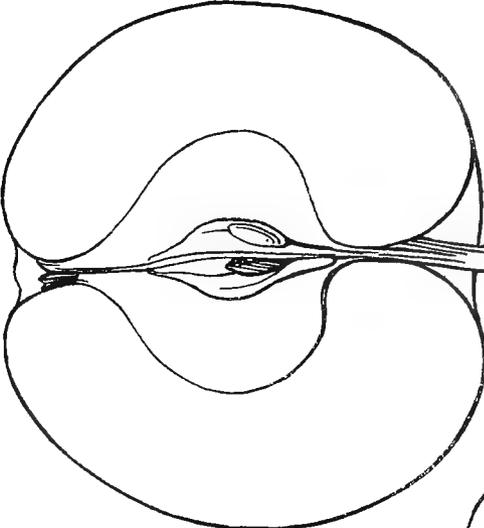


Calville Blanche

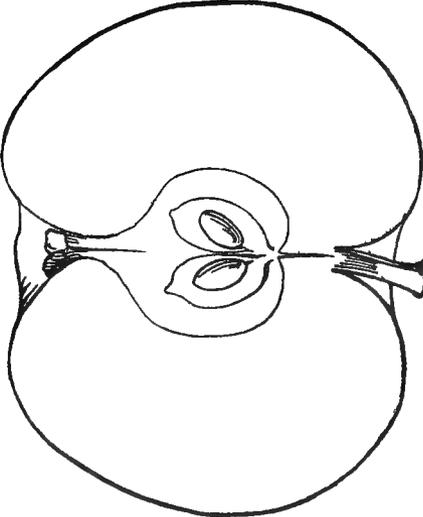


Calville Malingre

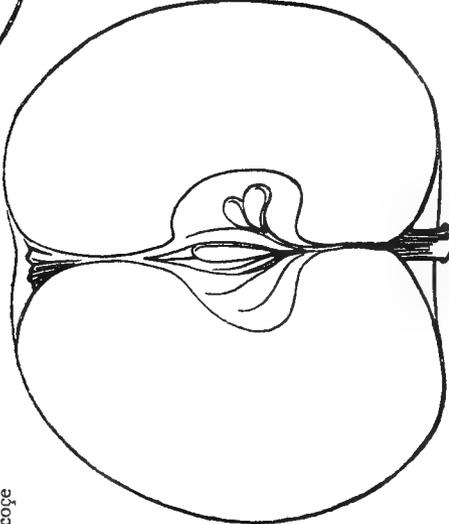
APPLES



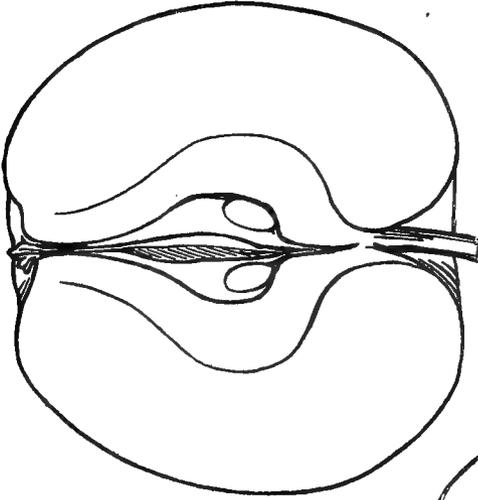
Calville Rouge d'Hiver



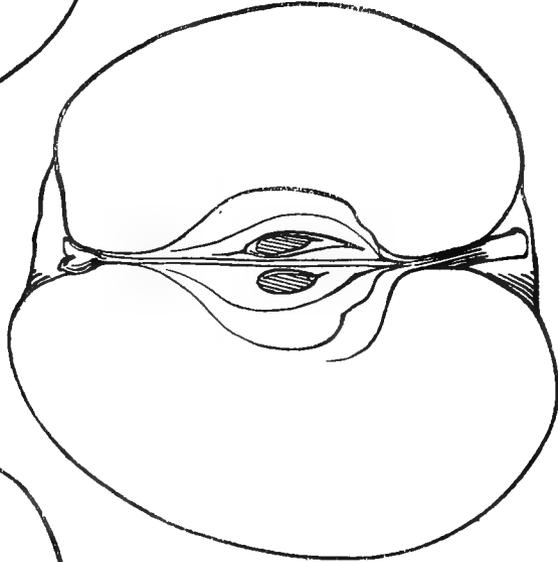
Calville Rouge Précoce



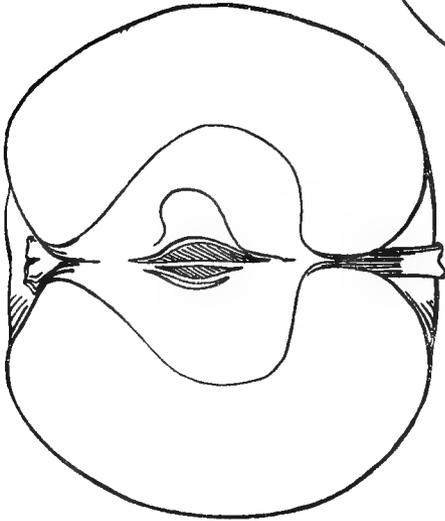
Cardinal



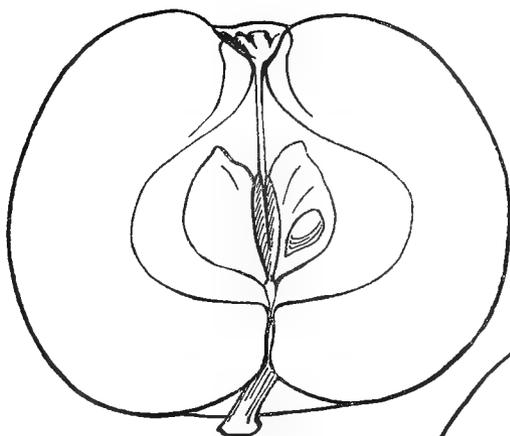
Christmas Pearmain



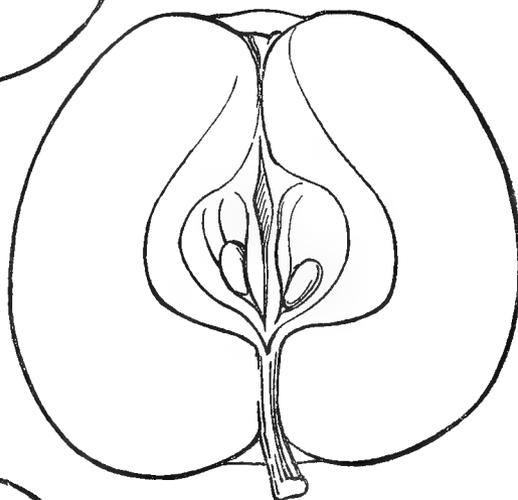
Chelmsford Wonder



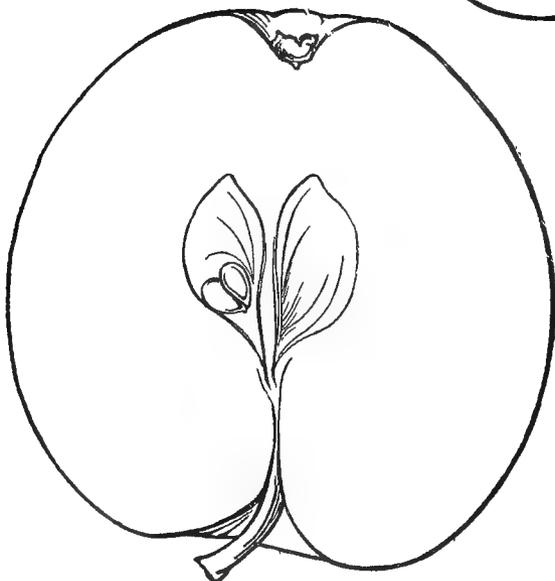
Cellini Pippin



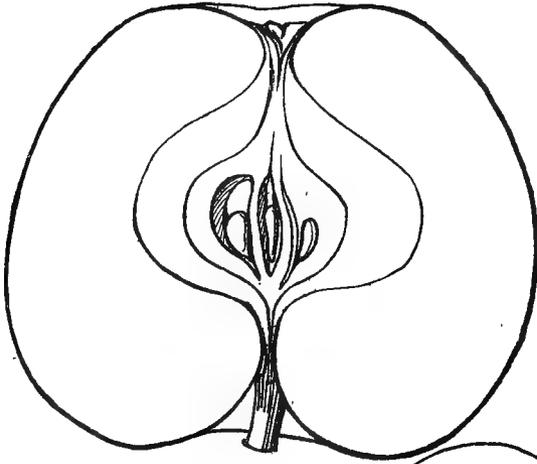
Claygate Pearmain



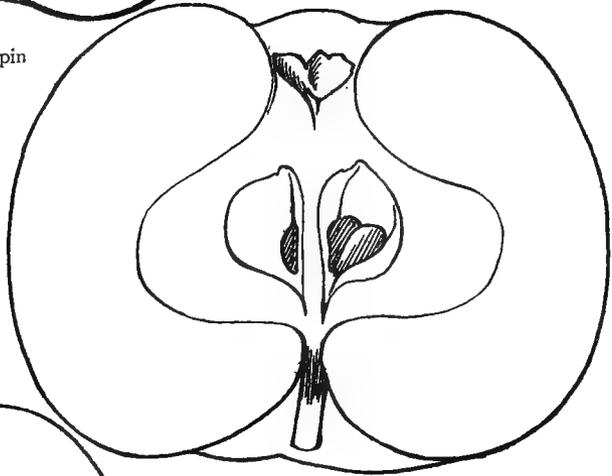
Cockle's Pippin



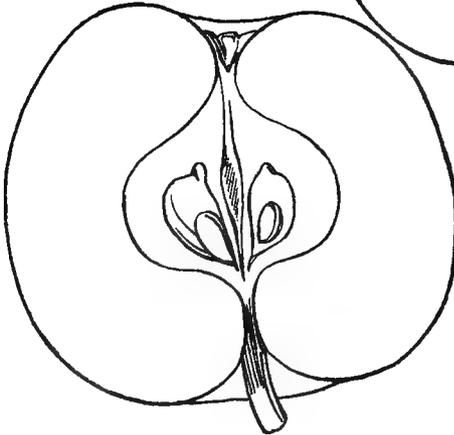
Cornish Gilliflower



Cox's Orange Pippin

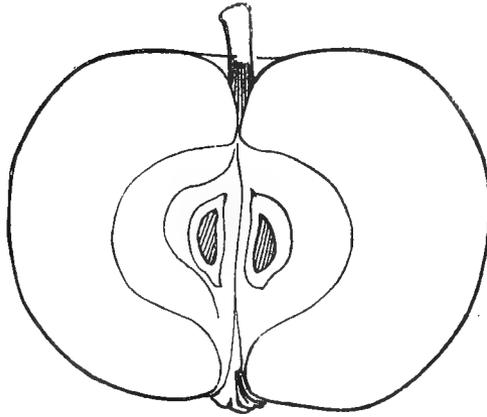


Cox's Pomona

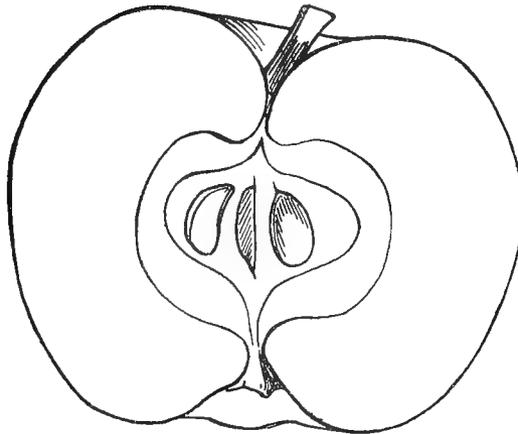


D'Arcy Spice

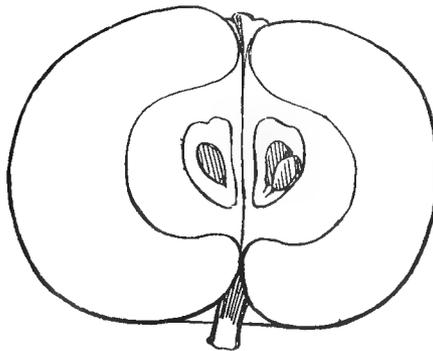
APPLES



Devonshire Quarrenden

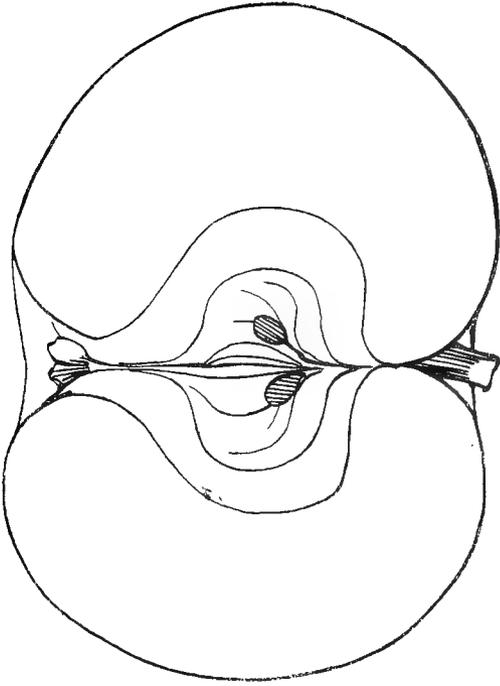


Duchess of Oldenburg

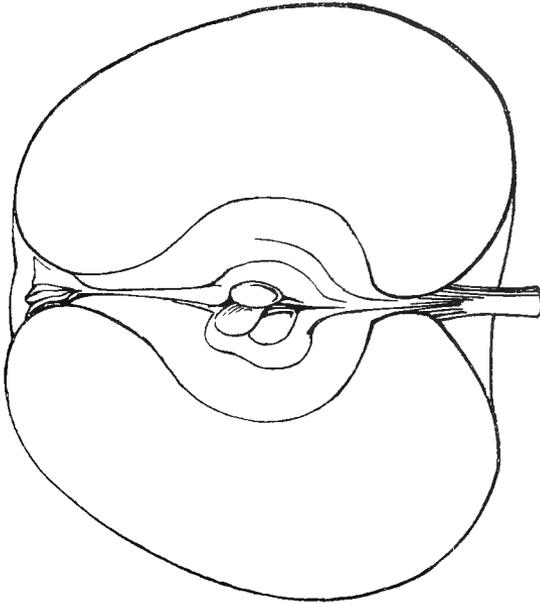


Duke of Devonshire

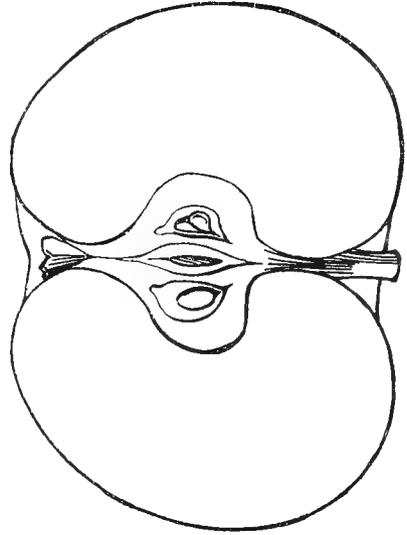
APPLES



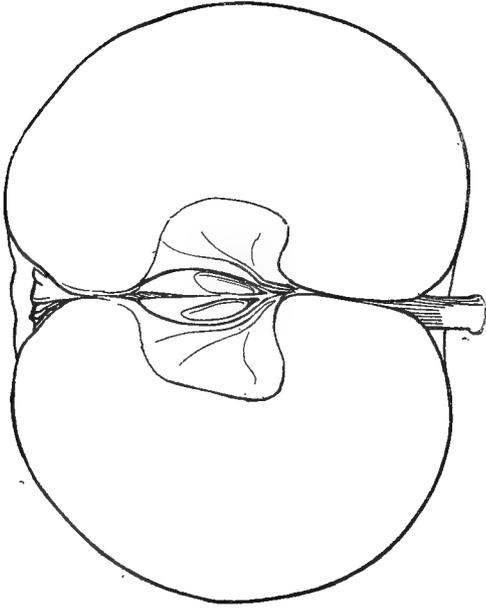
Ecklinville Seeding



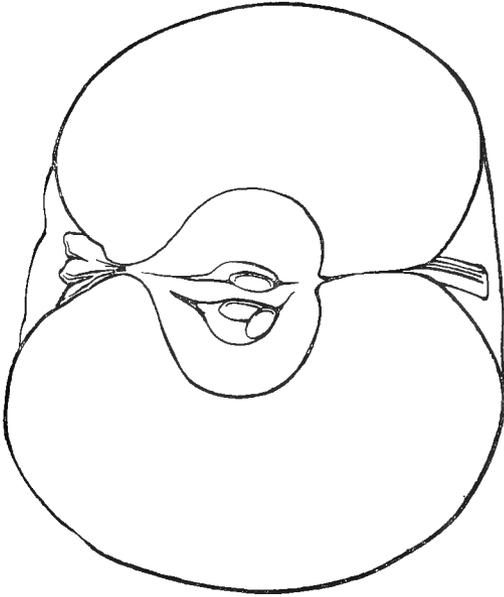
Emperor Alexander



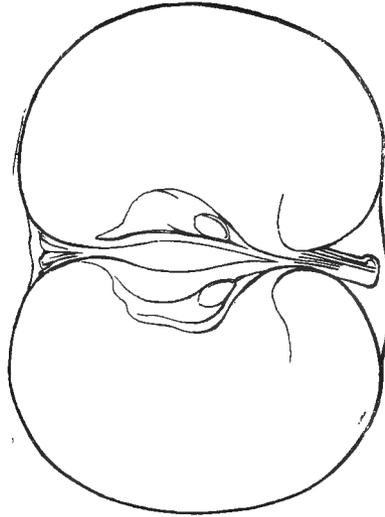
Egremont Russet



Golden Noble

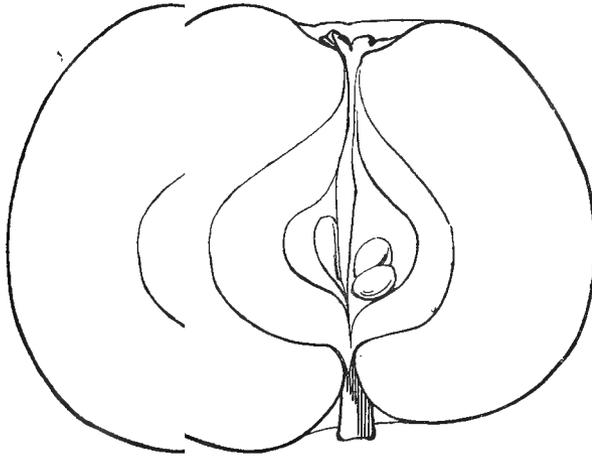


Gascoigne's Scarlet Seedling

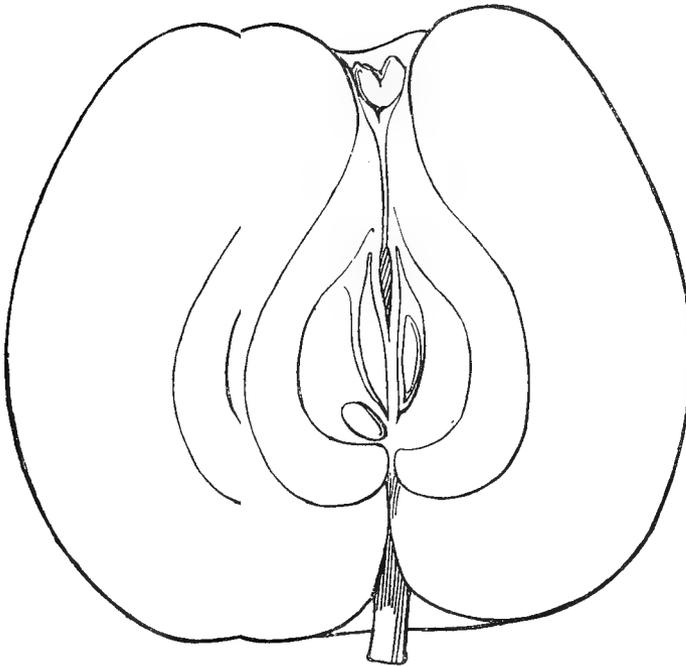


Fearn's Pippin

APPLES

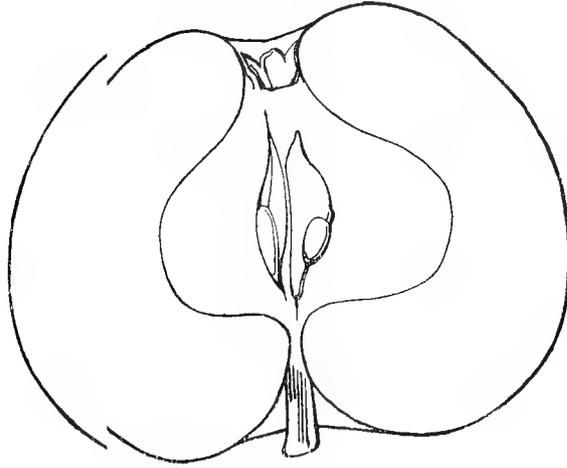


Golden Reinette

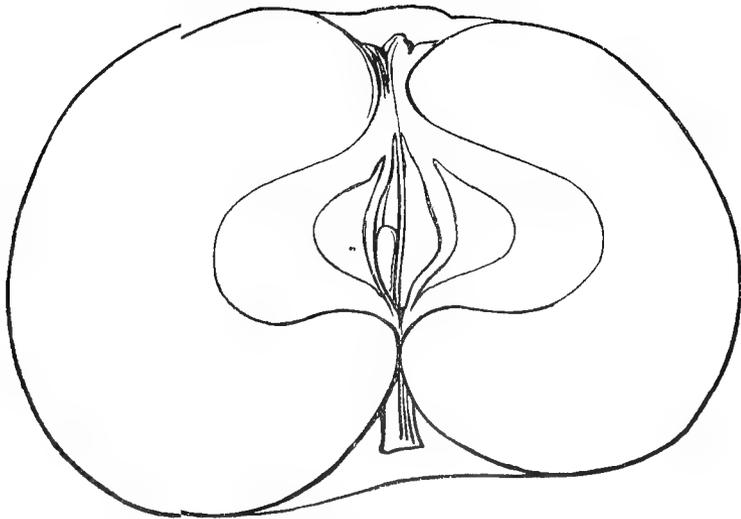


Golden Spire

APPLES

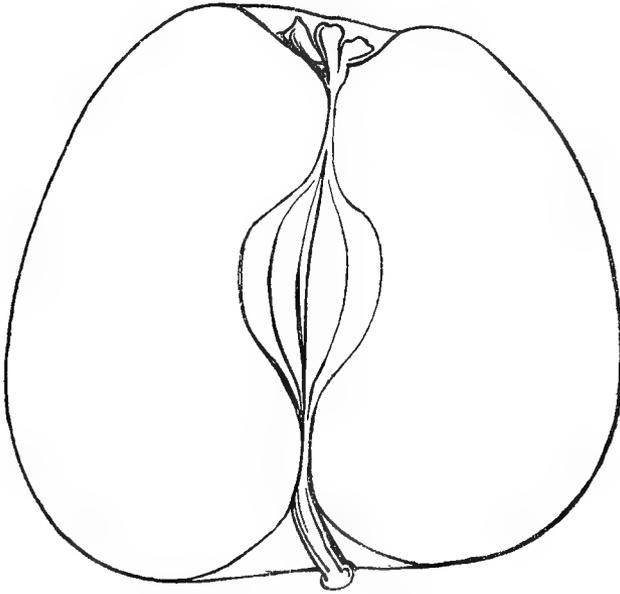


Gravenstein

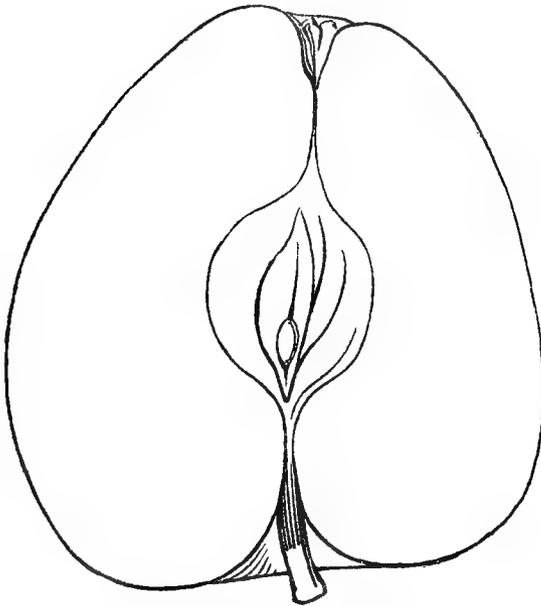


Grenadier Codlin

APPLES

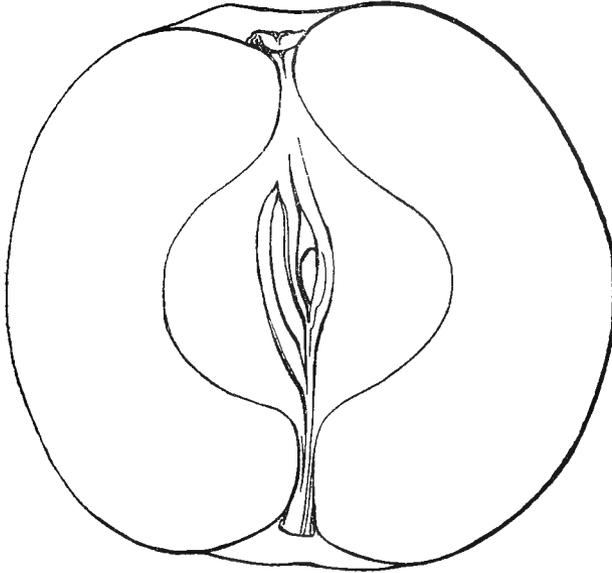


Hambling's Seedling

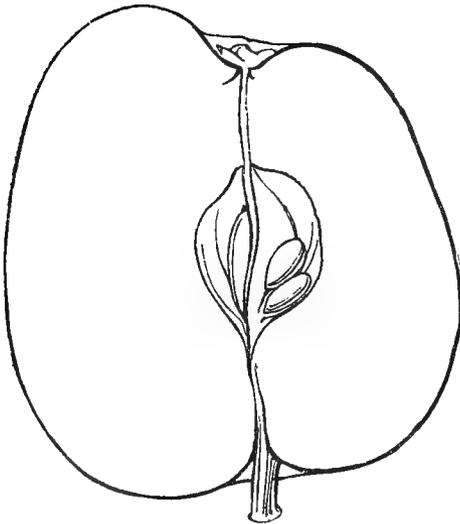


Hereford Crimson Queening

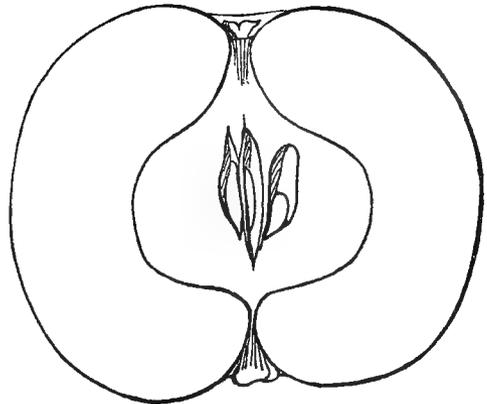
APPLES



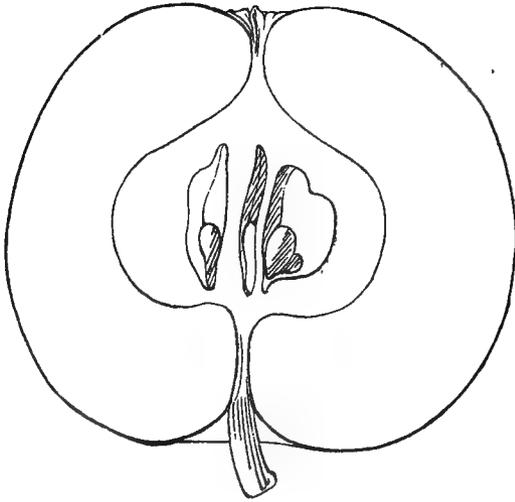
Hornead Pearmain



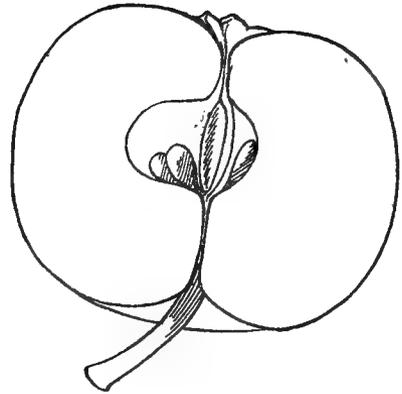
Hubbard's Pearmain



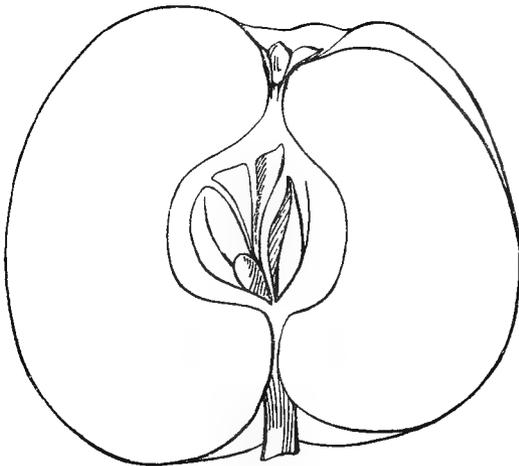
Irish Peach



James Grieve



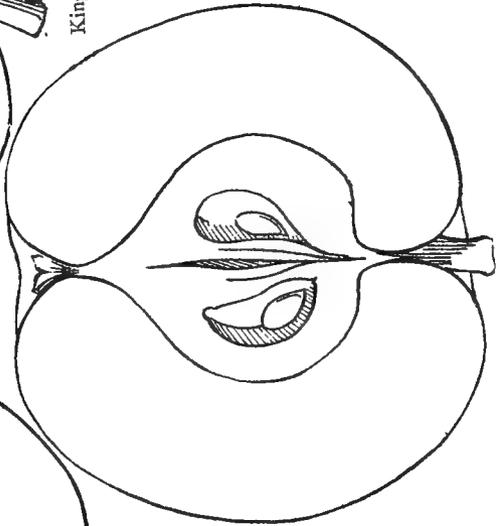
Kerry Pippin



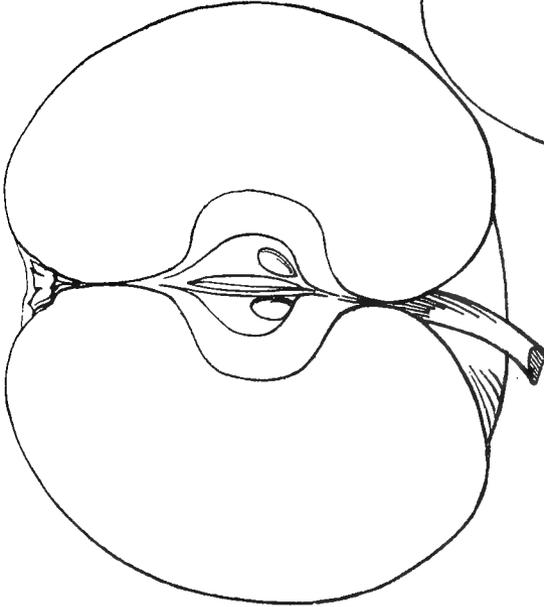
Keswick Codlin



King's Acre Pippin

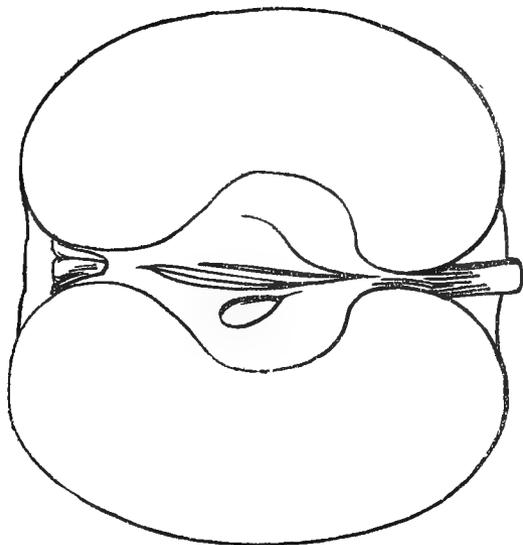


King of the Pippins

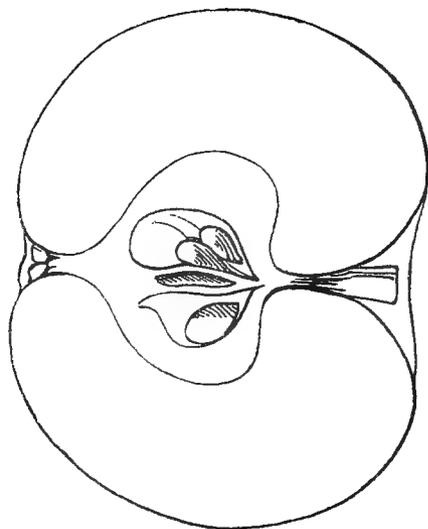


King of Tompkins County

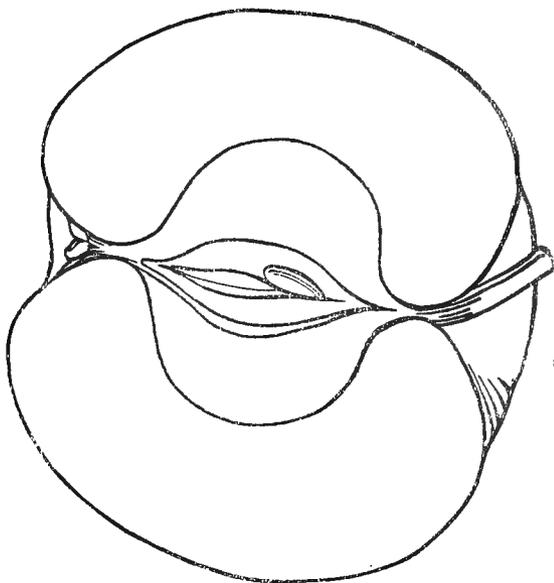
APPLES



Lady Henniker

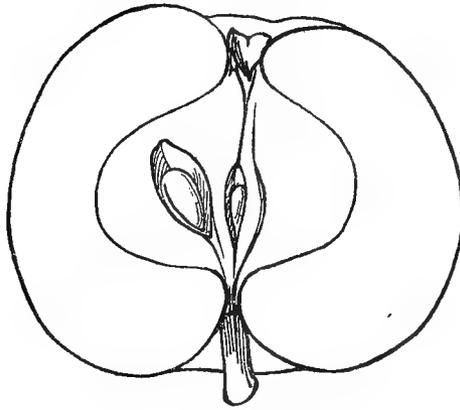


Lady Sudeley

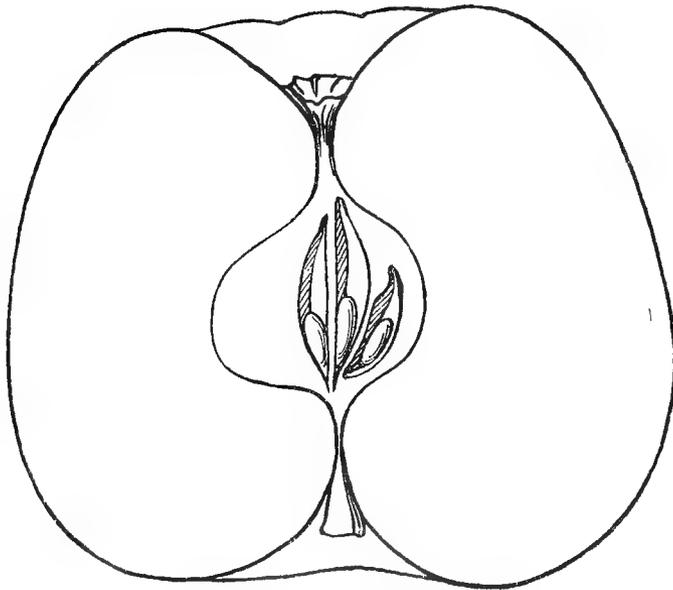


Lane's Prince Albert

APPLES

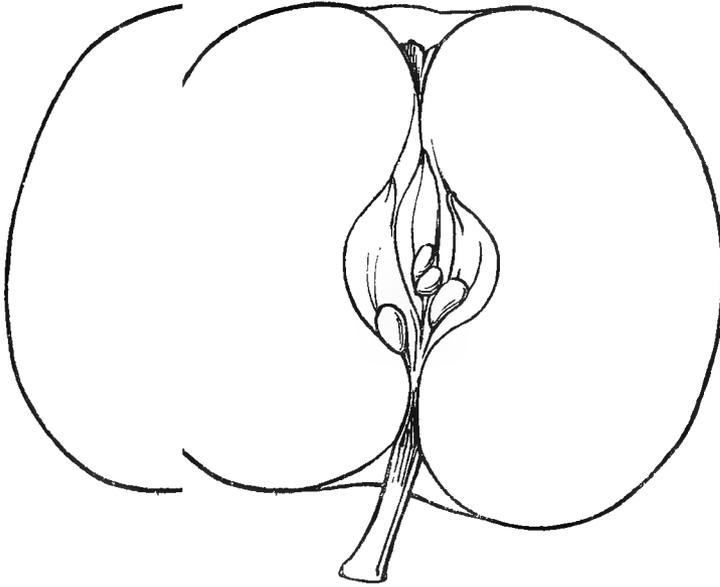


Lord Burghley



Lord Derby

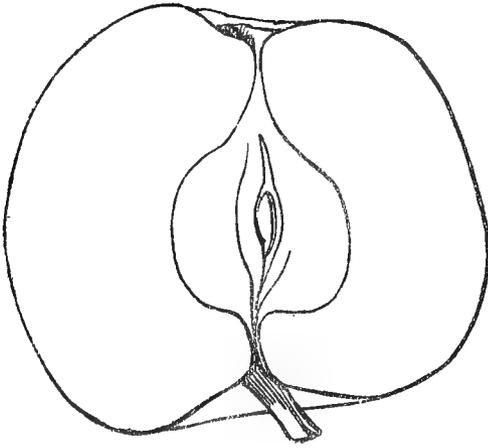
APPLES



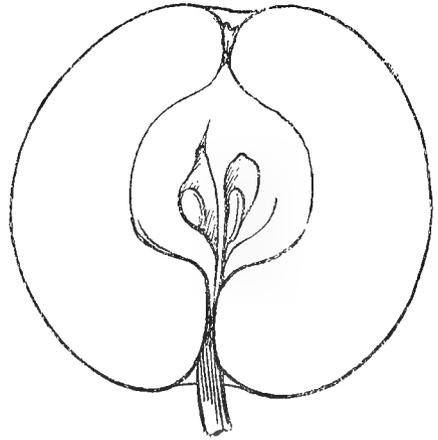
Lord Grosvenor



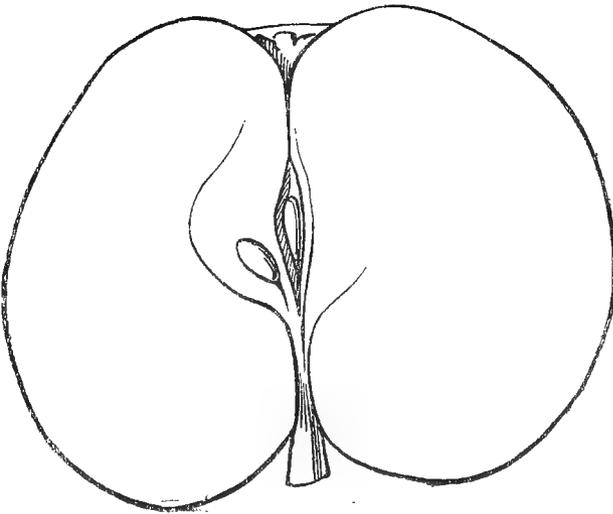
Lord Suffield



Mannington's Pearmain

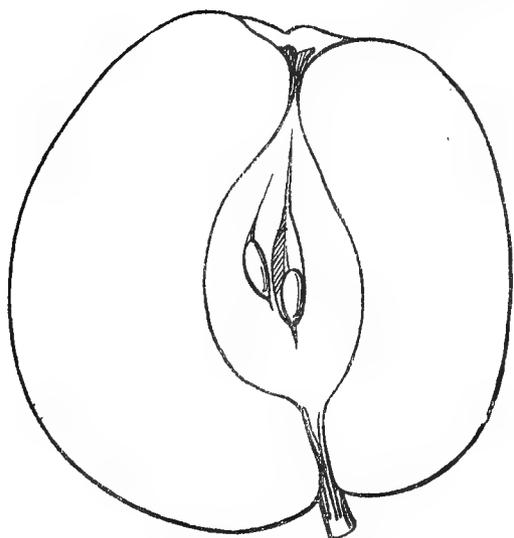


Margil

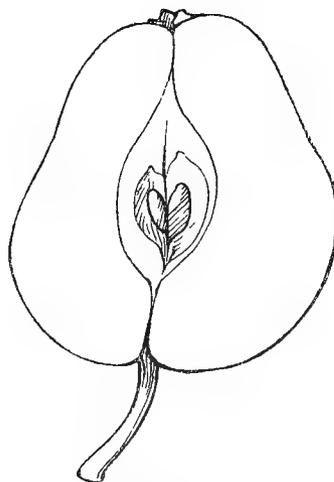


Mère de Ménage

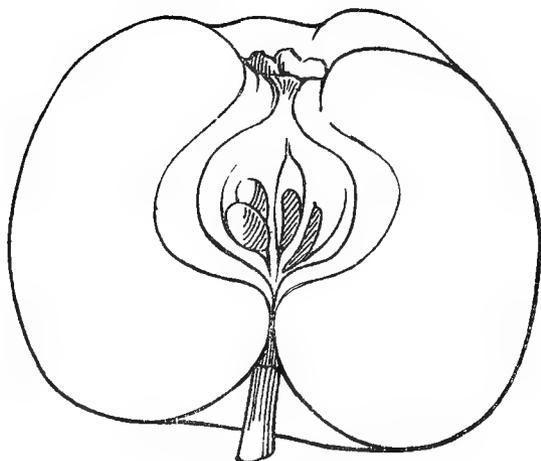
APPLES



Mother Apple

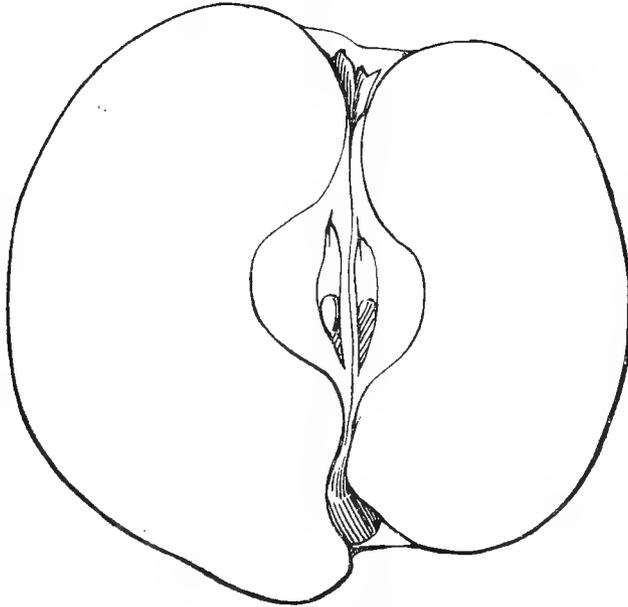


Mr. Gladstone

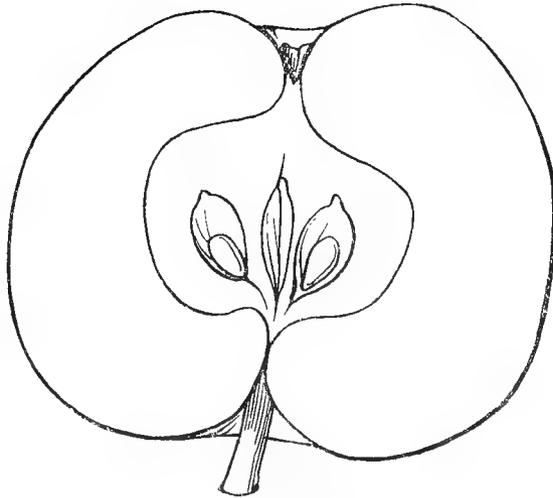


Mrs. Phillimore

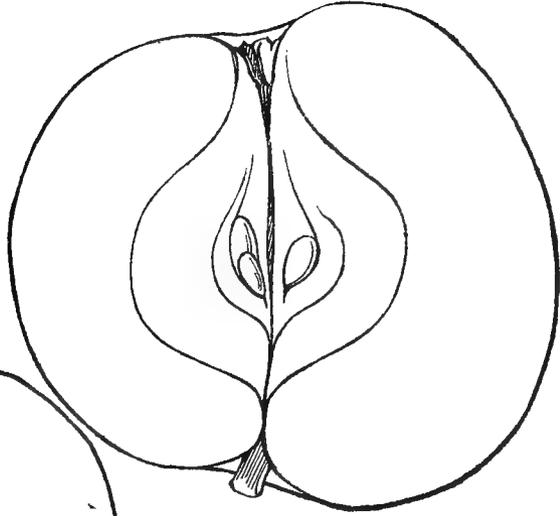
APPLES



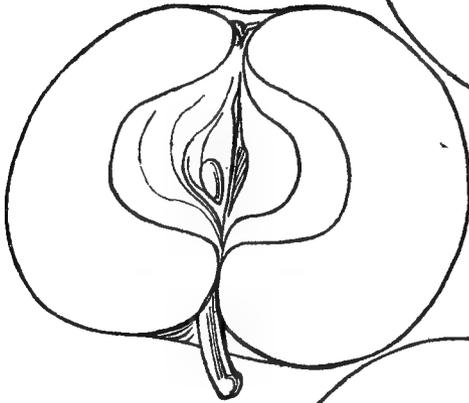
Newton Wonder



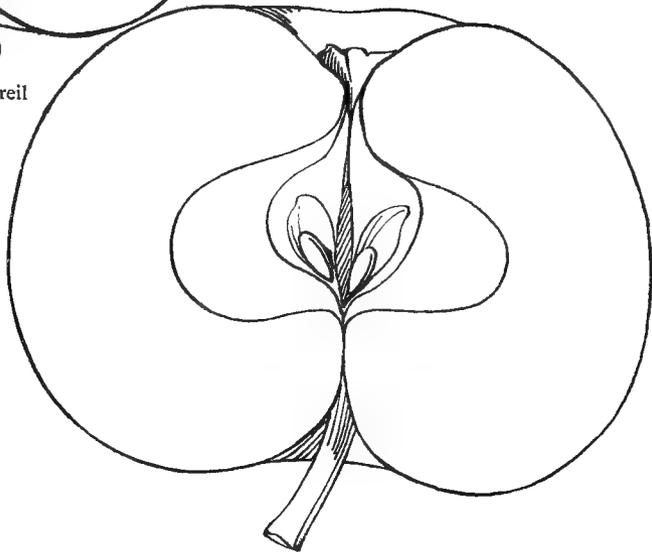
Norman's Pippin



Northern Greening

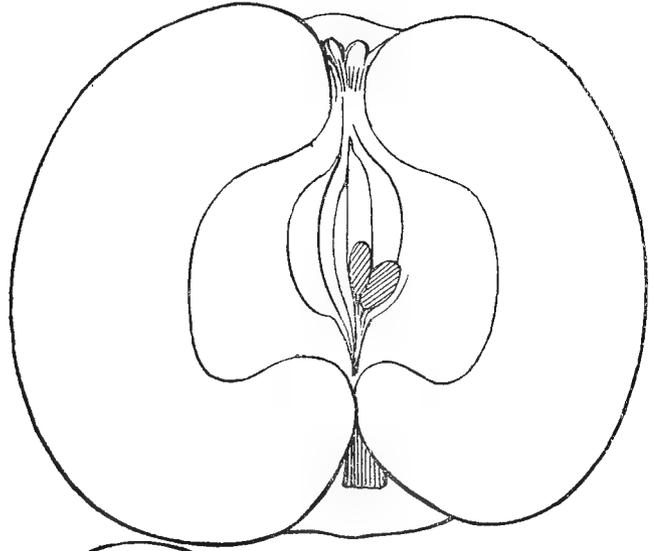


Old Winter Nonpareil

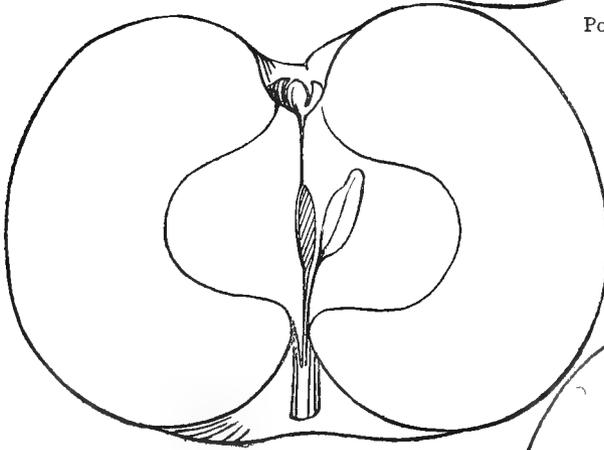


Peasgood's Nonesuch

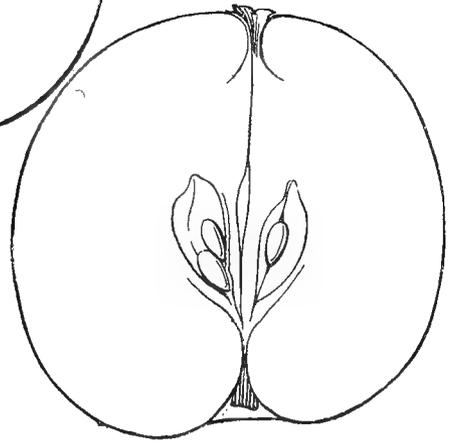
APPLES



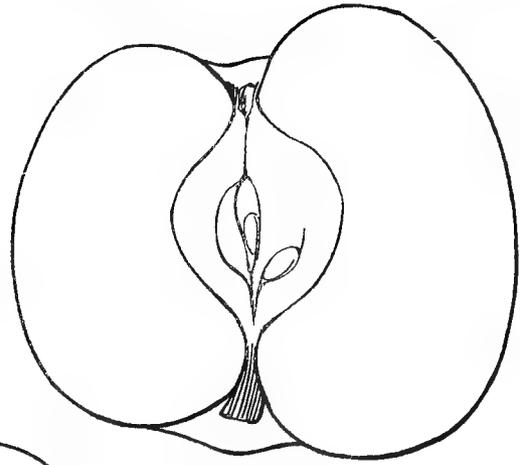
Pott's Seedling



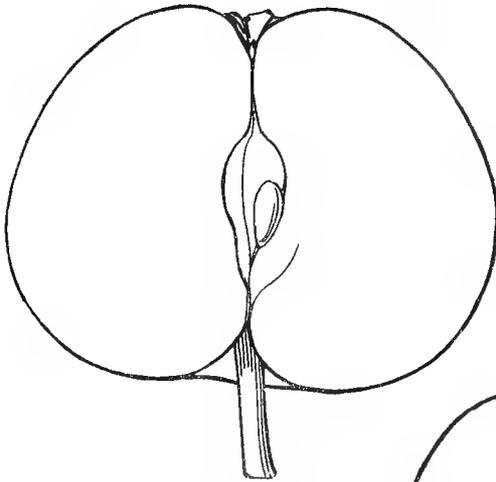
Reinette du Canada



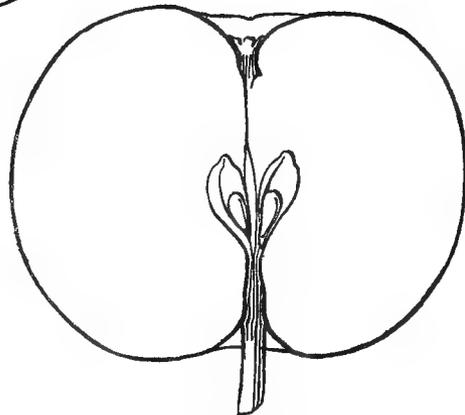
Red Juneating



Ribston Pippin

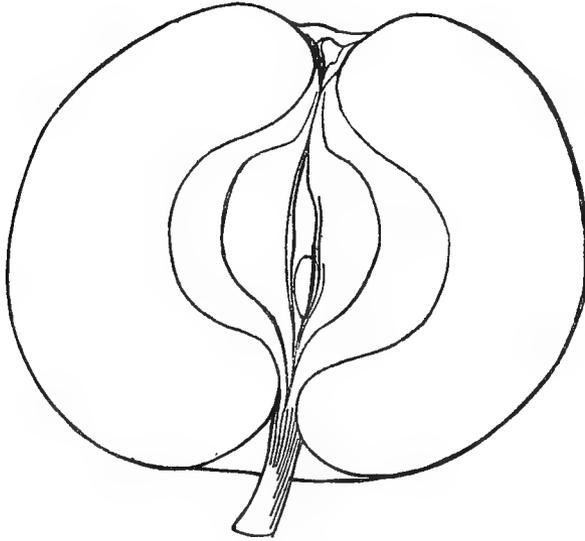


Rosemary Russet

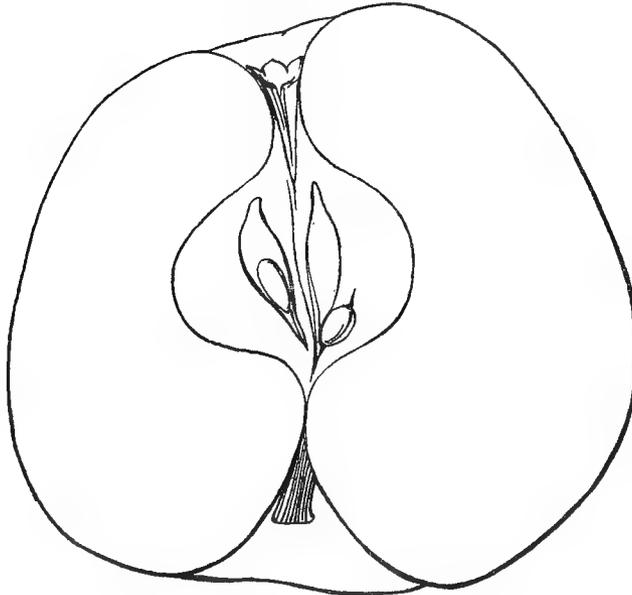


Ross Nonpareil

APPLES



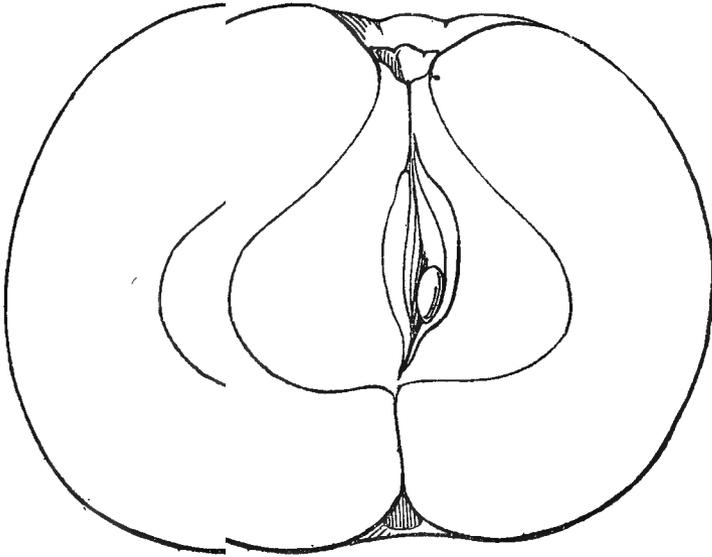
Roundway Magnum Bonum



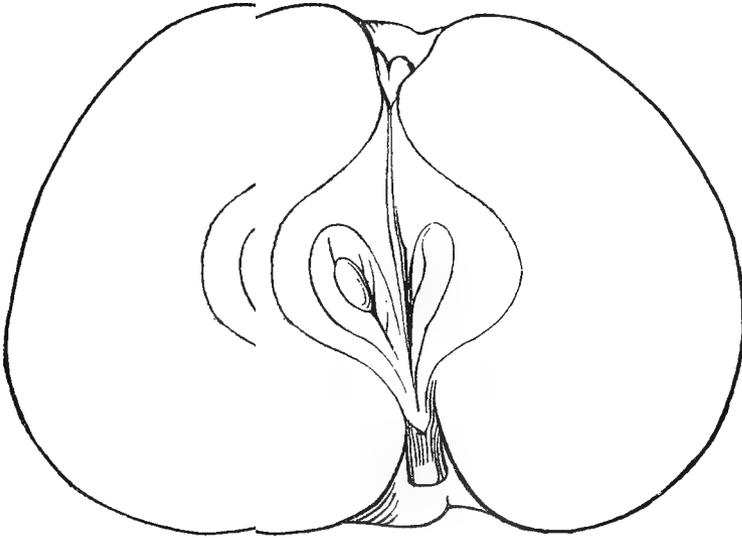
Graham's Royal Jubilee

APPLES

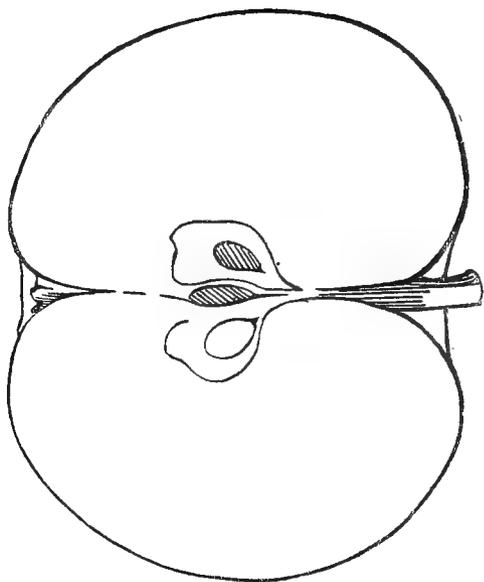
427



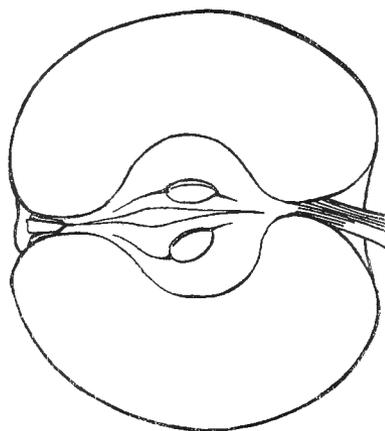
Royal Late Cooking



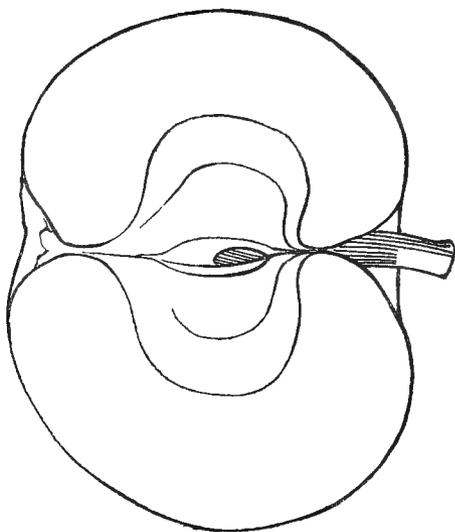
Sandringham



Sanspareil

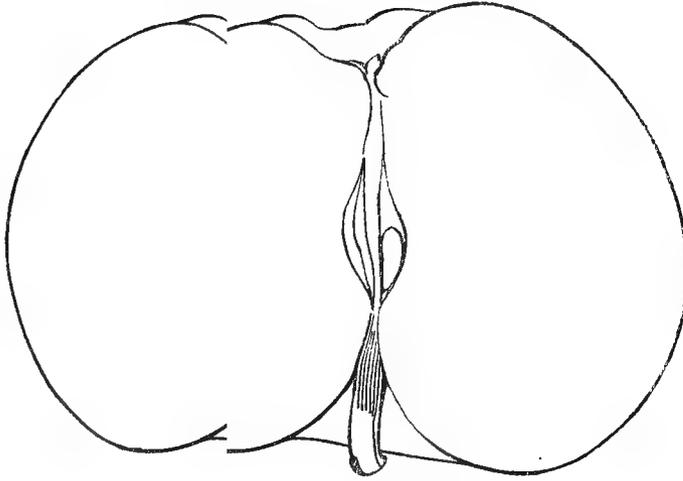


St. Edmund's Pippin

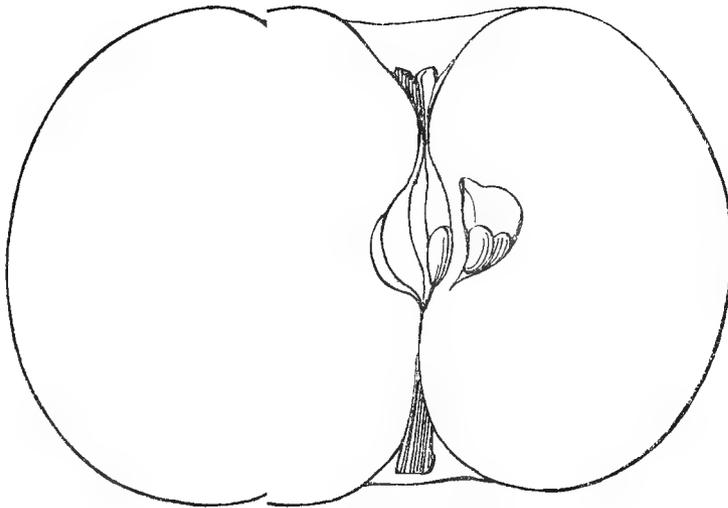


Scarlet Nonpareil

APPLES

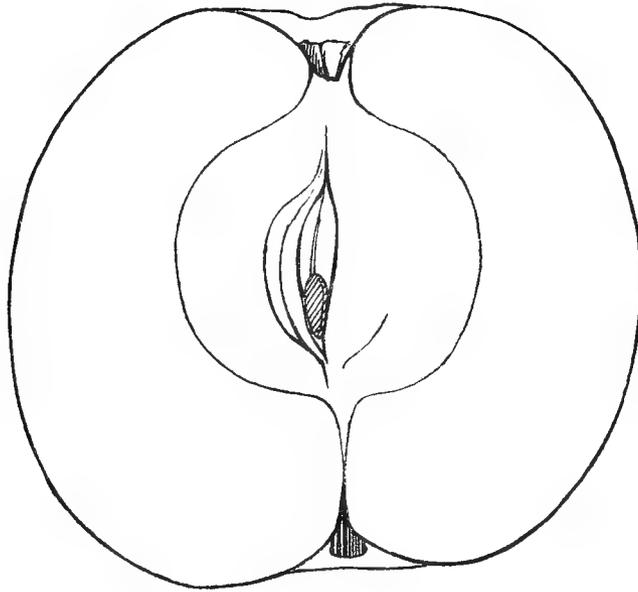


Seaton House

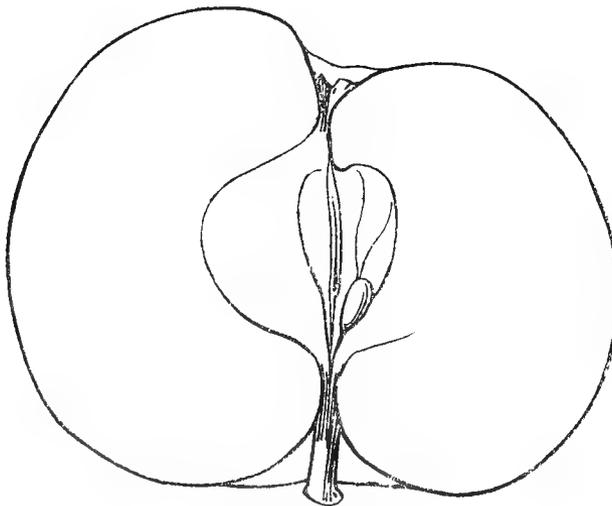


Stirling Castle

APPLES

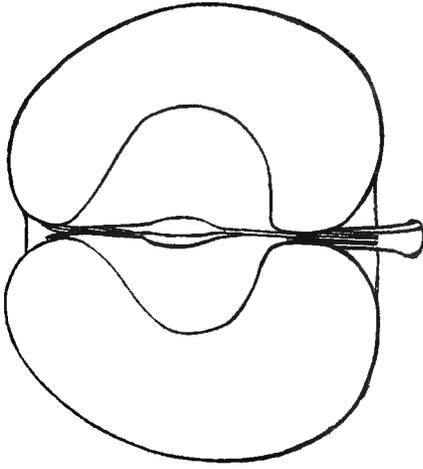


Stone's Apple

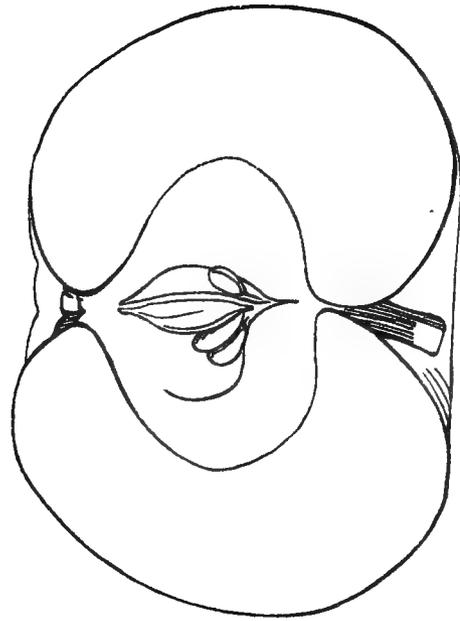


Striped Beaufin

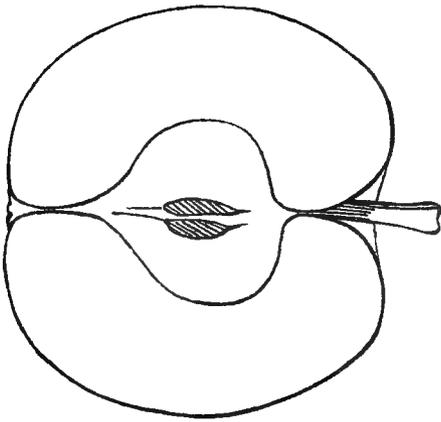
APPLES



Sturmer Pippin

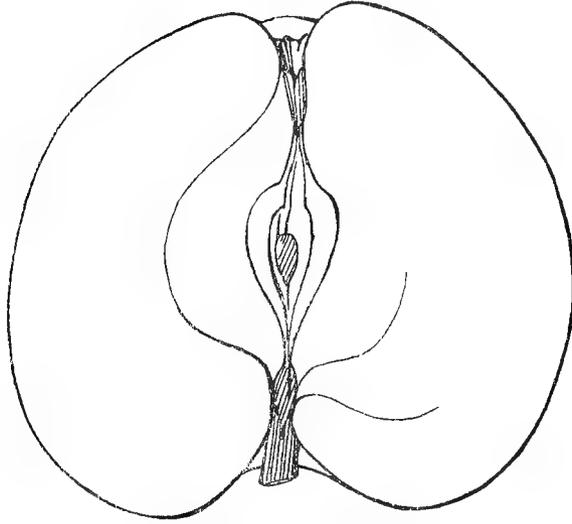


The Queen

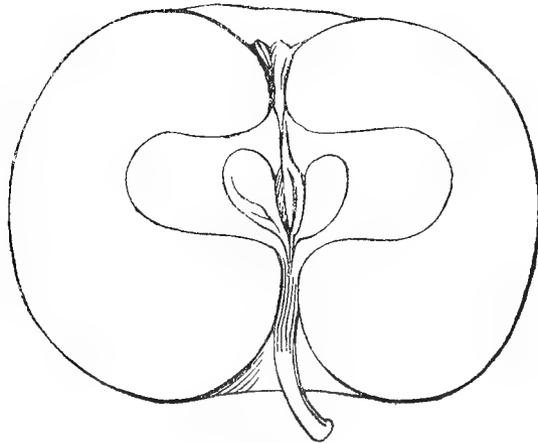


Summer Golden Pippin

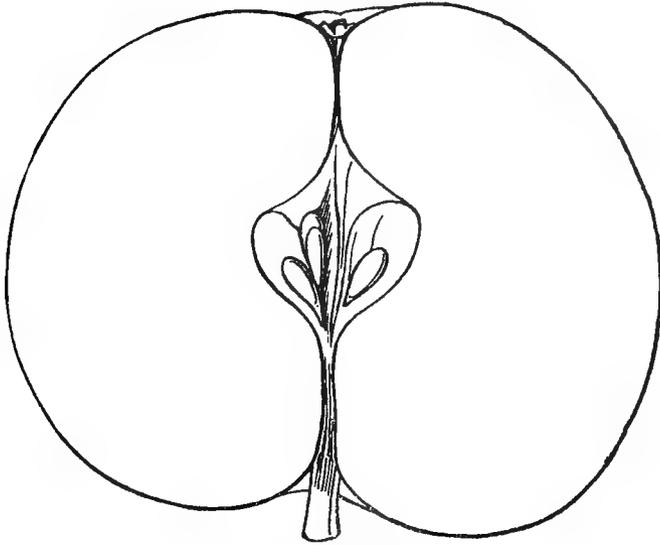
APPLES



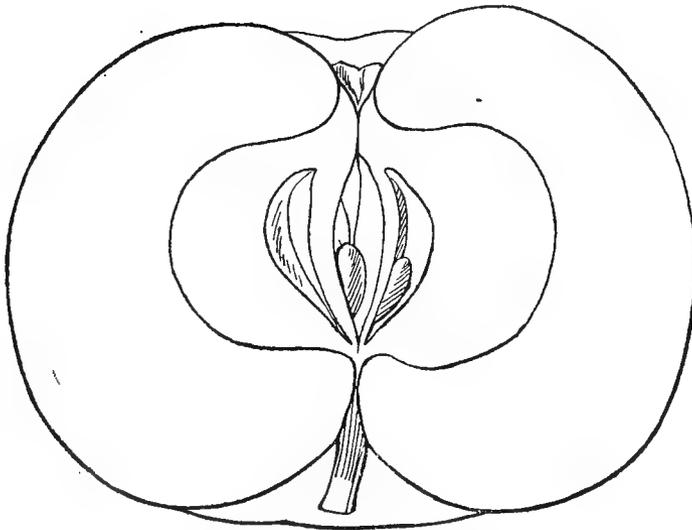
Tower of Glamis



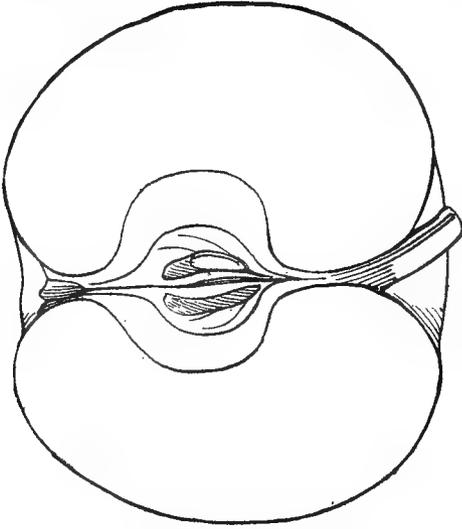
Wagener



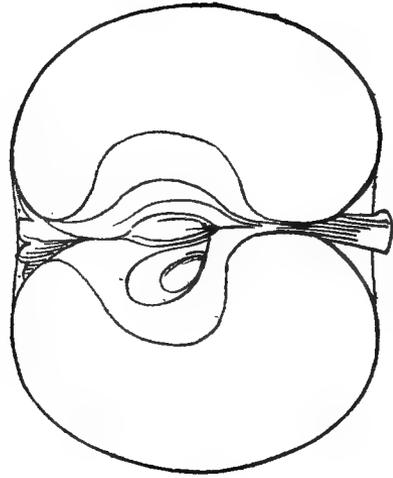
Waltham Abbey Seedling



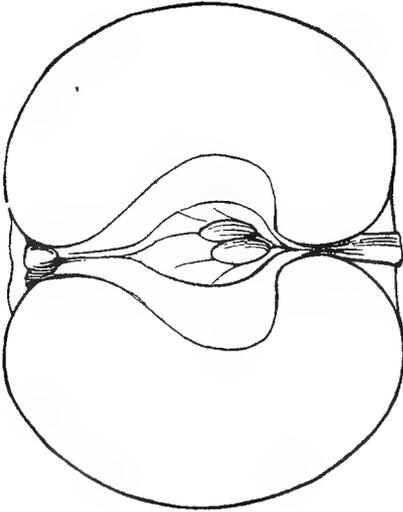
Warner's King



Wealthy

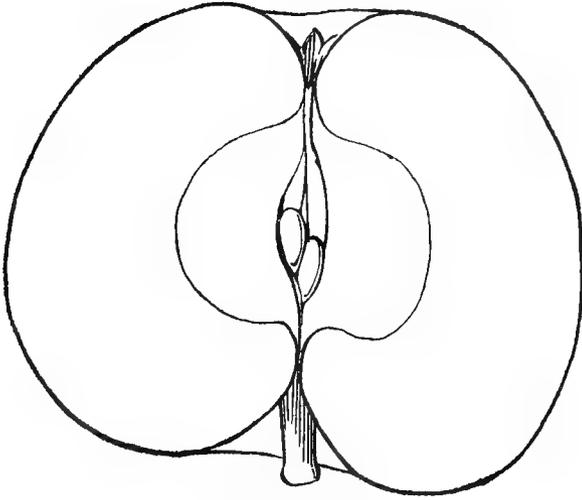


White Nonpareil

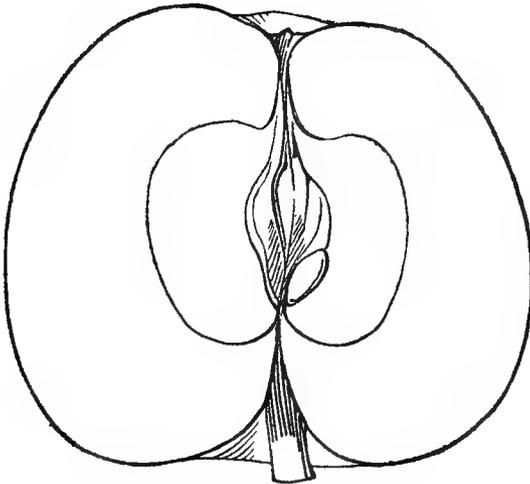


Wellington

APPLES

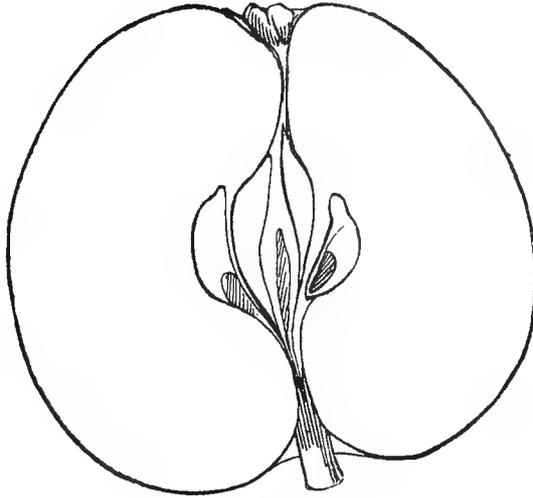


White Transparent



Winter Queening

APPLES

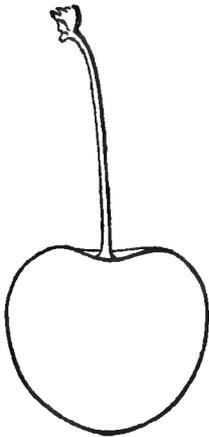


Worcester Pearmain

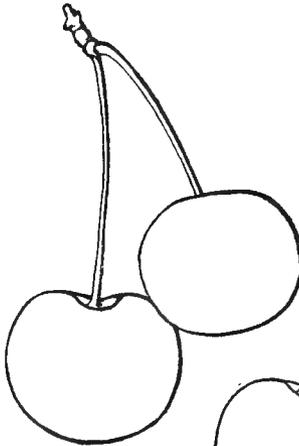


The Barberry

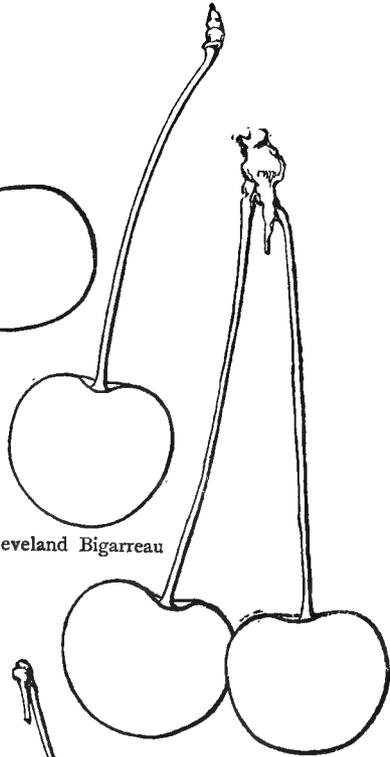
CHERRIES



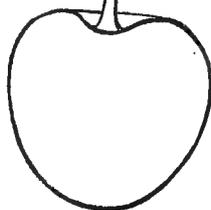
Bigarreau de Mezel



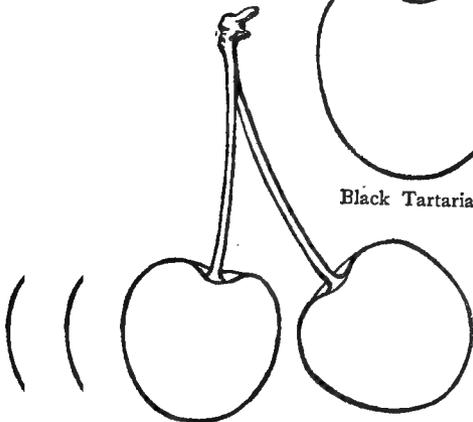
Belle d'Orléans



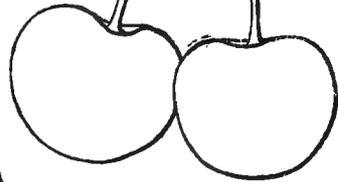
Cleveland Bigarreau



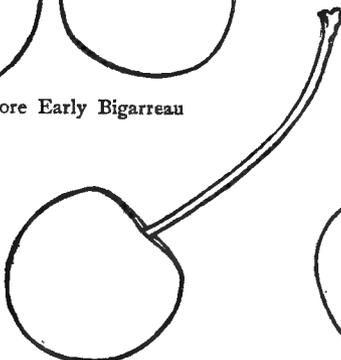
Black Tartarian



Frogmore Early Bigarreau



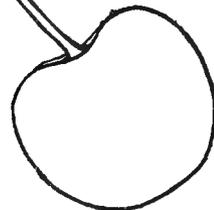
Black Eagle



Florence Heart— $\frac{1}{2}$ size

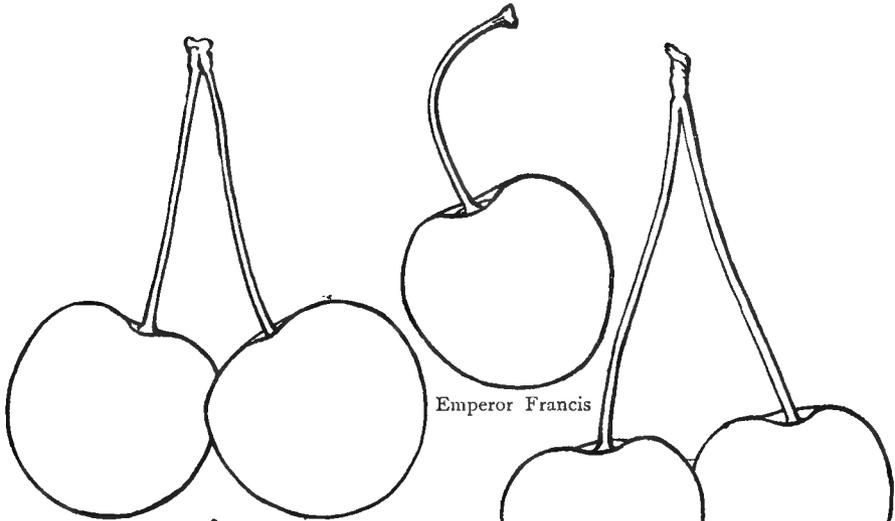


Elton Heart



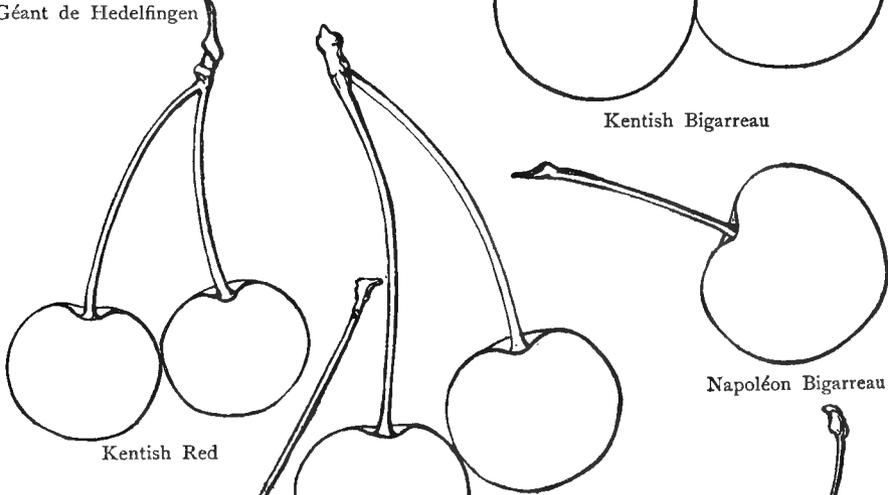
Early Rivers

CHERRIES



Géant de Hedelfingen

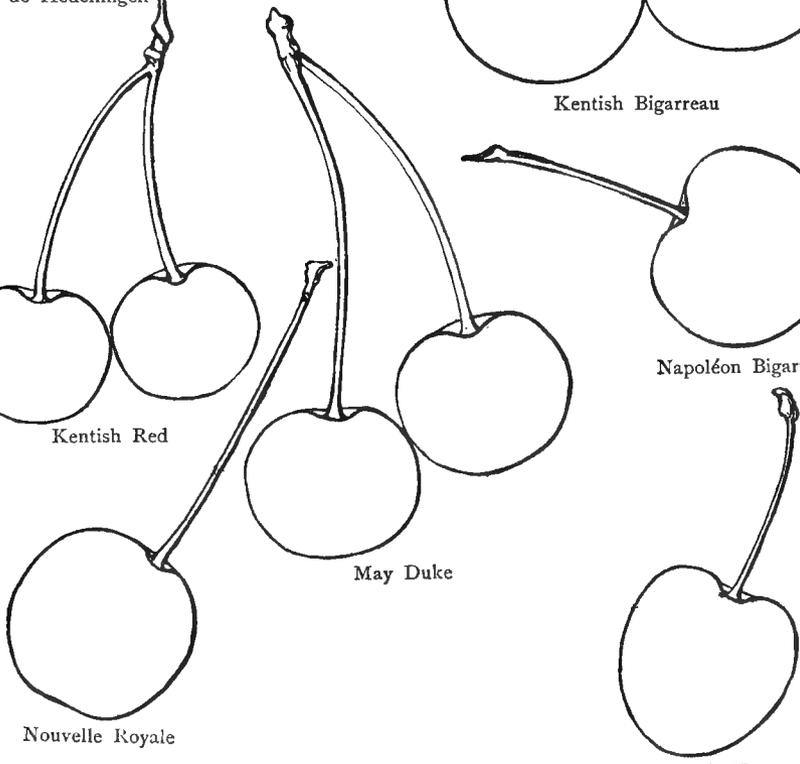
Emperor Francis



Kentish Red

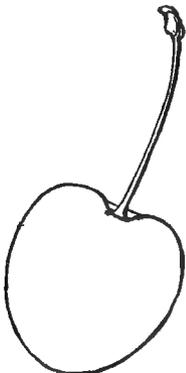
Kentish Bigarreau

Napoléon Bigarreau



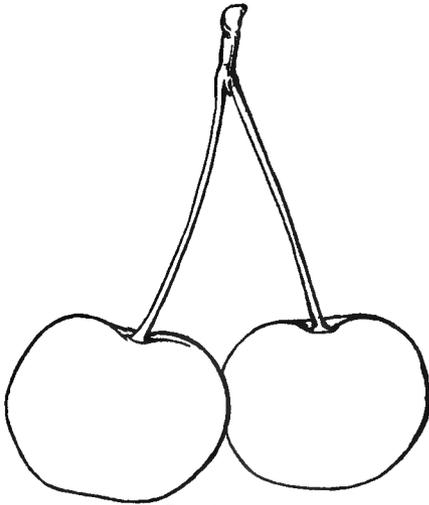
May Duke

Nouvelle Royale



Old Black Heart

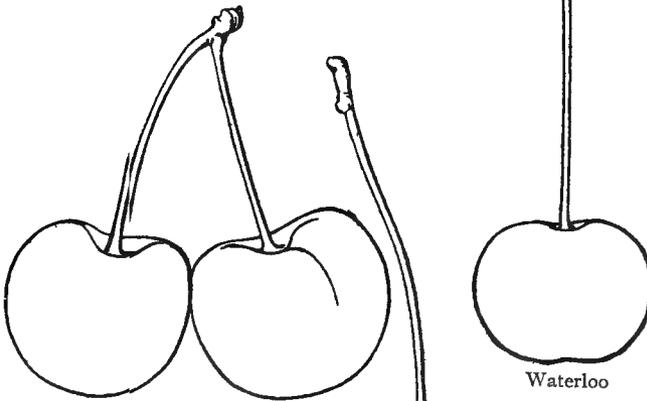
CHERRIES



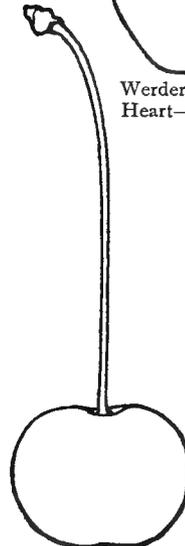
Royal Duke



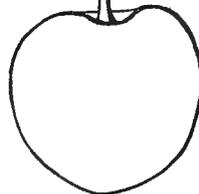
Werder's Black Heart— $\frac{1}{2}$ size



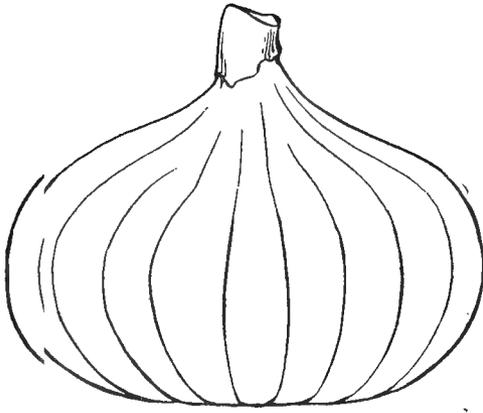
The Noble



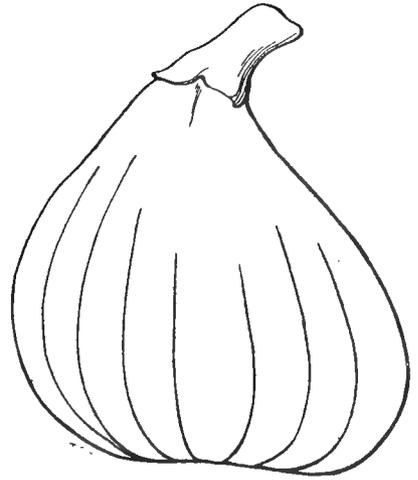
Waterloo



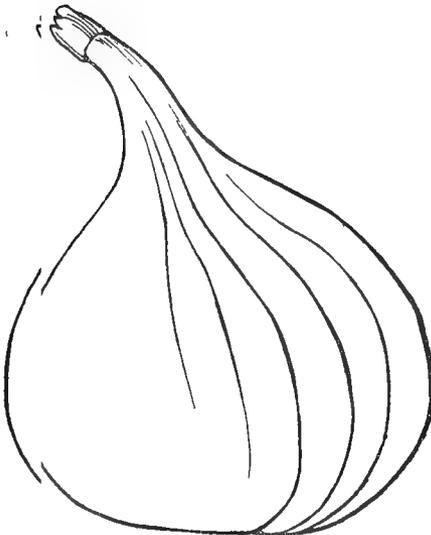
St. Margaret's



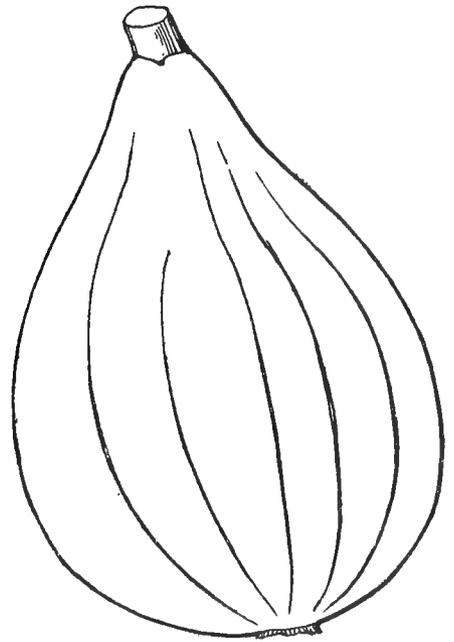
Bourjasotte Grise



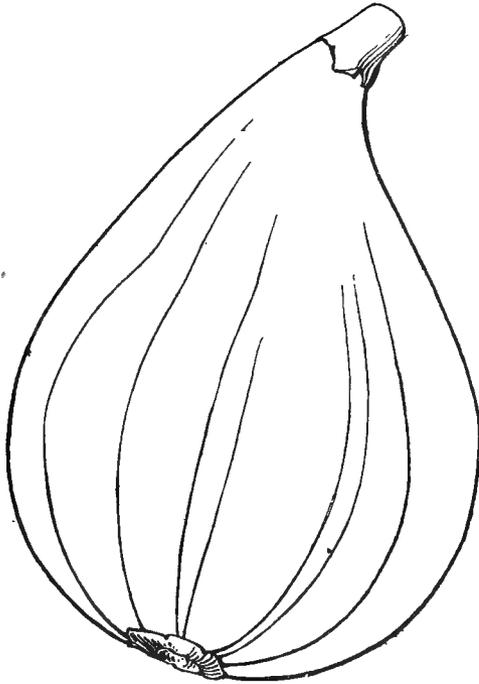
Malta



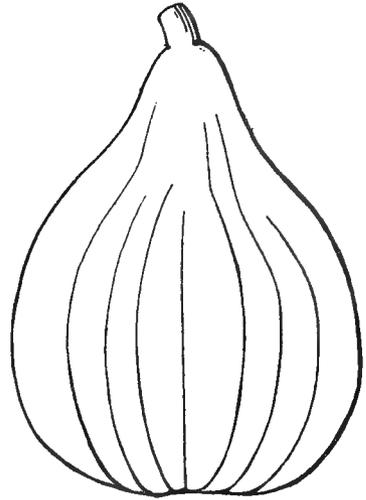
Osborn's Prolific



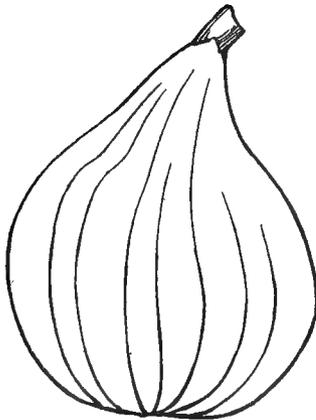
Negro Largo



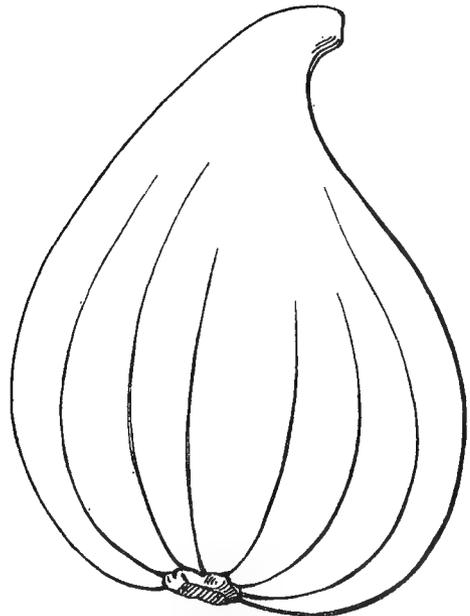
St. John's



Violette Sepor

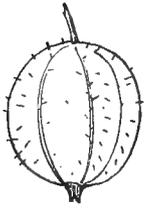


White Ischia

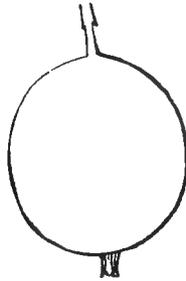


White Marseilles

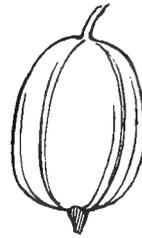
SMALL-FRUITED GOOSEBERRIES



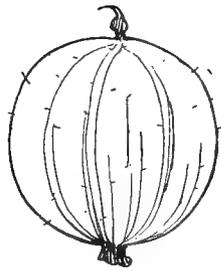
Green Hedgehog



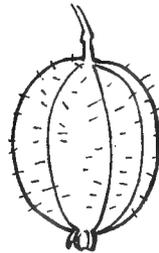
Cheshire Lass (white)



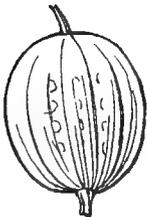
Red Champagne



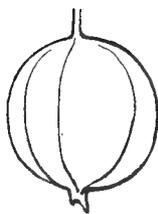
Warrington (red)



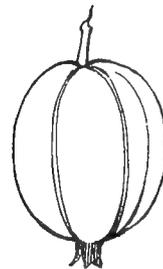
Yellow Champagne



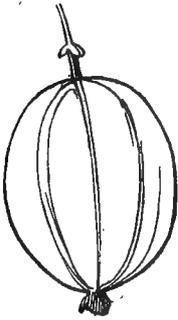
Bright Venus (white, $\frac{1}{2}$ size)



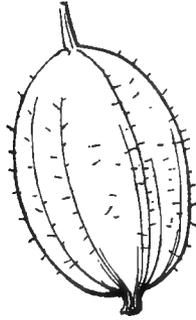
Yellow Ball



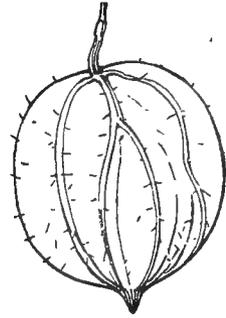
Crown Bob (red, $\frac{1}{2}$ size,
Large-fruited)



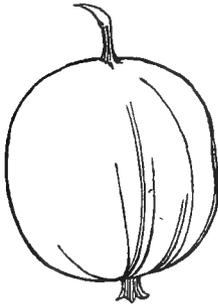
Beauty (red, $\frac{1}{2}$ size)



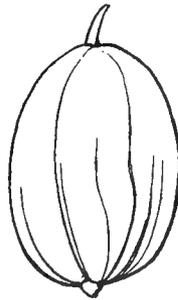
Bobby (red, $\frac{1}{2}$ size)



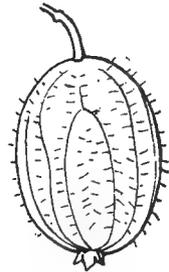
Dan's Mistake (red, $\frac{1}{2}$ size)



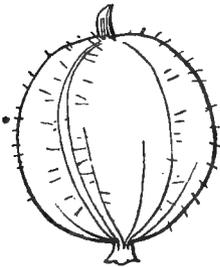
Lord Derby (red, $\frac{1}{2}$ size)



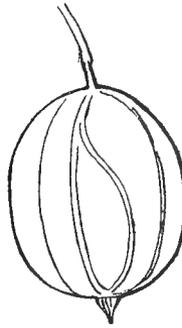
Napoleon the Great (red, $\frac{1}{2}$ size)



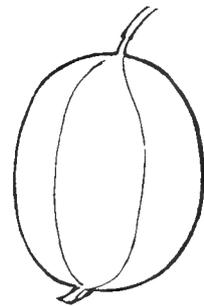
Lancashire Lad (red, $\frac{1}{2}$ size)



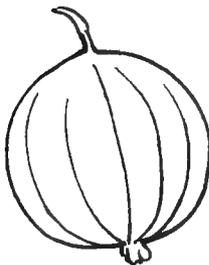
Rifleman (red, $\frac{1}{2}$ size)



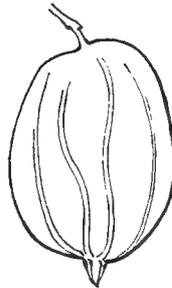
Smith's Nonpareil (white, $\frac{1}{2}$ size)



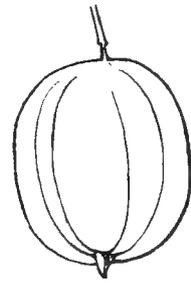
Careless (white, $\frac{1}{2}$ size)



Lady Leicester (white, $\frac{1}{2}$ size)

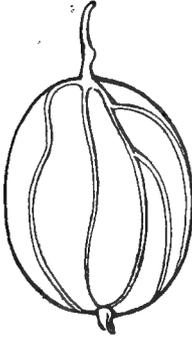


Lancer (white, $\frac{1}{2}$ size)

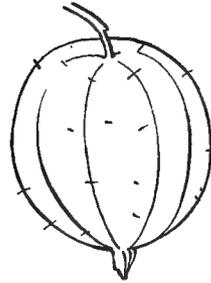


Alma (white, $\frac{1}{2}$ size)

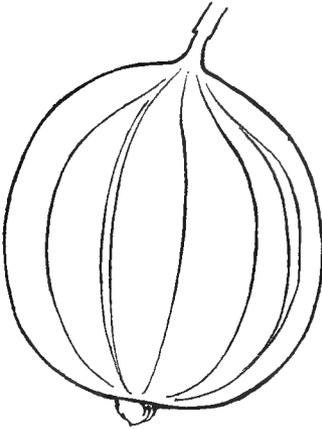
LARGE-FRUITED GOOSEBERRIES



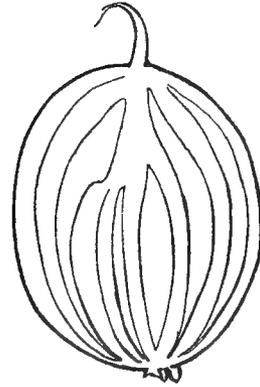
Criterion (yellow, $\frac{1}{2}$ size)



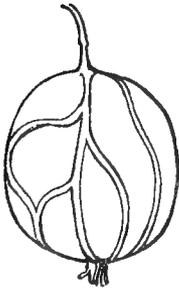
High Sheriff (yellow, $\frac{1}{2}$ size)



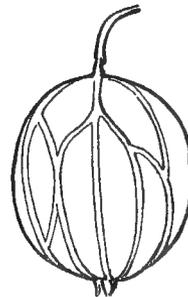
Telegraph (green)



Langley Beauty (yellow)

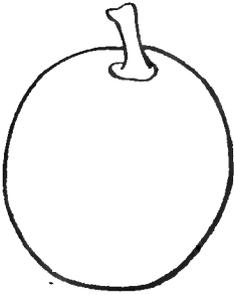


Leader (yellow, $\frac{1}{2}$ size)

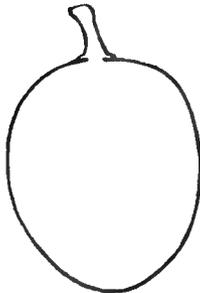


Leveller (yellow, $\frac{1}{2}$ size)

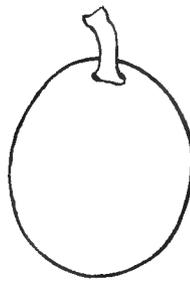
GRAPES



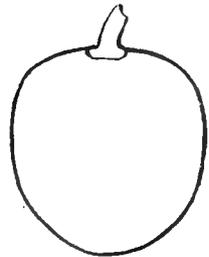
Alicante



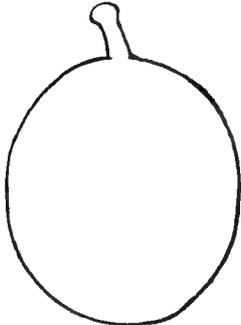
Appley Towers



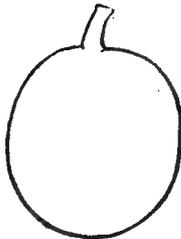
Black Hamburg



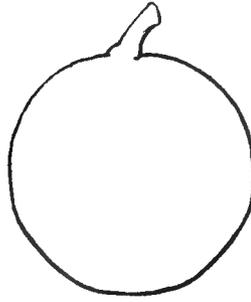
Buckland Sweetwater



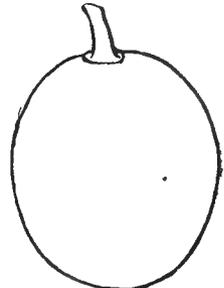
Duke of Buccleuch



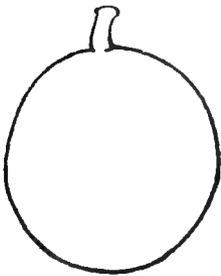
Foster's Seedling



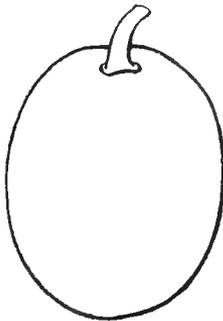
Gros Colmar



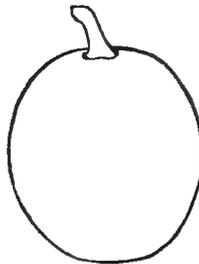
Gros Maroc



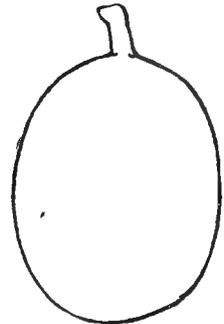
Lady Downe's Seedling



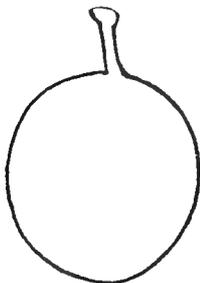
Madresfield Court



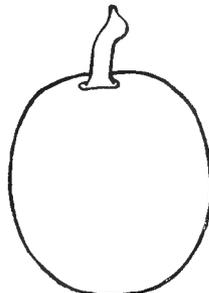
Mrs. Pince



Muscat of Alexandria

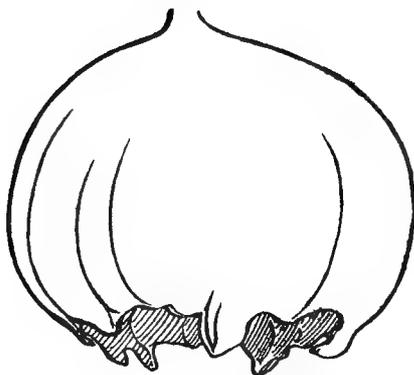


Muscat Hamburg

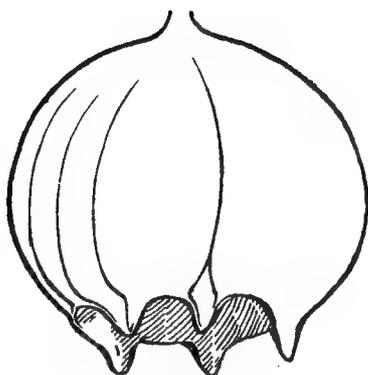


White Tokay

MEDLARS

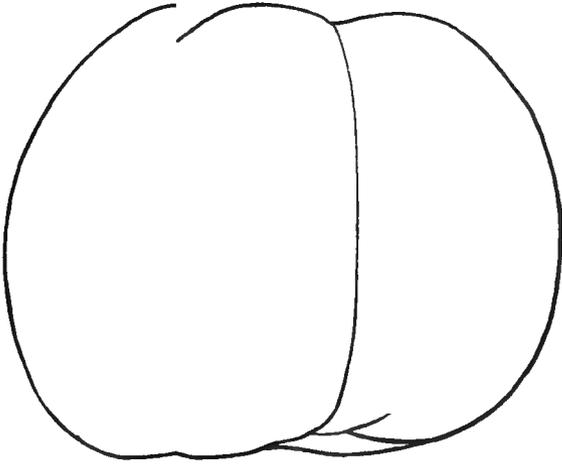


Dutch Medlar

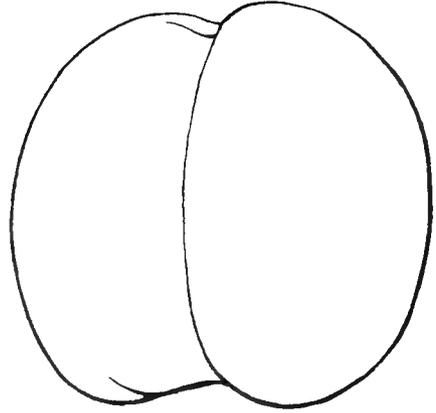


Royal Medlar

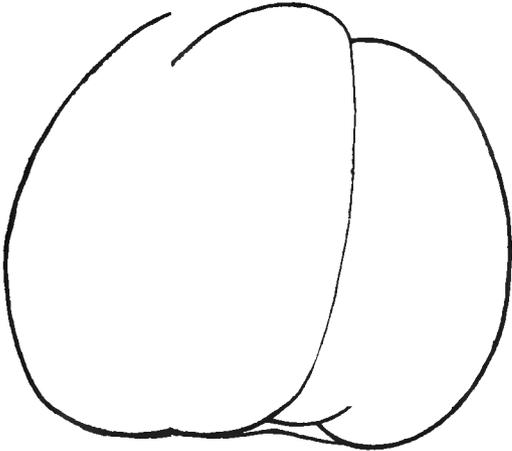
NECTARINES



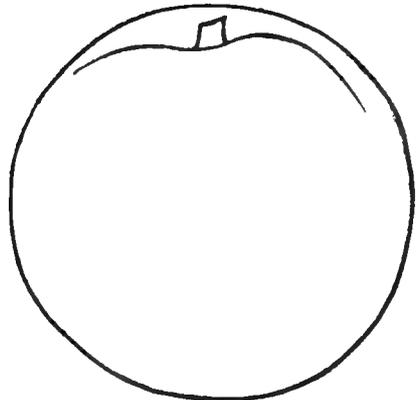
Cardinal



Early Rivers

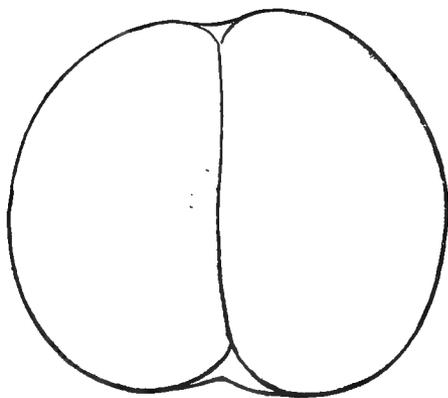


Humboldt

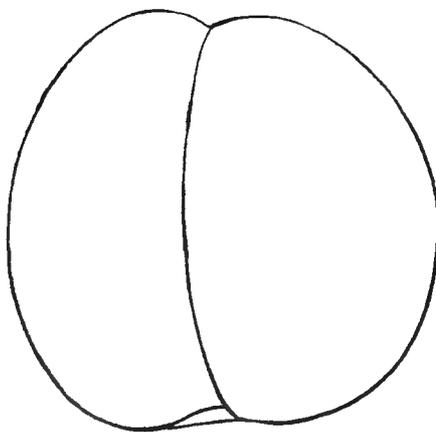


Lord Napier

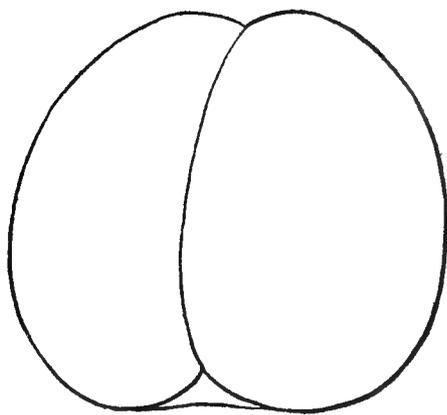
NECTARINES



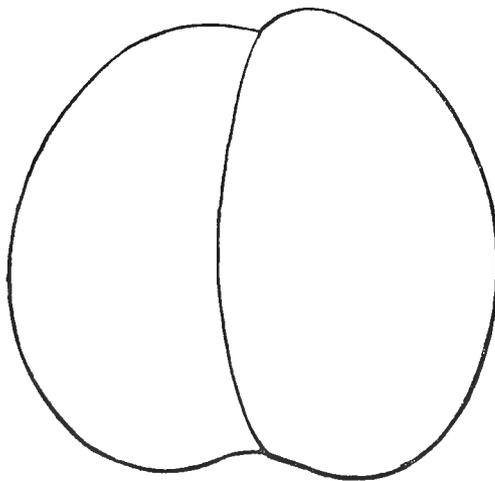
Newton



Pineapple

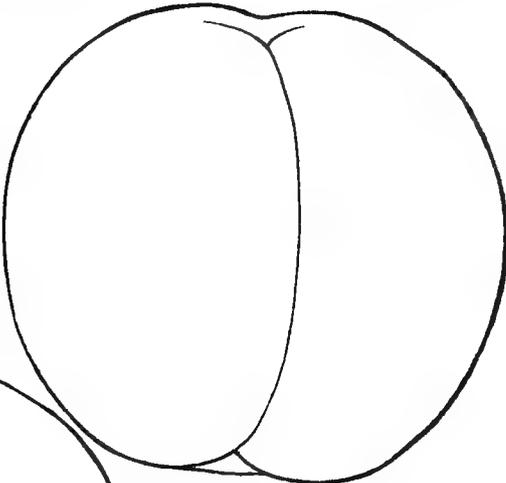


Rivers' Orange

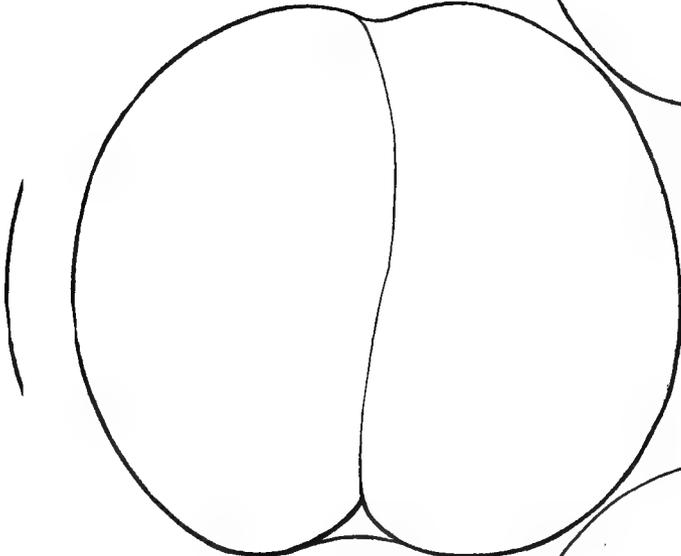


Victoria

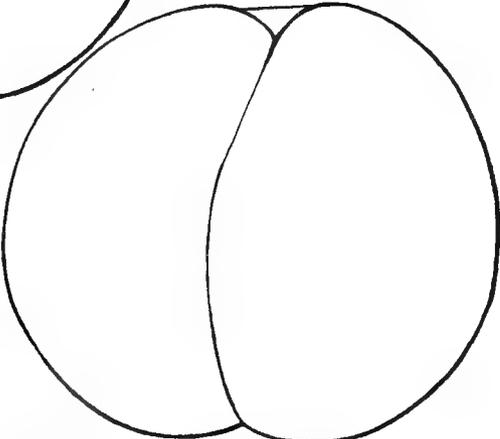
PEACHES



Alexandra Noblesse

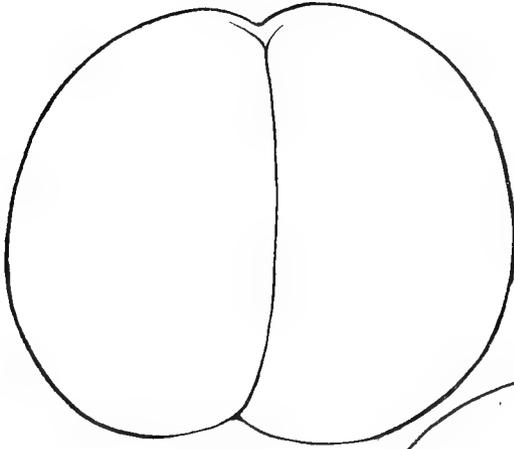


Barrington

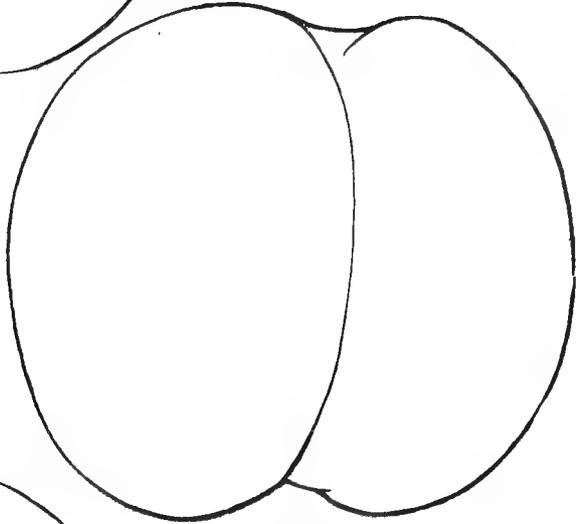


Bellegarde

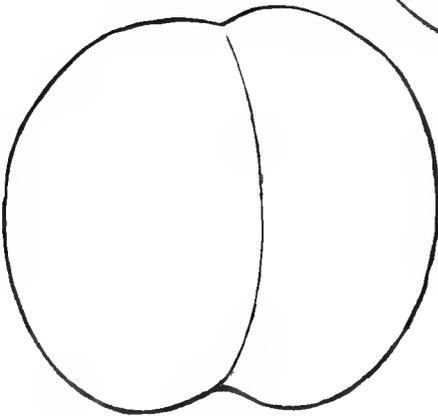
PEACHES



Condor

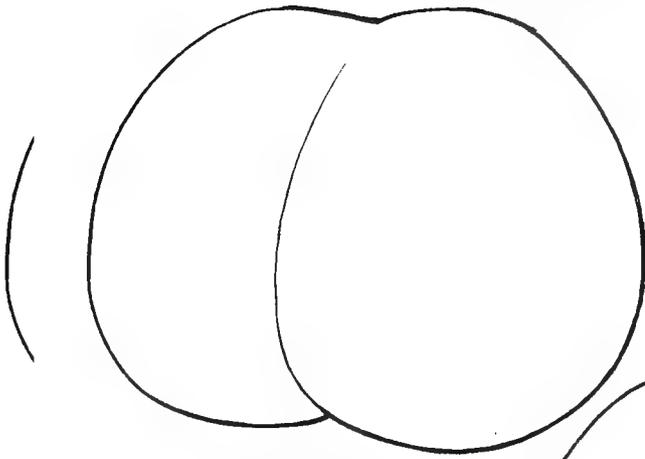


Crimson Galande

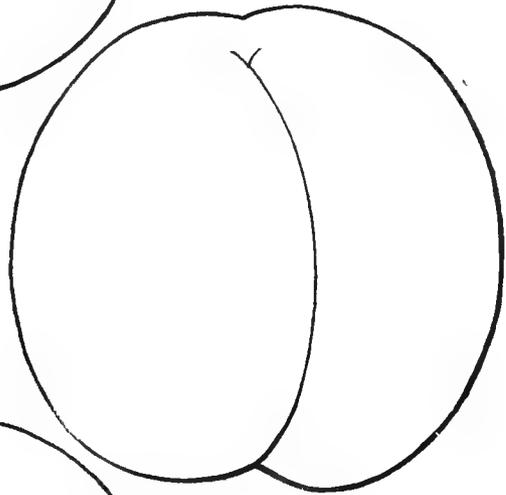


Early Alfred

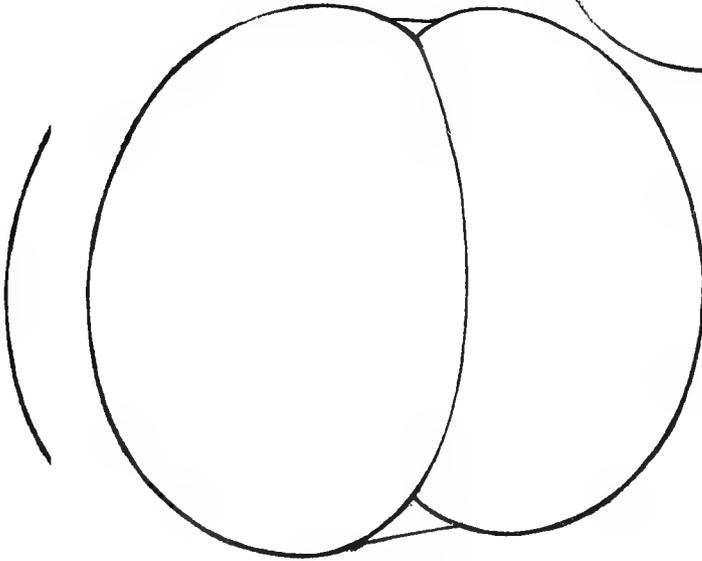
PEACHES



Grosse Mignonne

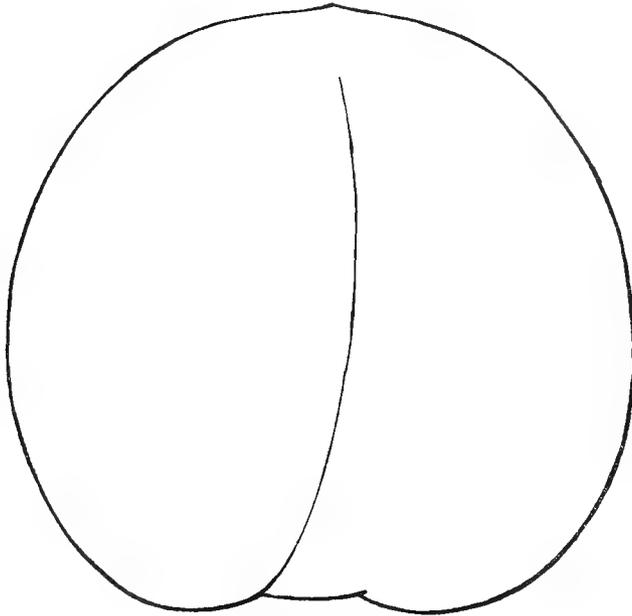


Hale's Early

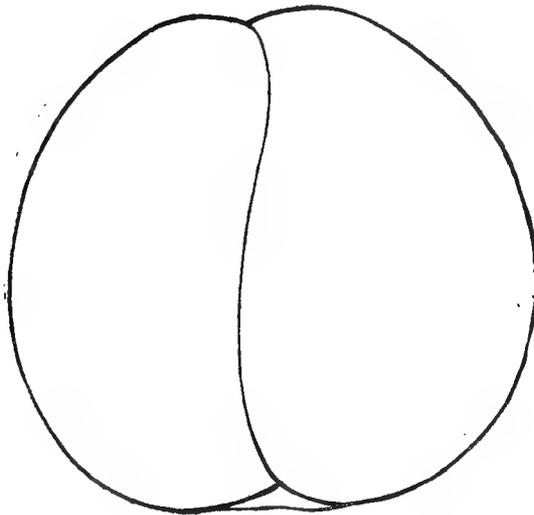


Late Devonian

PEACHES

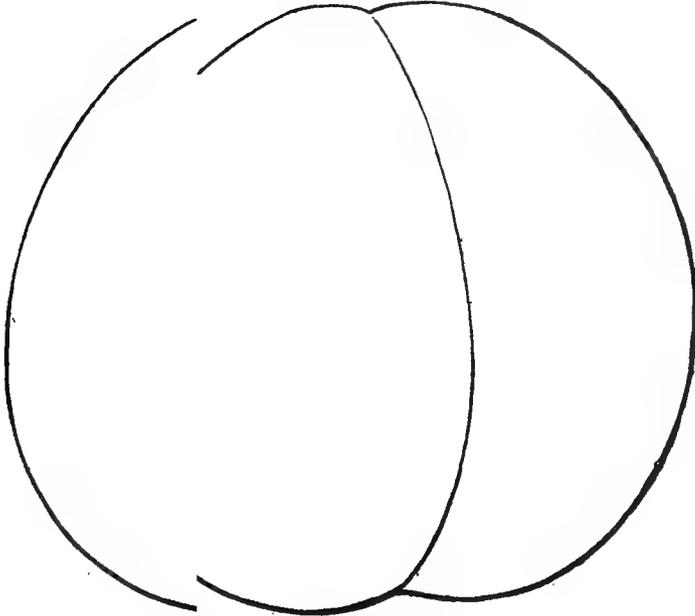


Nectarine Peach

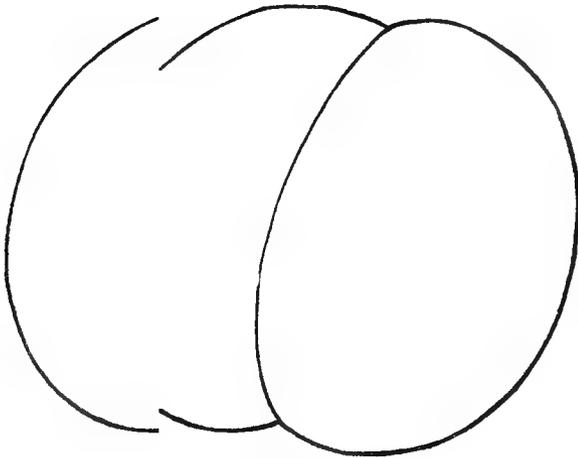


Prince of Wales

PEACHES

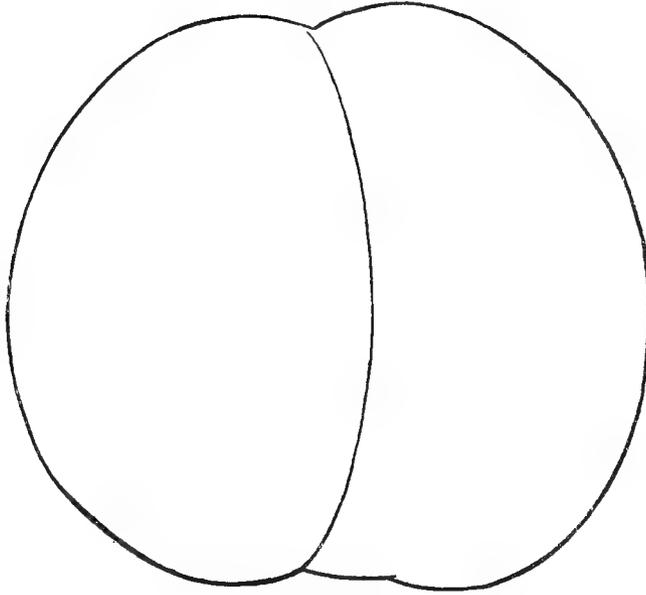


Princess of Wales

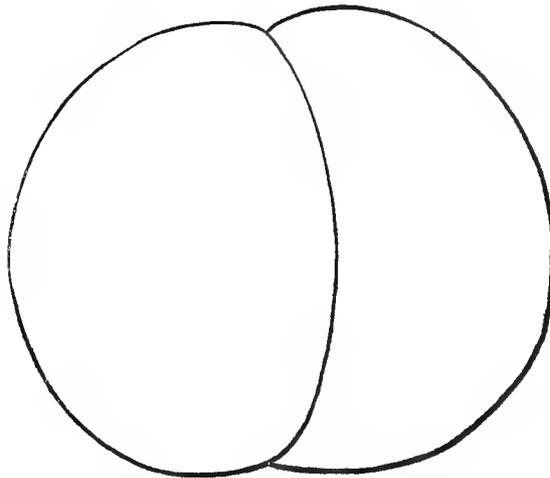


Rivers' Early York

PEACHES

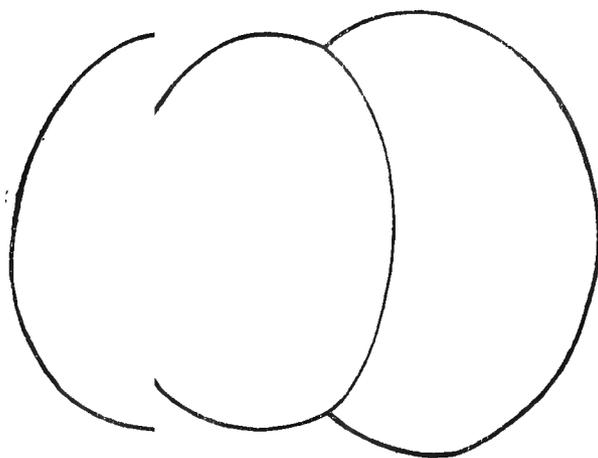


Sea Eagle

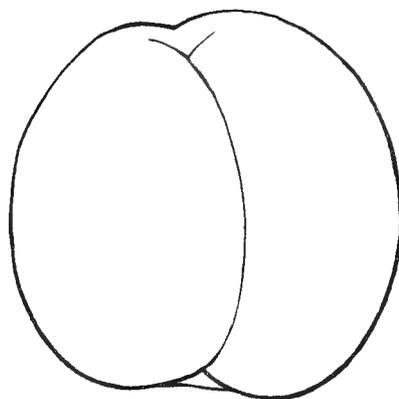


Stirling Castle

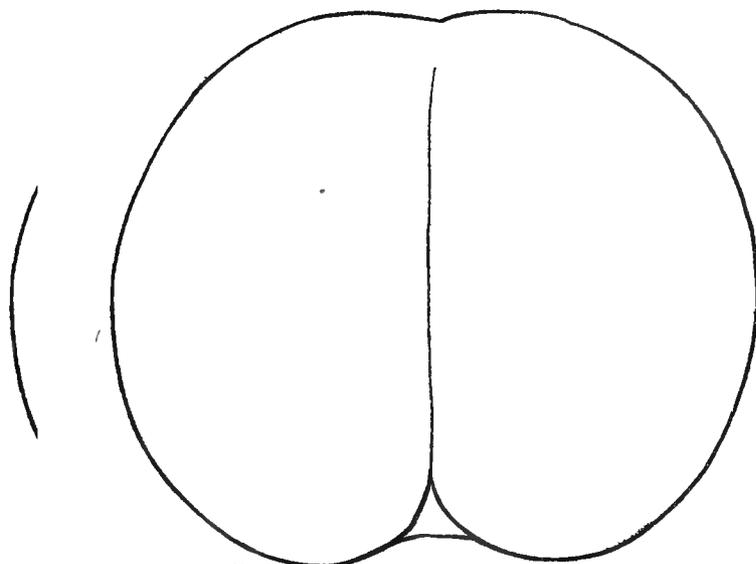
PEACHES



Violette Hâtive

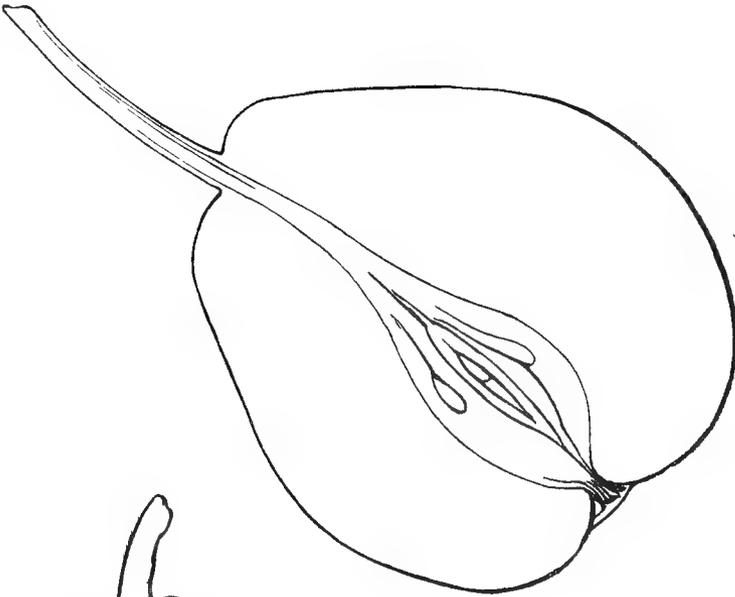


Waterloo

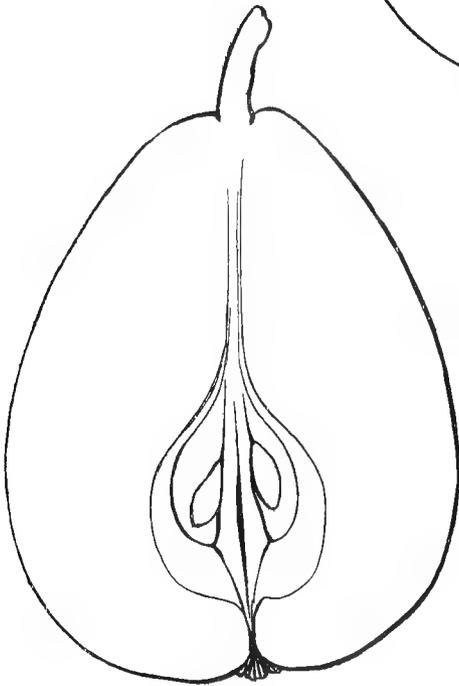


Walburton Admirable

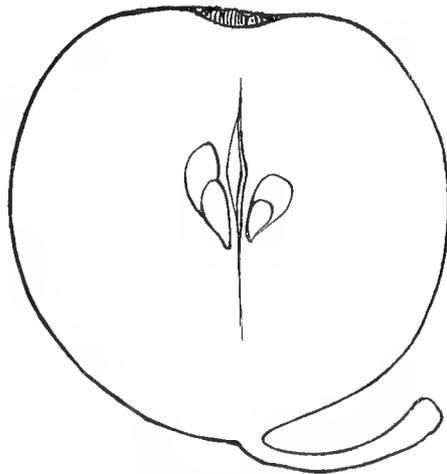
PEARS



Aspasia Aucourt



Beacon



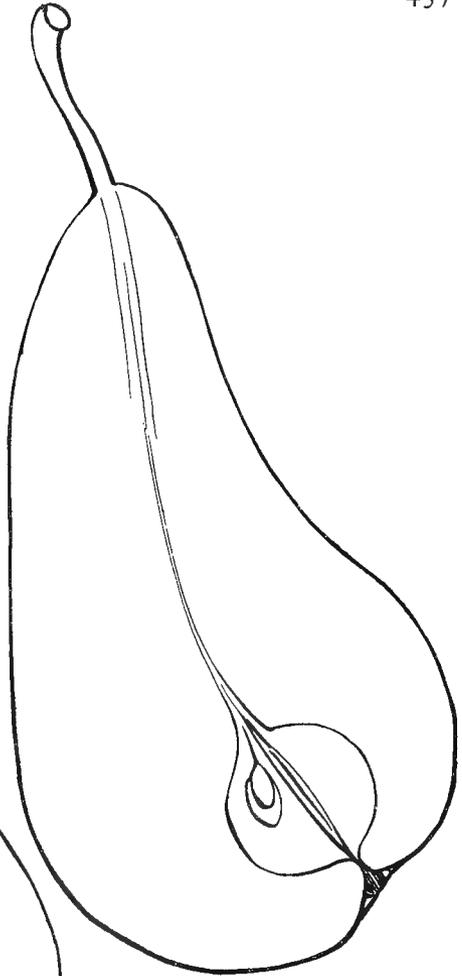
Bergamotte Esperen

PEARS

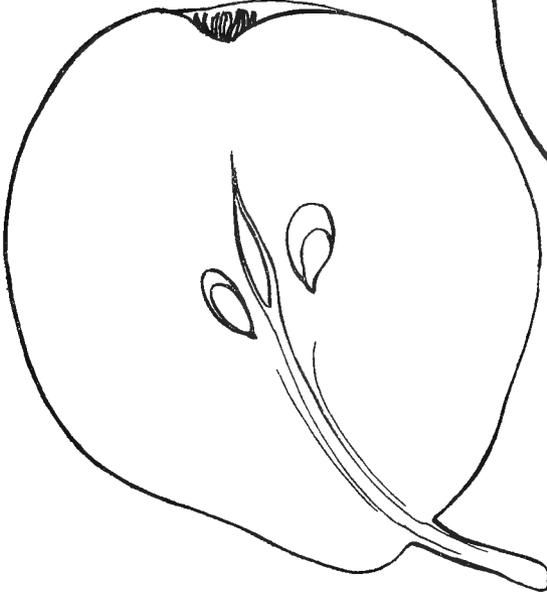
457



Belle Julie

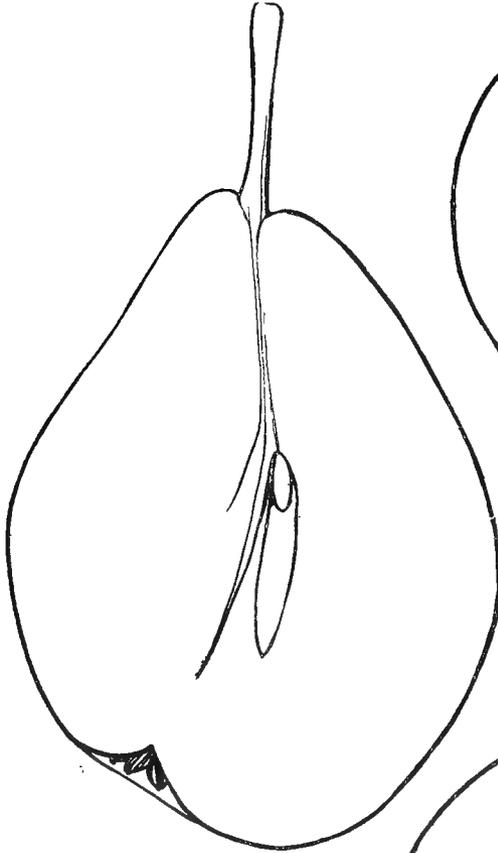


Beurré Bosc

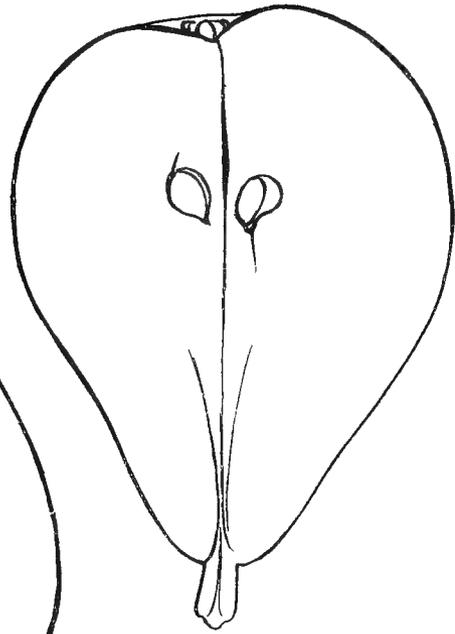


Bellissime d'Hiver

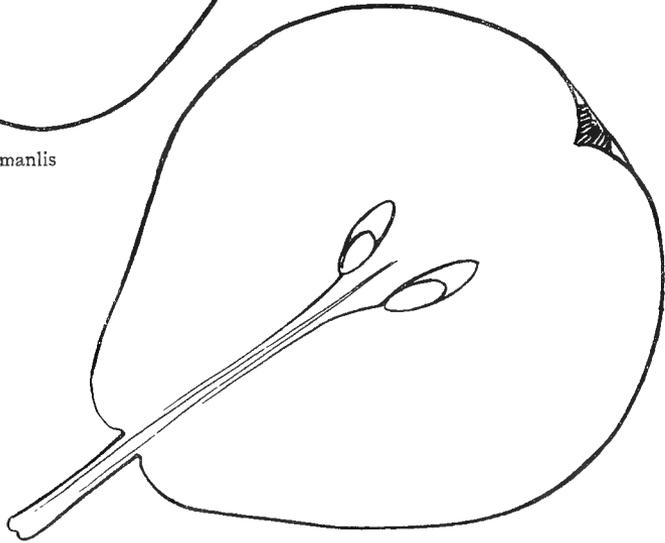
PEARS



Beurré d'Amanlis



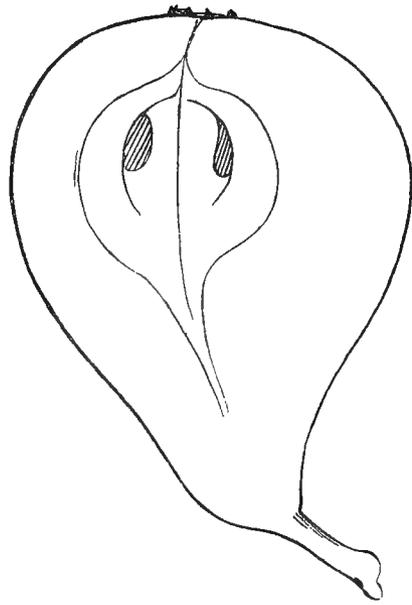
Beurré de Jonghe



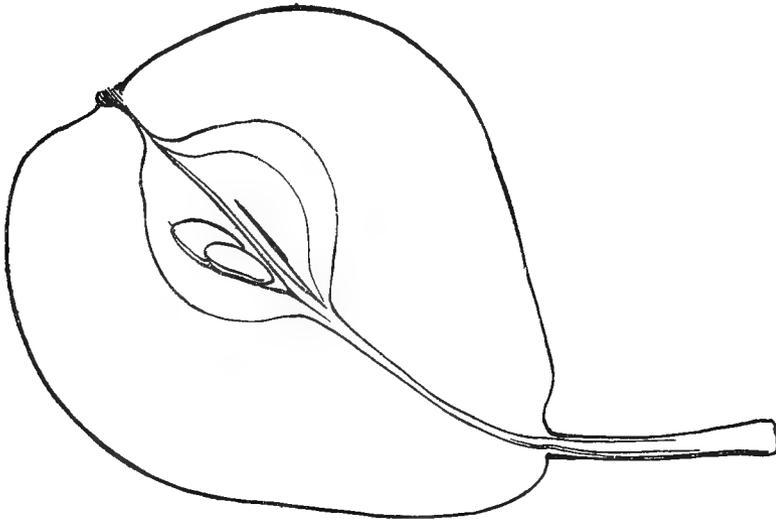
Beurré Diel



Beurré du Buisson

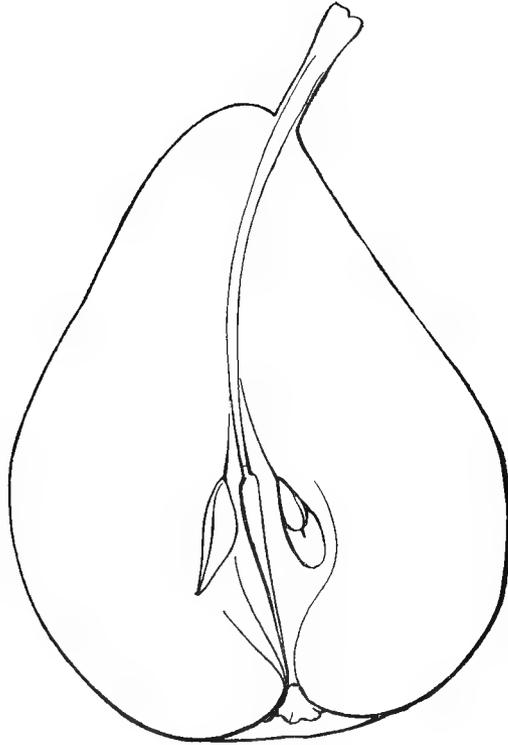


Beurré Giffard

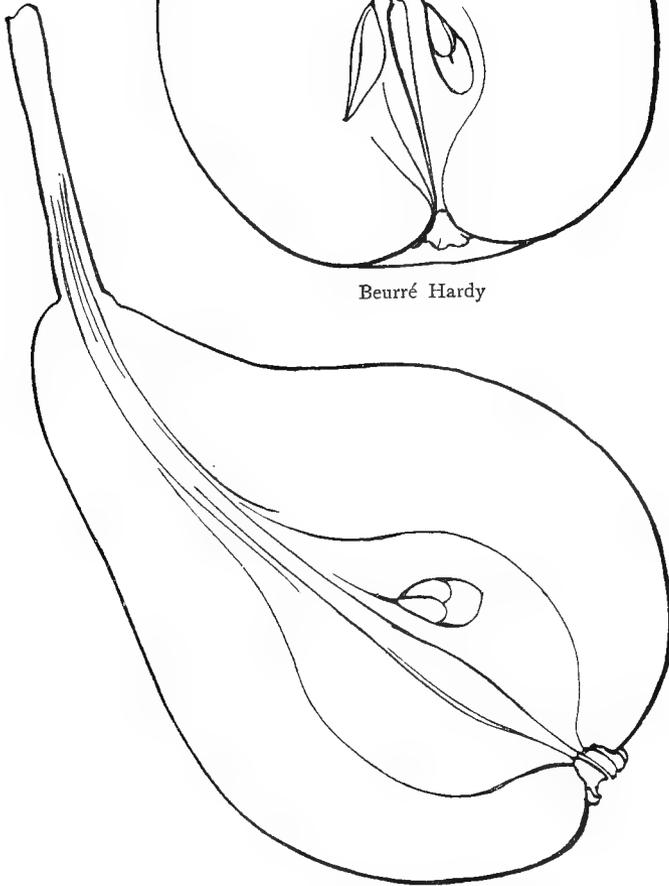


Beurré Fouqueray

PEARS



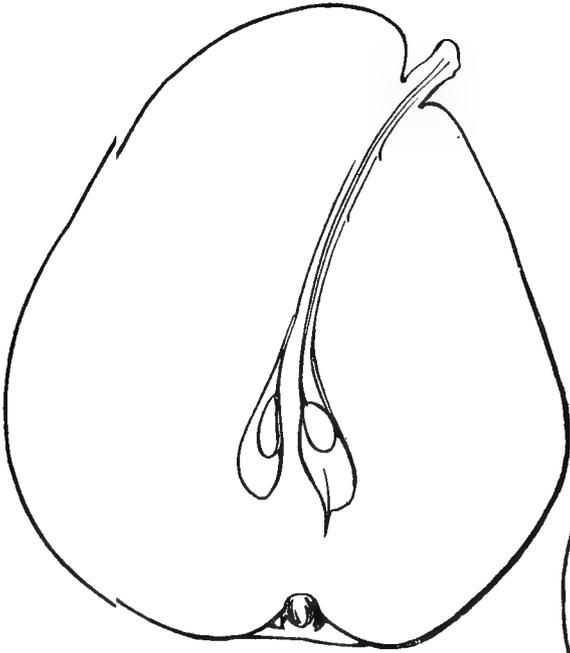
Beurré Hardy



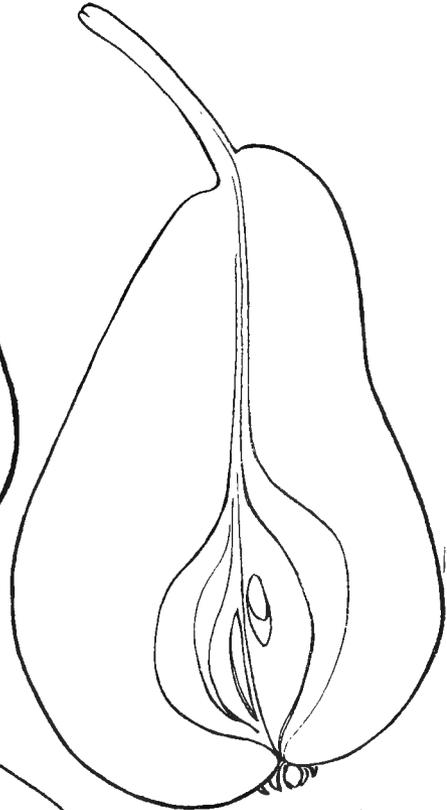
Beurré Jean van Geert

PEARS

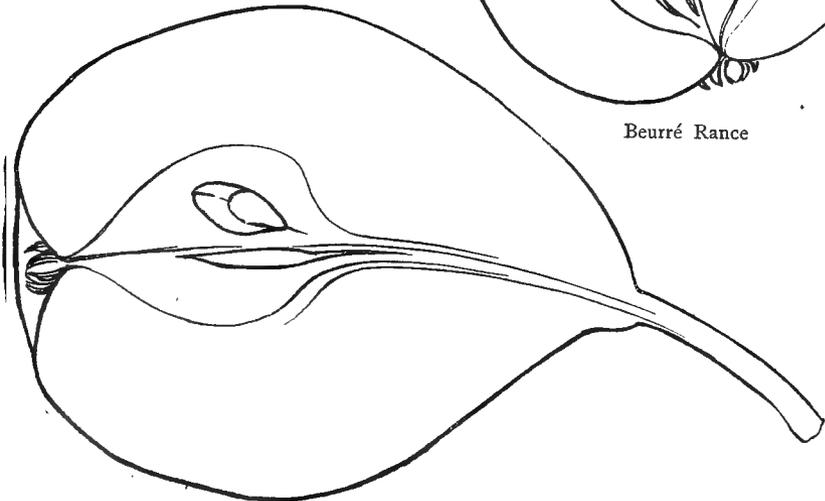
461



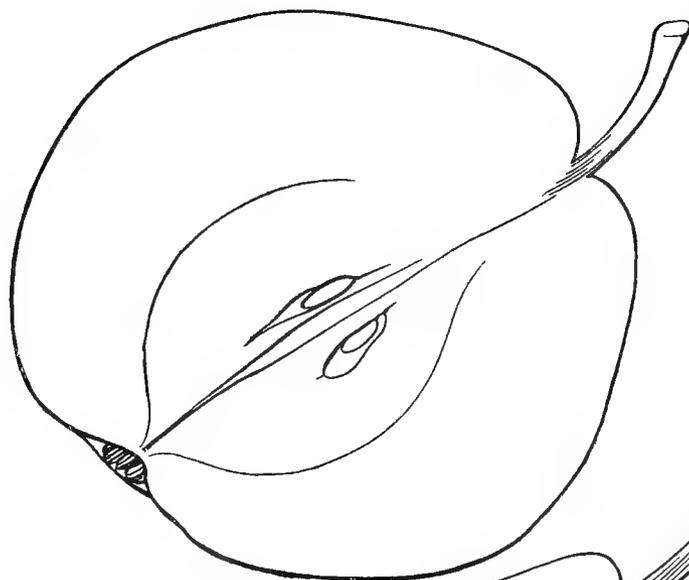
Beurré Mortillet



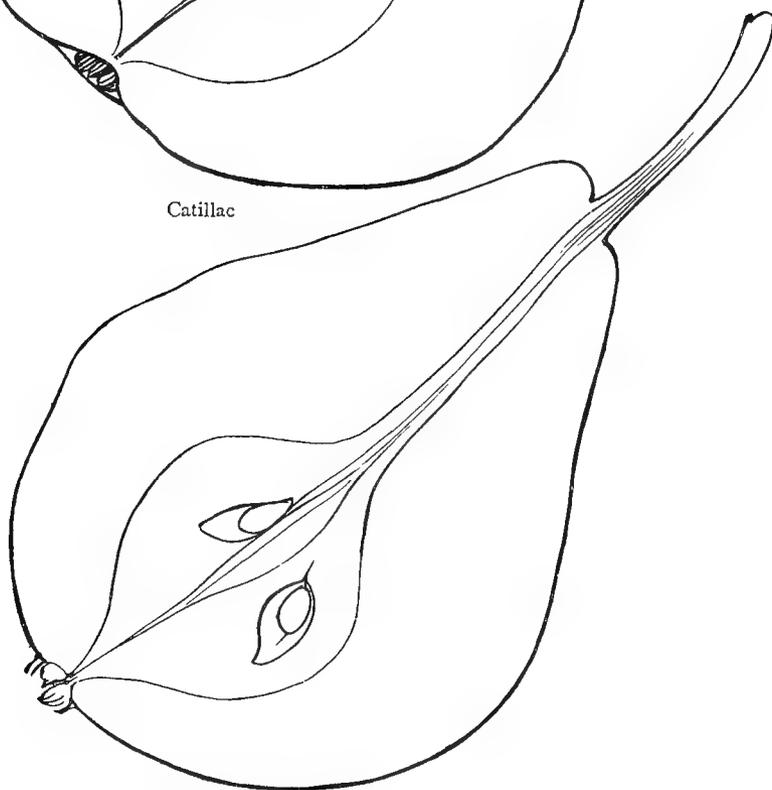
Beurré Rance



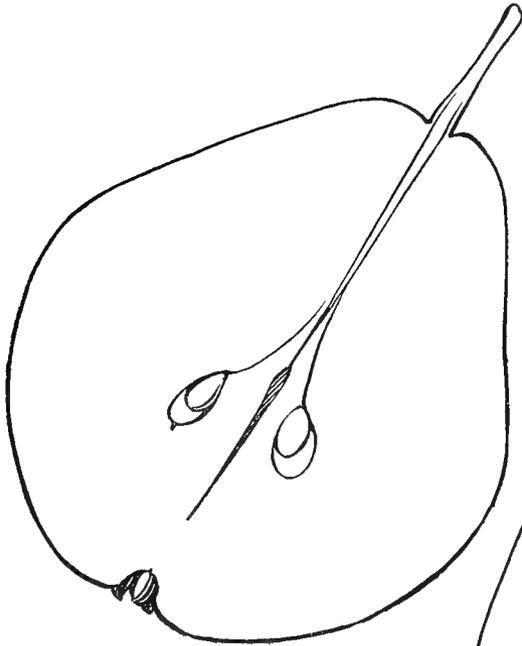
Beurré Superfin



Catillac



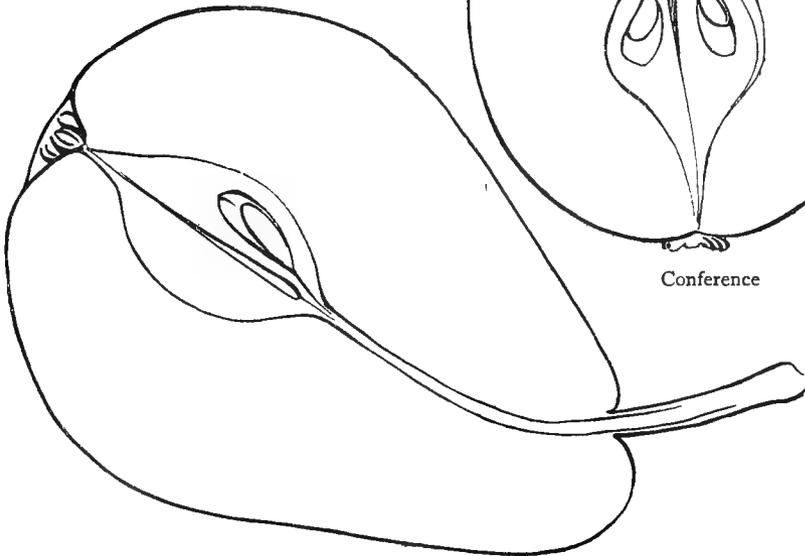
Clapp's Favourite



Colmar d'Été



Conference

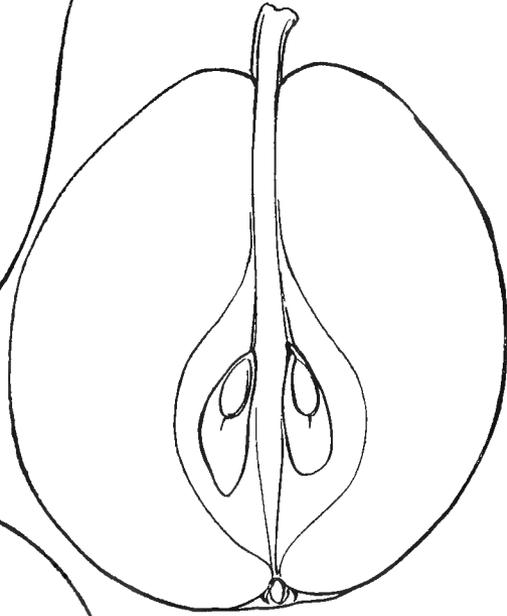


Conseiller de la Cour

PEARS



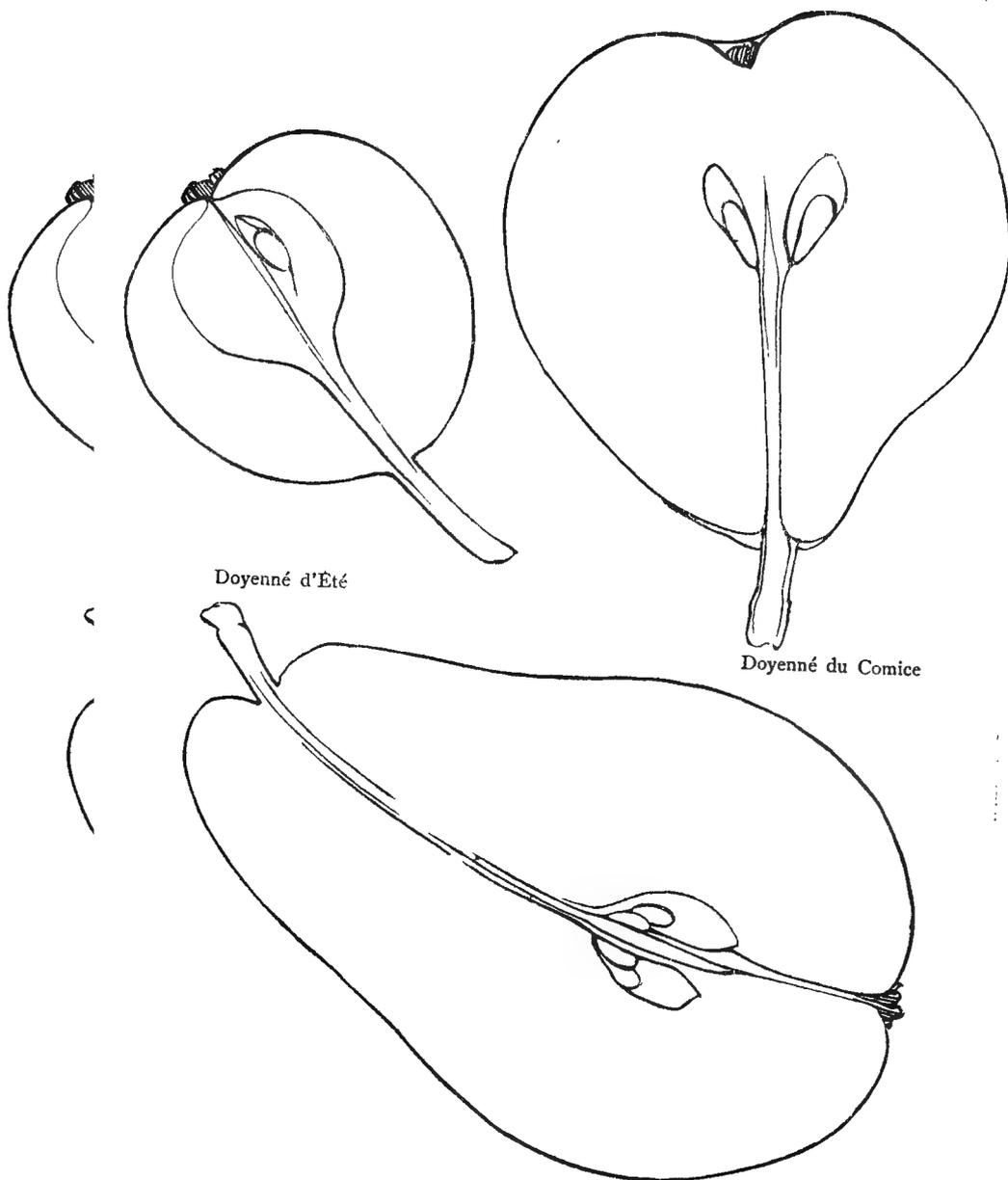
Directeur Hardy



Doyenné d'Alençon



Doyenné Boussoch

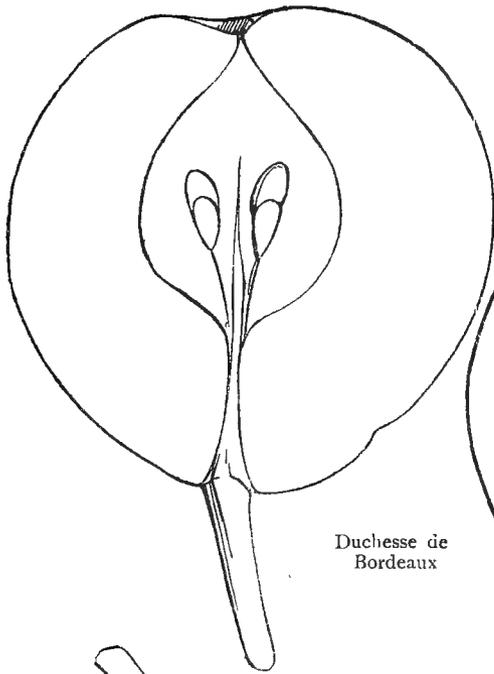


Doyenné d'Été

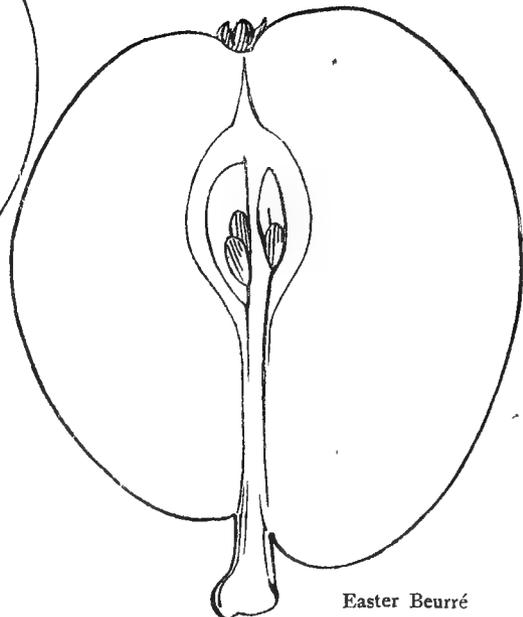
Doyenné du Comice

Dr. Jules Guyot

PEARS



Duchesse de
Bordeaux



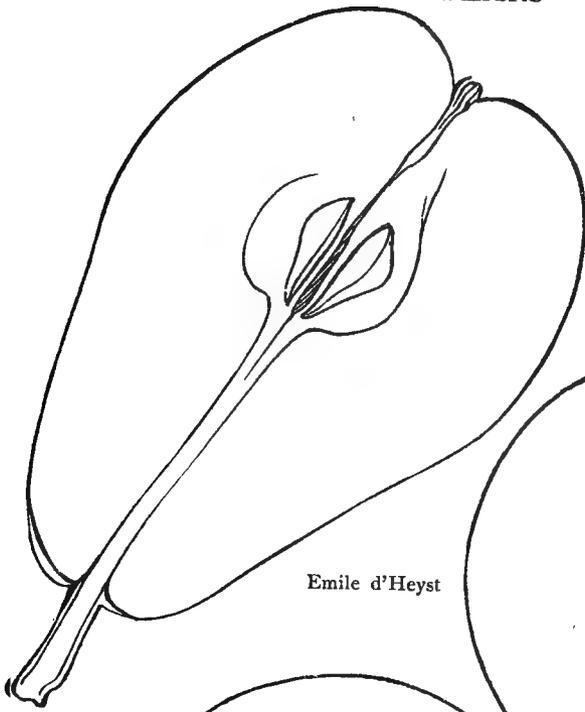
Easter Beurré



Durondeau

PEARS

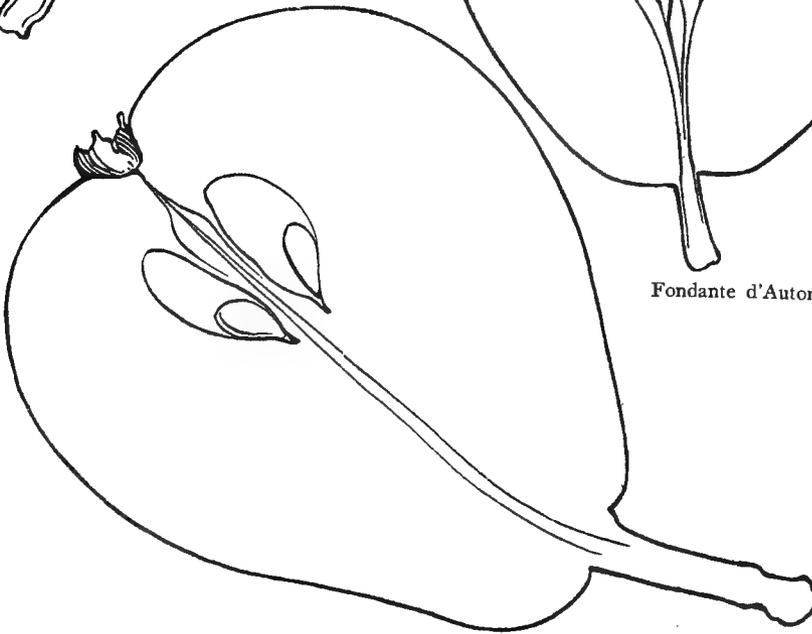
467



Emile d'Heyst

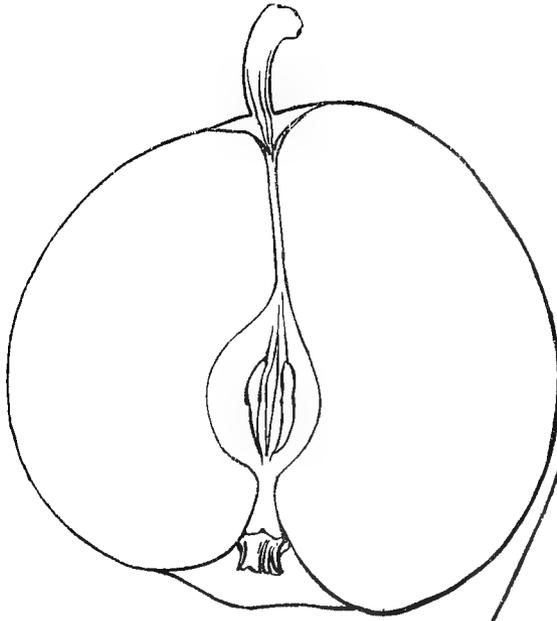


Fondante d'Automne

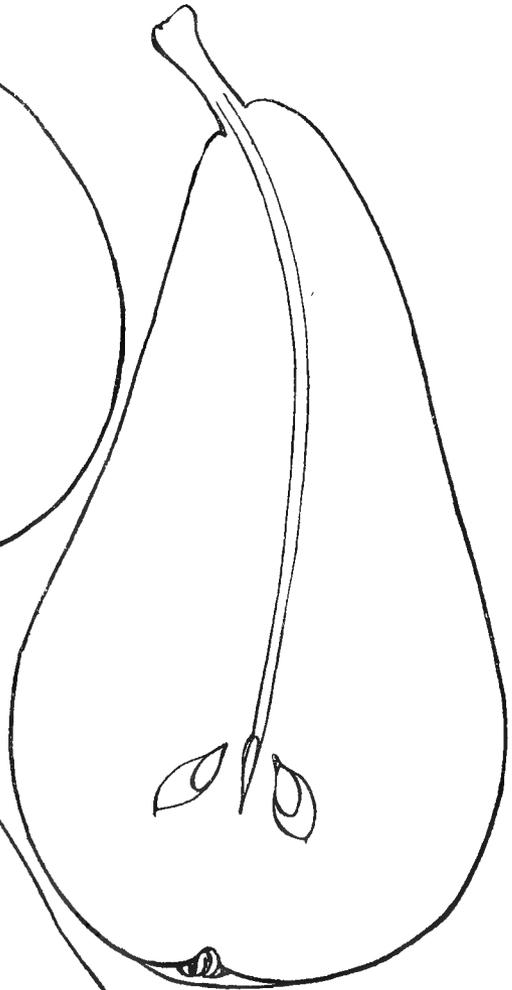


Fondante de Thirriot

PEARS



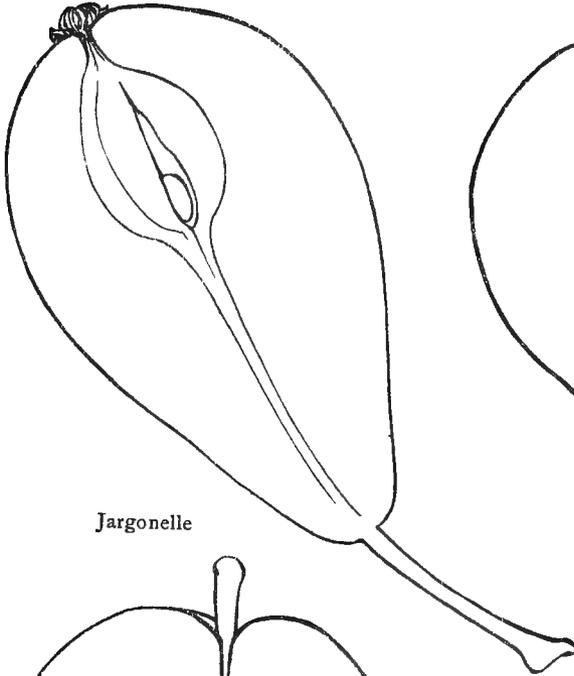
Gilgil



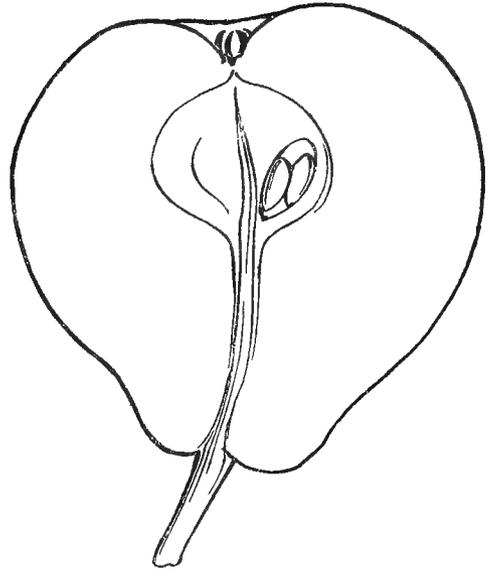
Grosse Calebasse



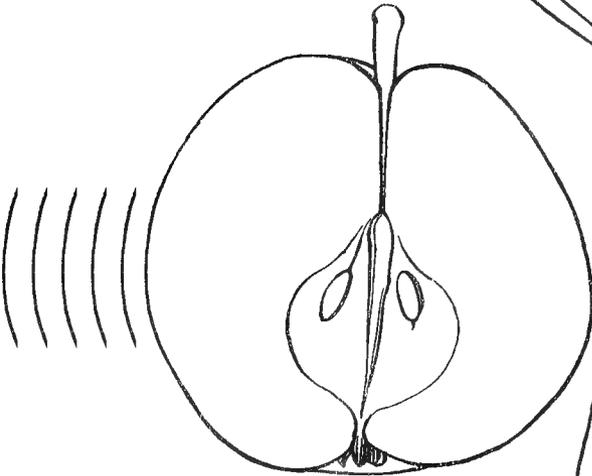
Glou Morceau



Jargonelle



Josephine de Malines

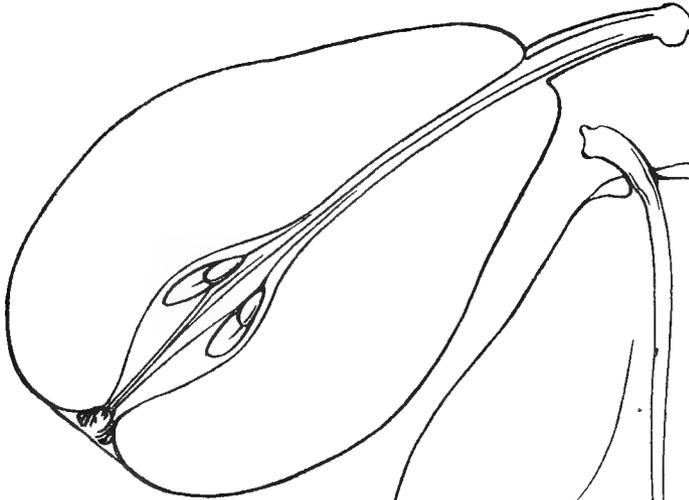


Knight's Monarch

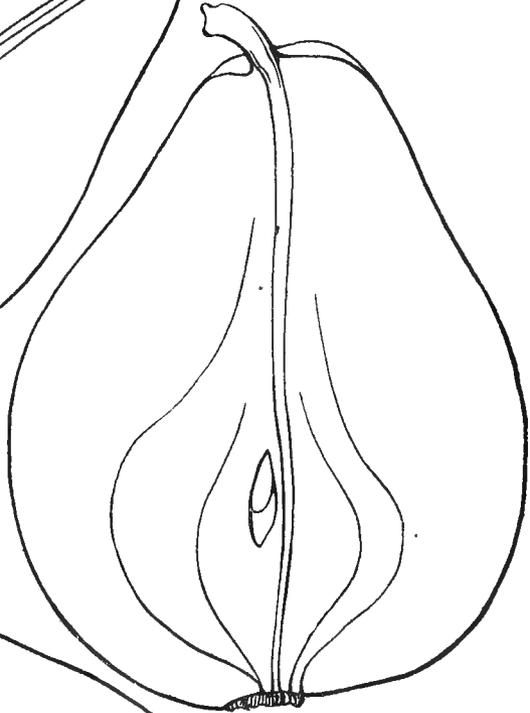


Le Lectier

PEARS



Louise Bonne of Jersey



Marie Benoist



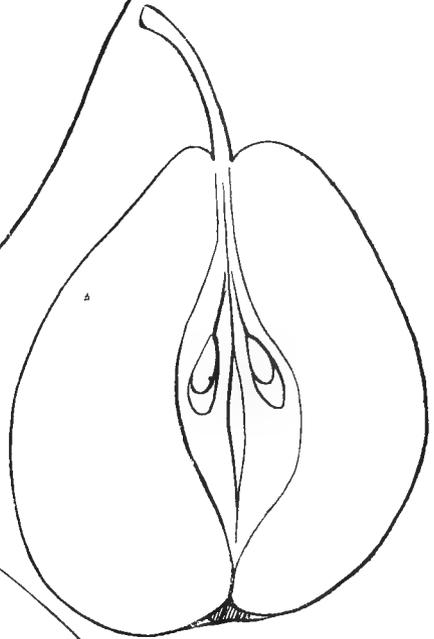
Marguerite Marillat

PEARS

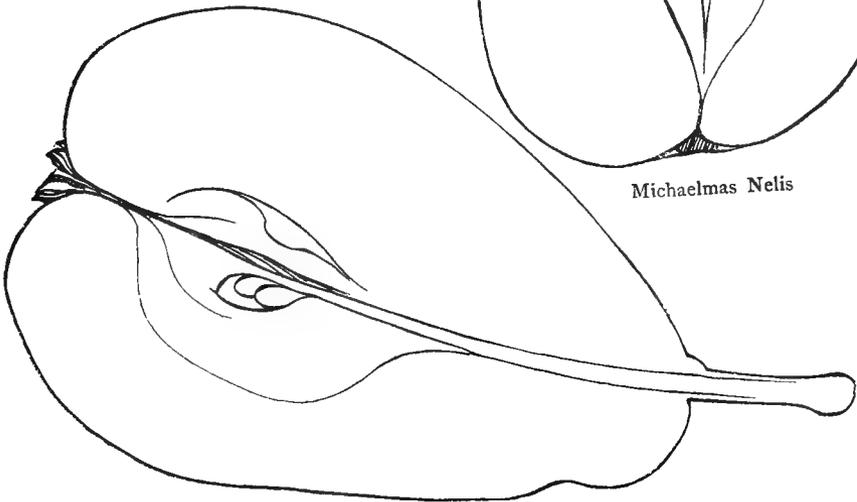
471



Marie Louise d'Uccle

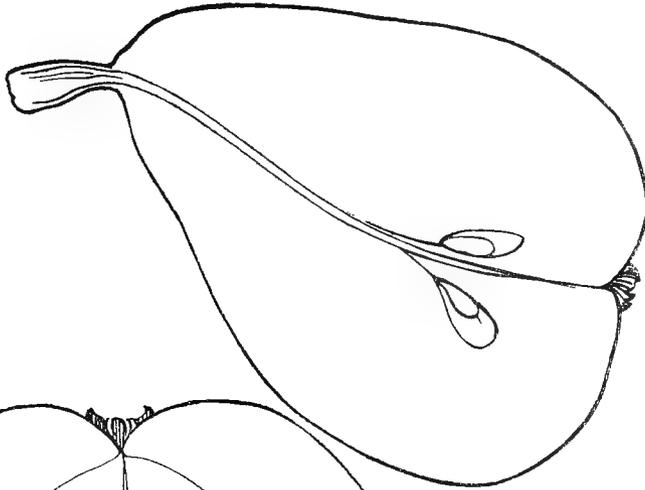


Michaelmas Nelis

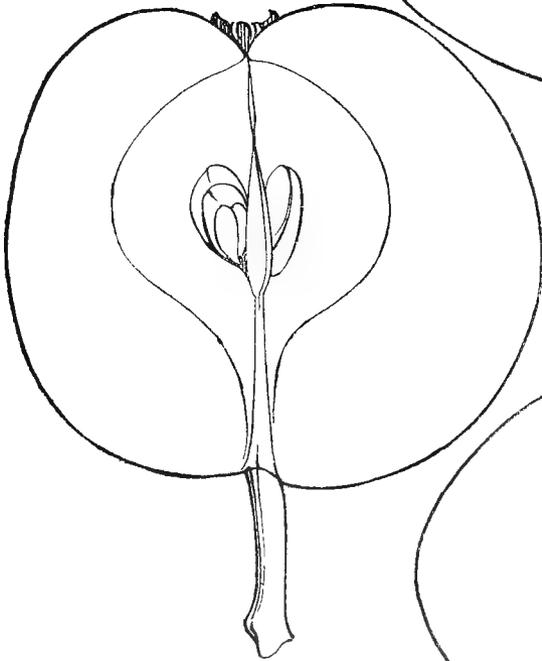


Marie Louise

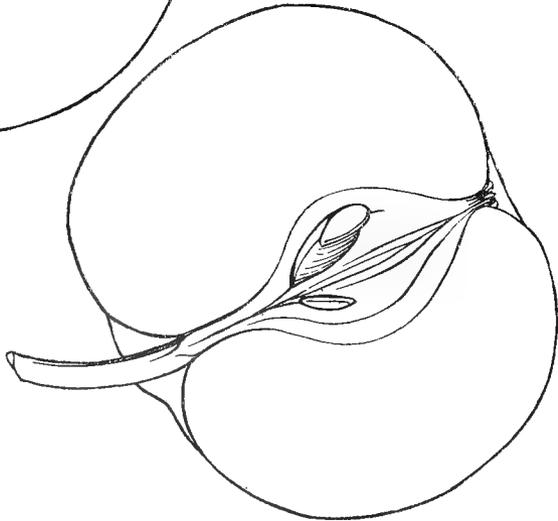
PEARS



Nouvelle Fulvie



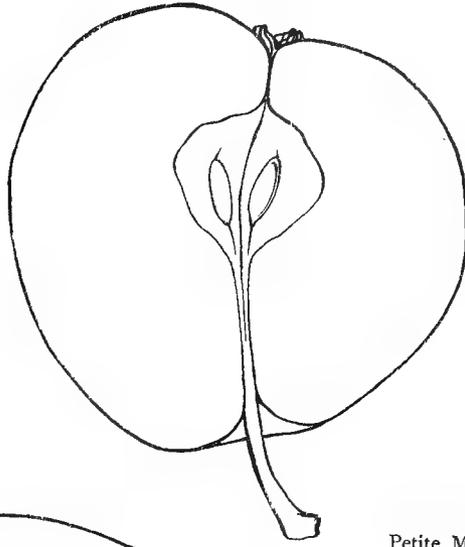
Passe Crassane



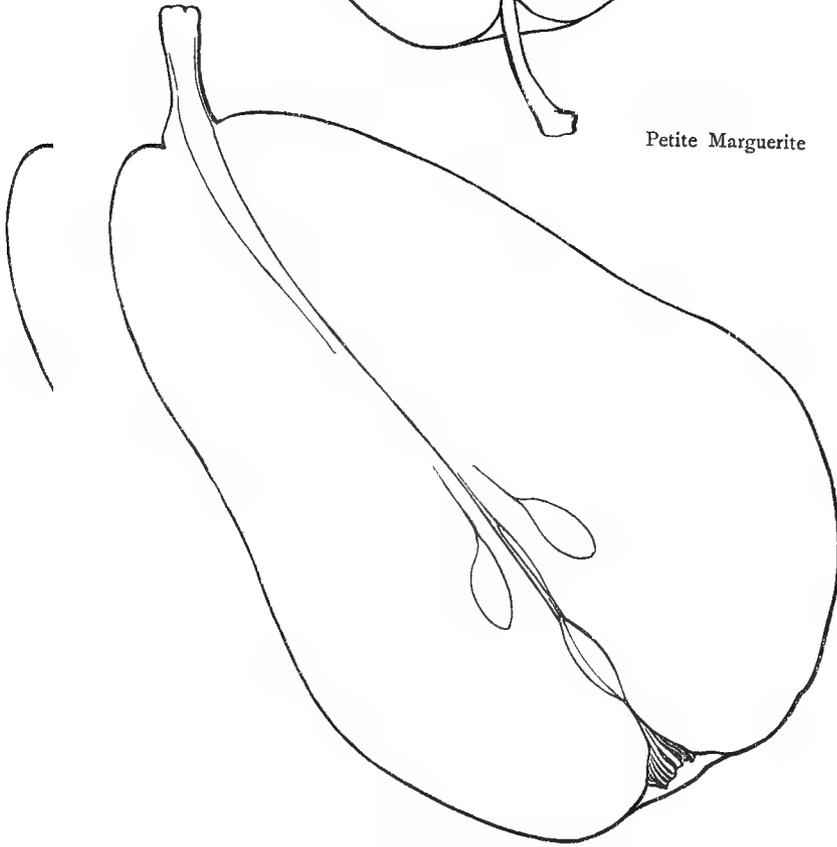
Olivier de Serres

PEARS

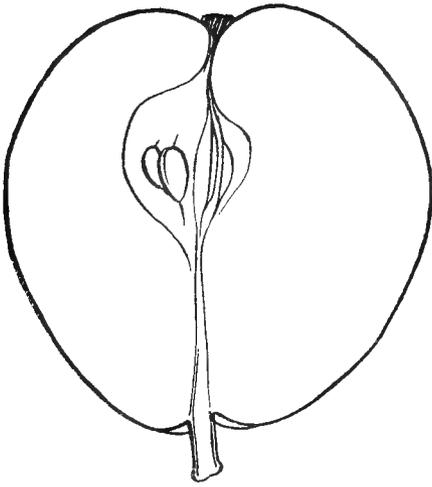
473



Petite Marguerite



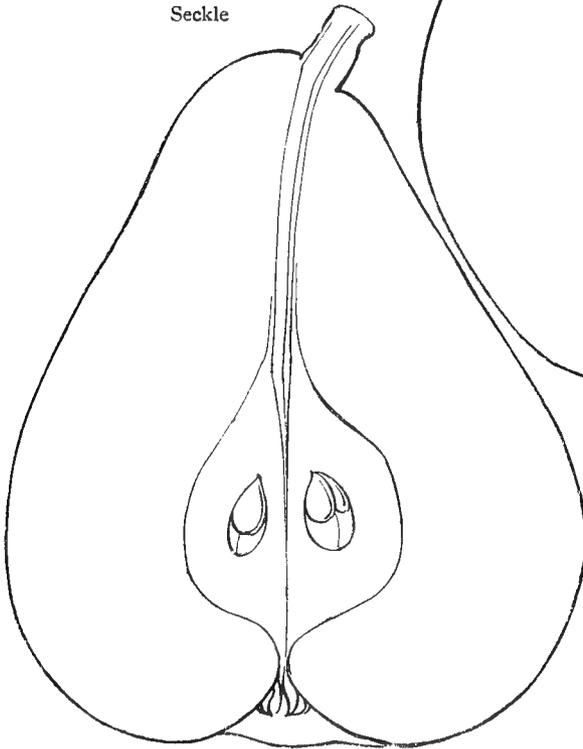
Pitmaston Duchess



Seckle

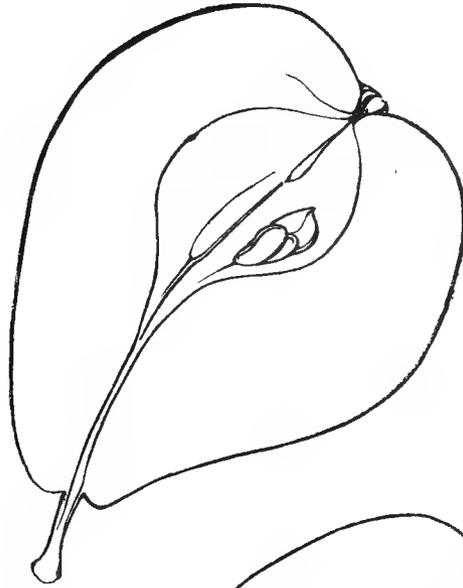


Princess

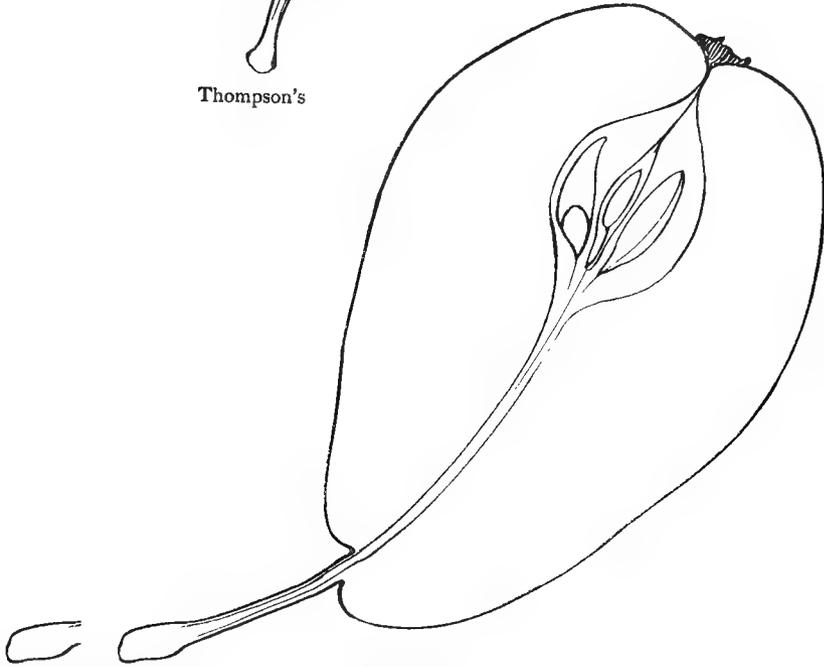


Souvenir du Congrès

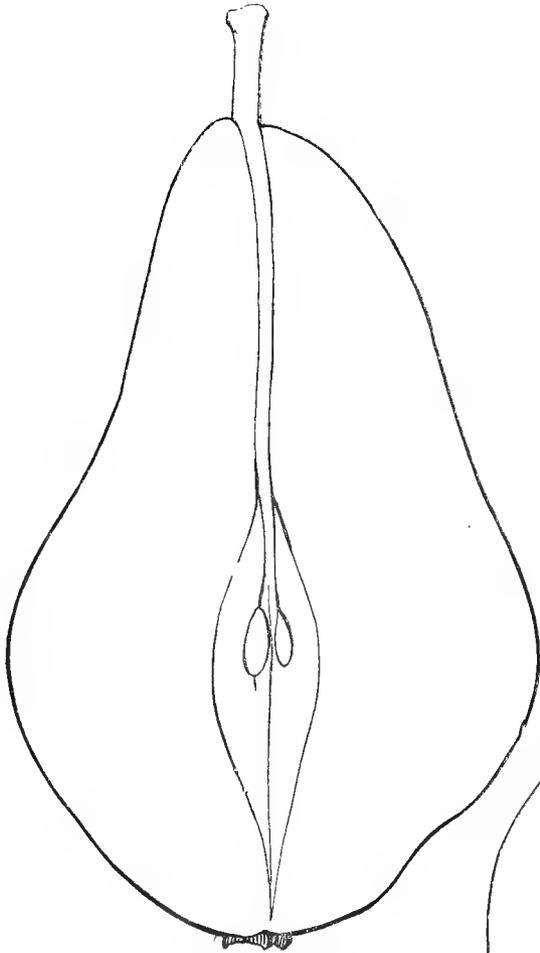
PEARS



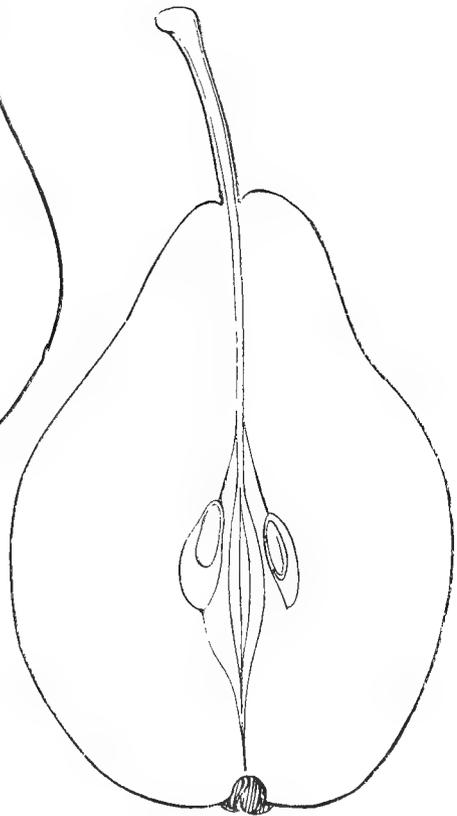
Thompson's



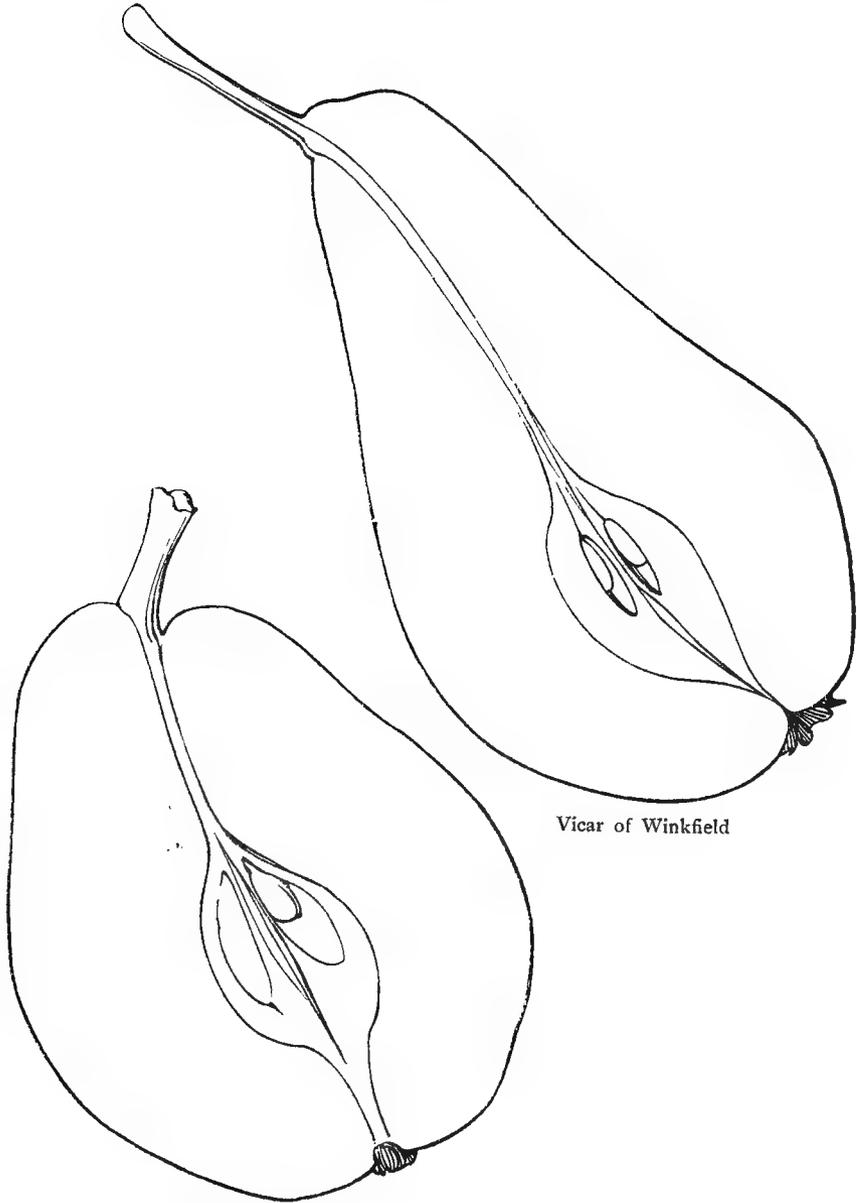
Triomphe de Vienne



Uvedale's St. Germain



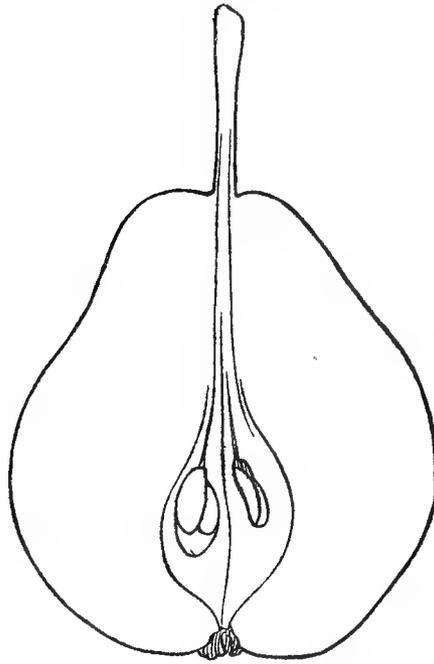
Verulam



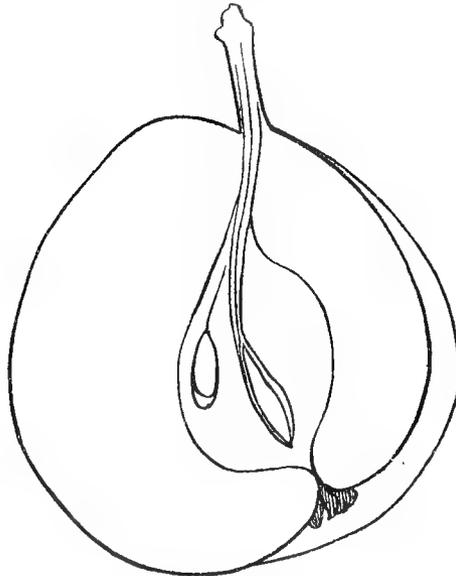
Vicar of Winkfield

Williams' Bon Chrétien

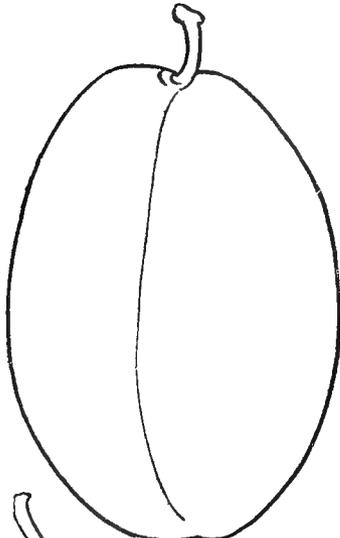
PEARS



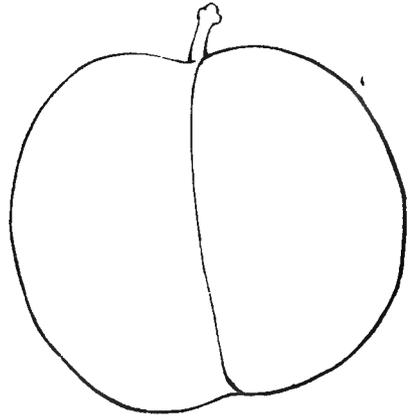
Winter Nelis



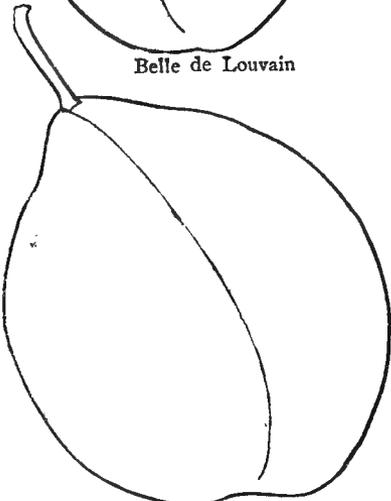
Zéphirin Grégoire



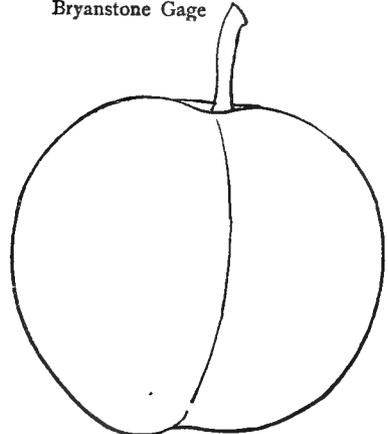
Belle de Louvain



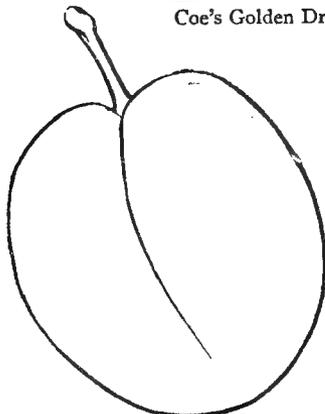
Bryanstone Gage



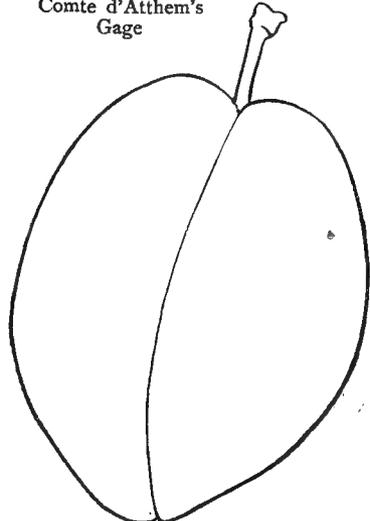
Coe's Golden Drop



Comte d'Atthem's
Gage

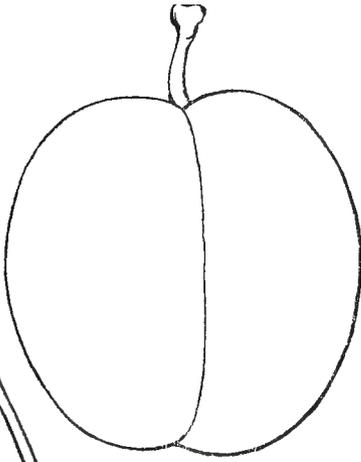


Denniston's Superb

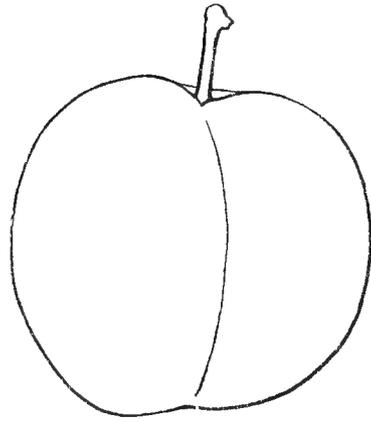


Diamond

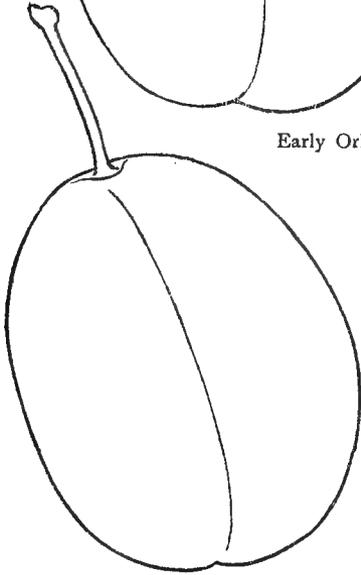
PLUMS



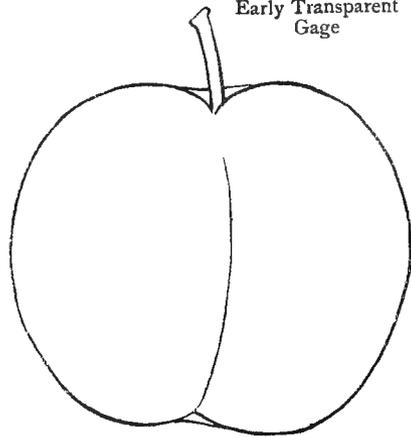
Early Orléans



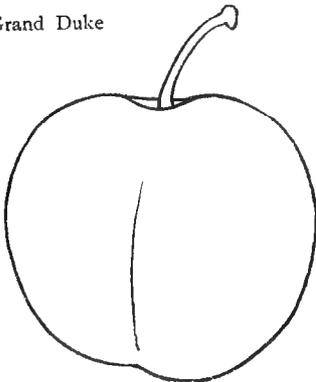
Early Transparent Gage



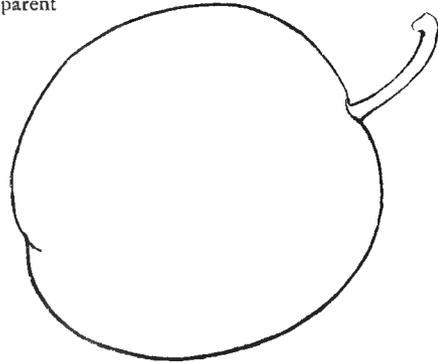
Grand Duke



Golden Trans-
parent



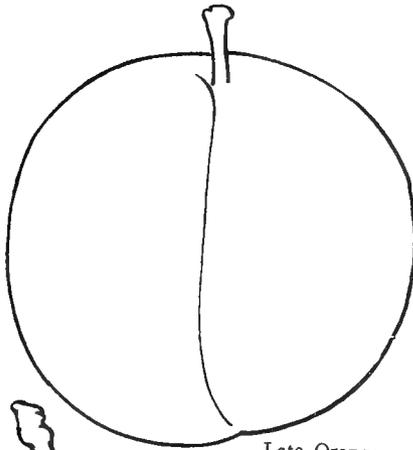
Green Gage



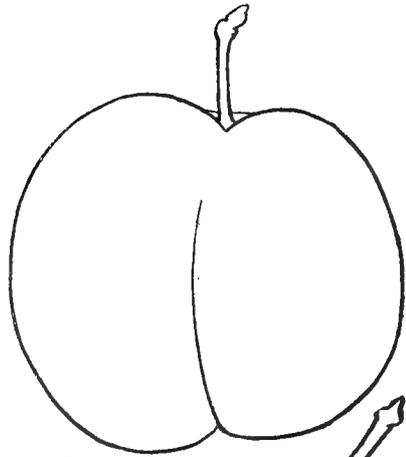
Kirke's

PLUMS

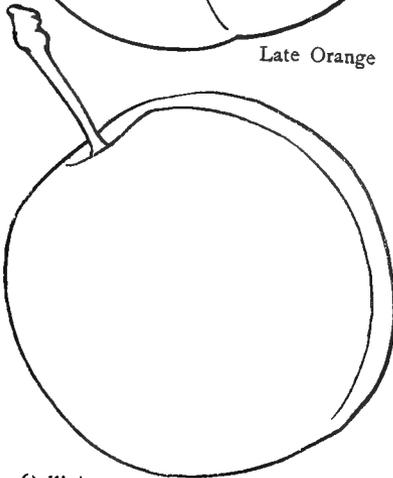
481



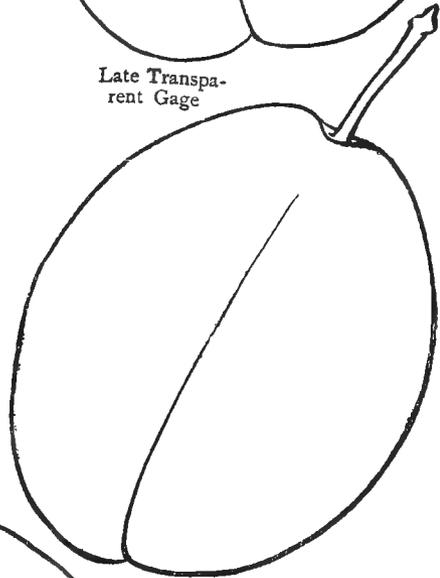
Late Orange



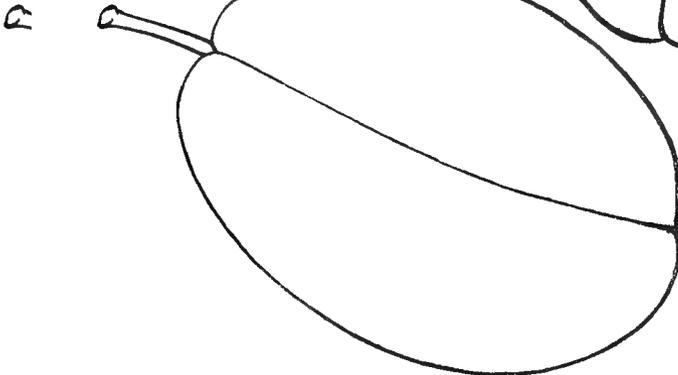
Late Transpa-
rent Gage



Oullin's
Golden Gage

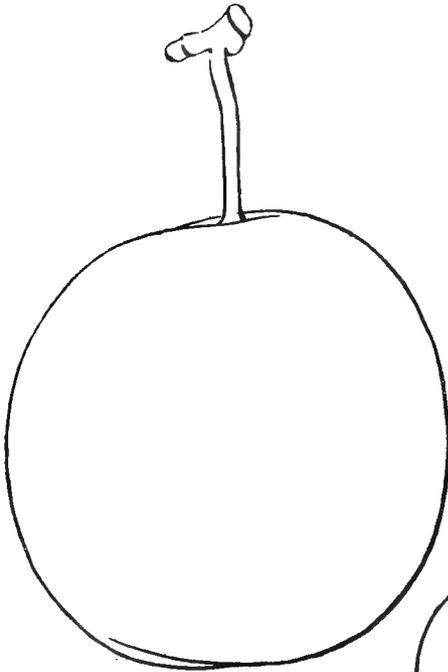


Pond's Seedling

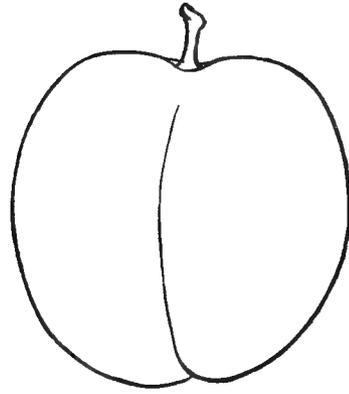


President

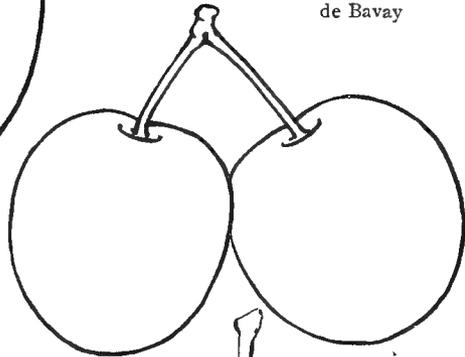
PLUMS



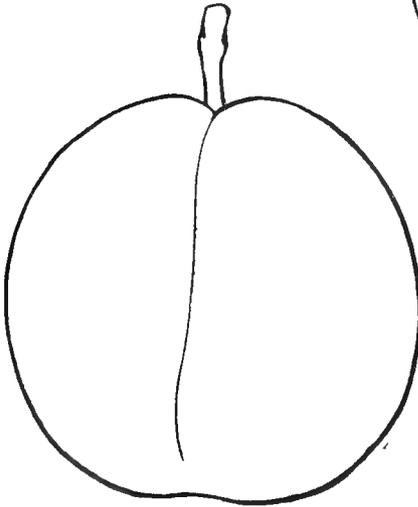
Primate



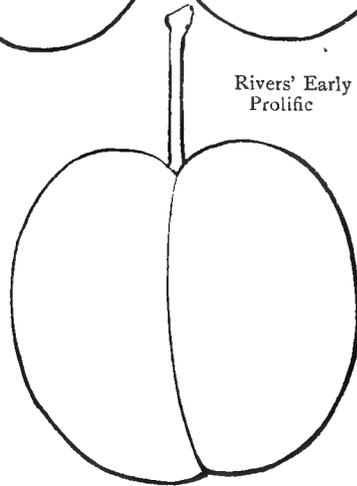
Reine Claude
de Bavay



Rivers' Early
Prolific

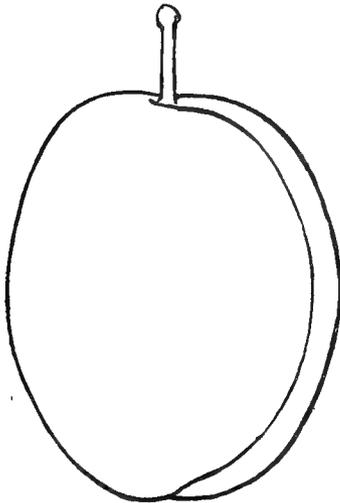


Sultan

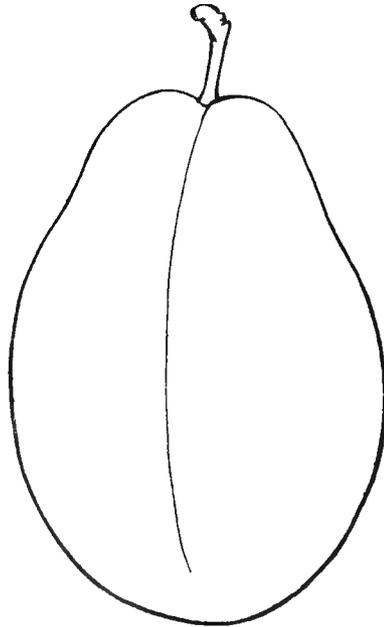


The Czar

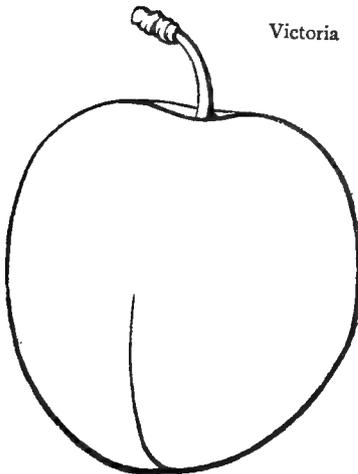
PLUMS



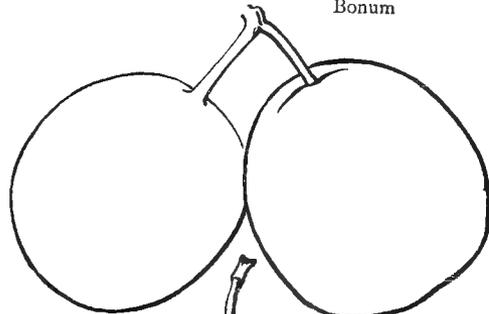
Victoria



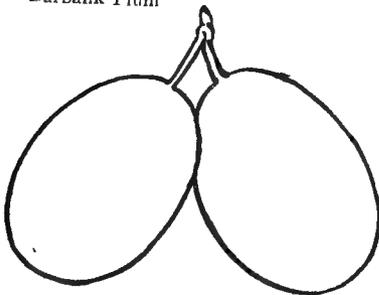
White Magnum
Bonum



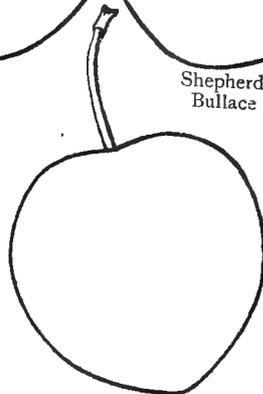
Burbank Plum



Shepherd's
Bullace

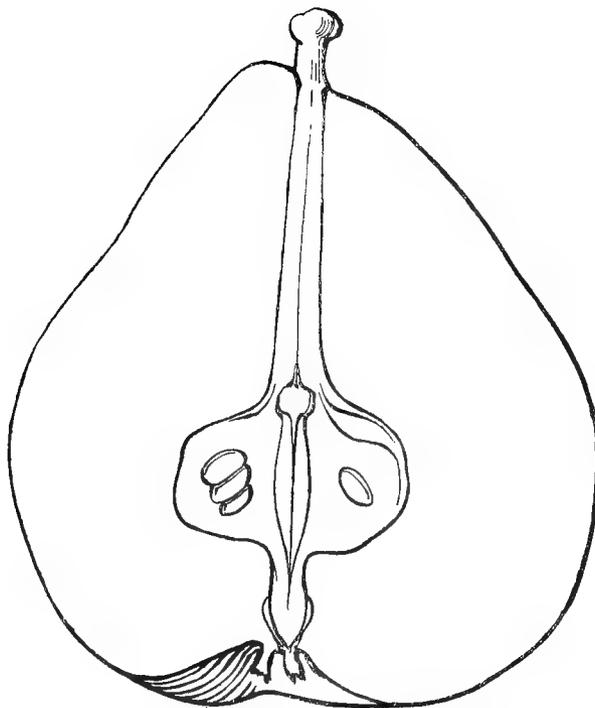


Shropshire Damson



The Myrobelle or Cherry Plum

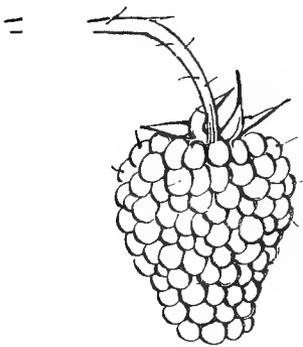
QUINCE



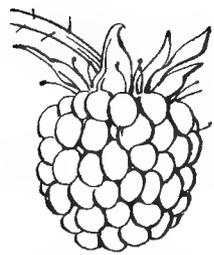
The Pear-Shaped Quince



White Magnum Bonum

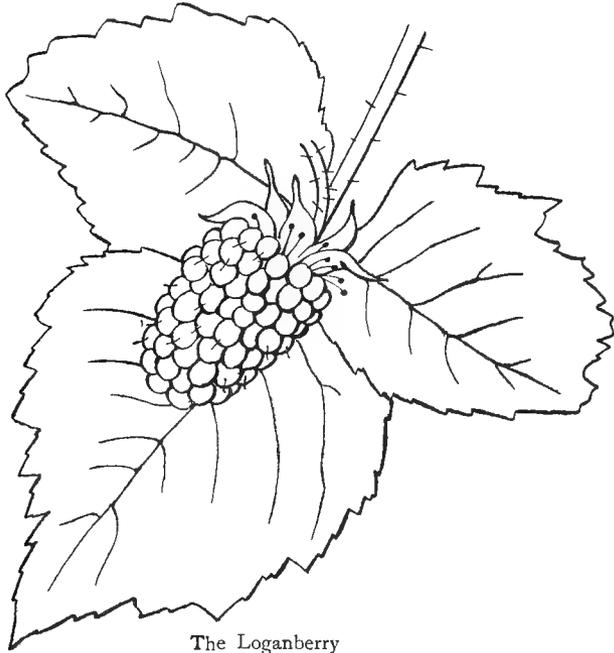


Superlative (red)



Carter's Prolific (red)

LOGANBERRY AND WINEBERRY

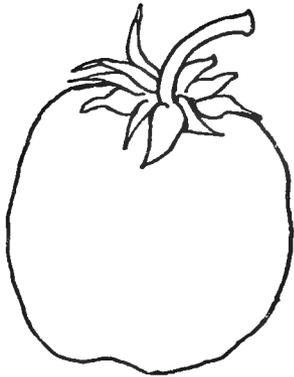


The Loganberry

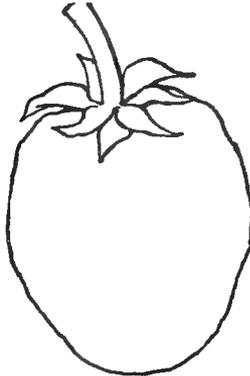


The Wineberry

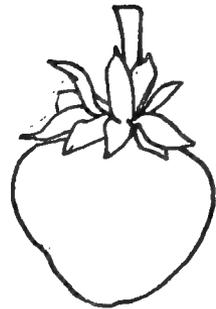
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Auguste Nicaise



Auguste Nicaise



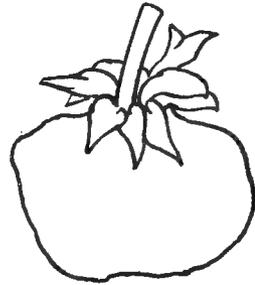
Black Prince



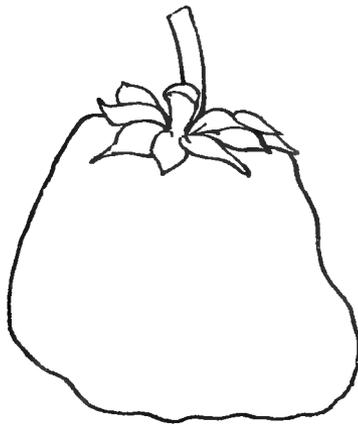
British Queen



British Queen



Black Prince



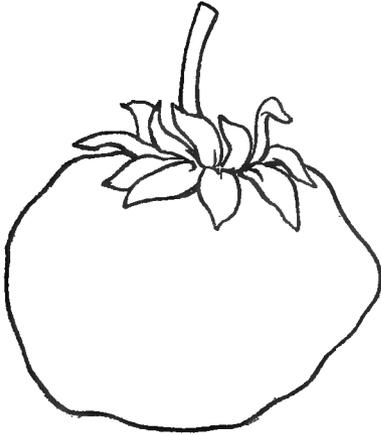
Countess



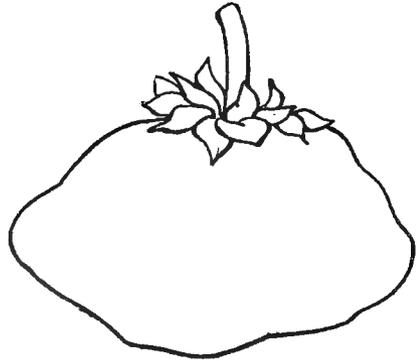
Countess

Note.—Strawberries vary greatly in size and shape. While early fruits of some varieties are large and wedge-shaped, later ones are small and round or oval. The two types are therefore shown.

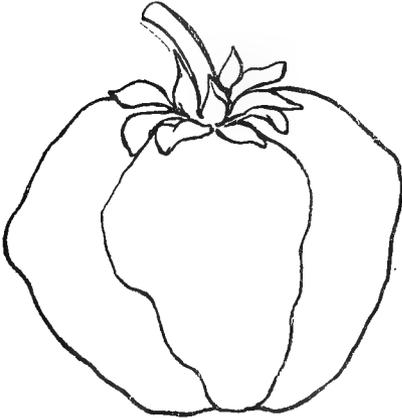
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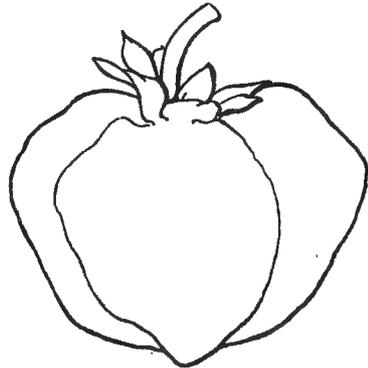
Dr. Hogg



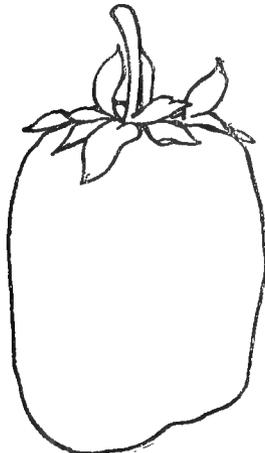
Dr. Hogg



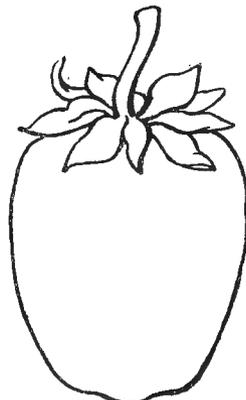
Dumbarton Castle



Dumbarton Castle

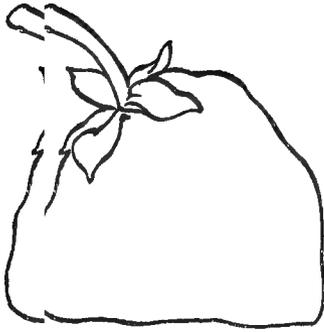


Eleanor

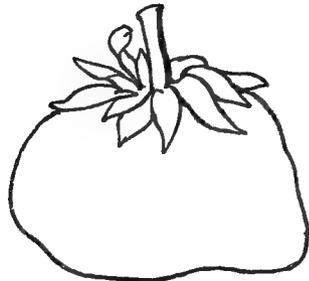


Eleanor

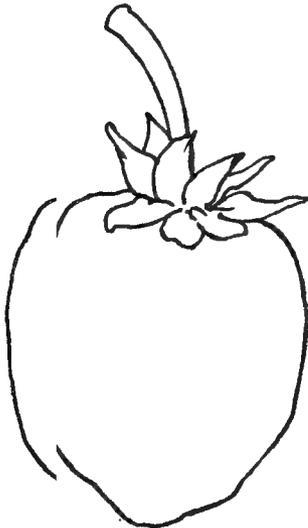
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Elton Pine



Elton Pine



Filbert Pine



Filbert Pine

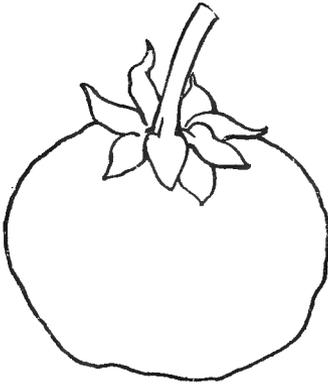


Fillbasket

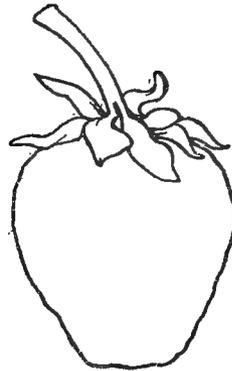


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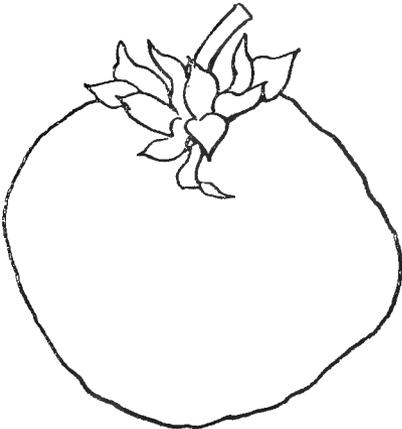
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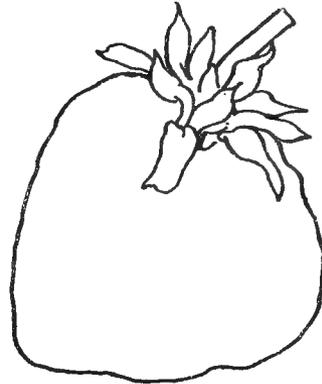
Frogmore Late Pine



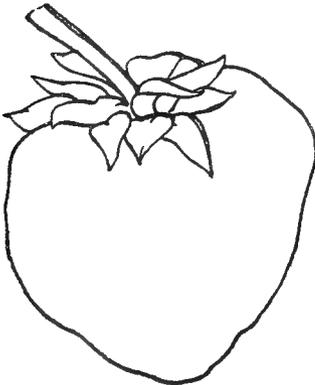
Frogmore Late Pine



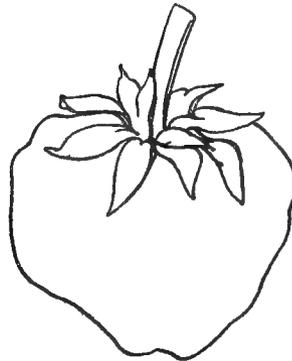
Givon's Late Prolific



Givon's Late Prolific



Kitley's Goliath

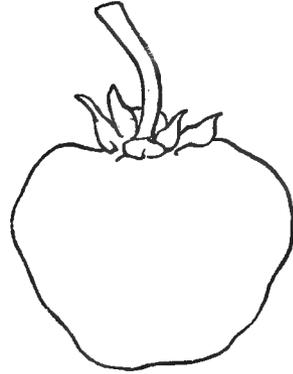


Kitley's Goliath

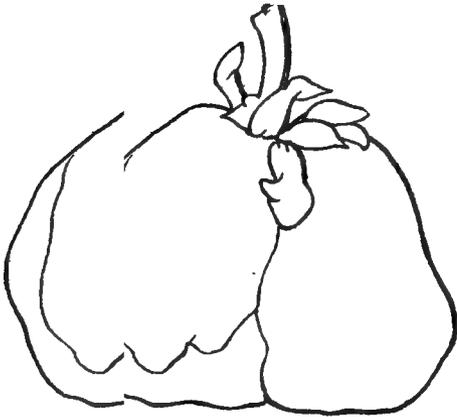
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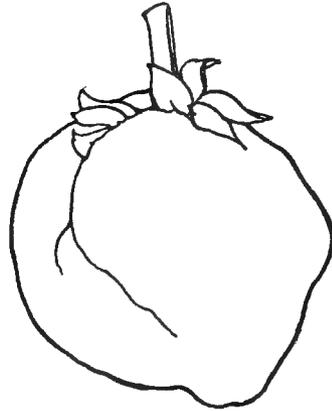
La Grosse Sucrée



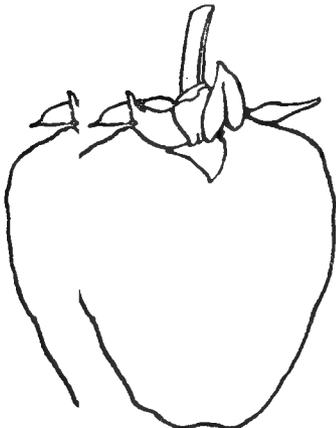
La Grosse Sucrée



Latest of All



Latest of All

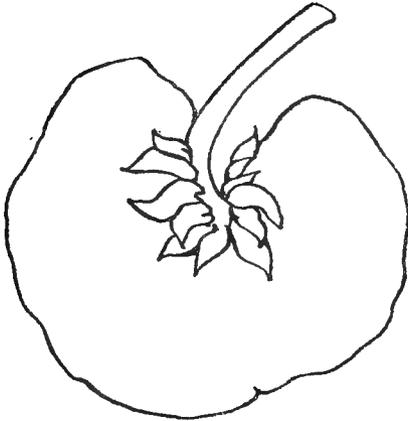


The Laxton

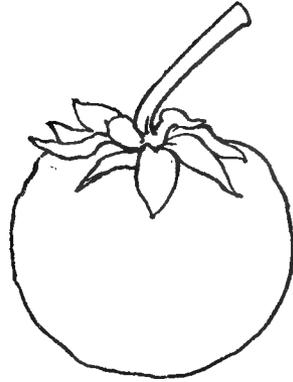


The Laxton

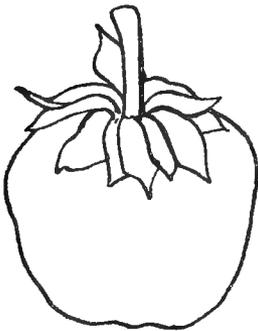
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Louis Gautier



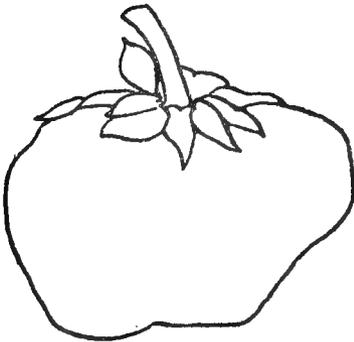
Louis Gautier



Newton Seedling



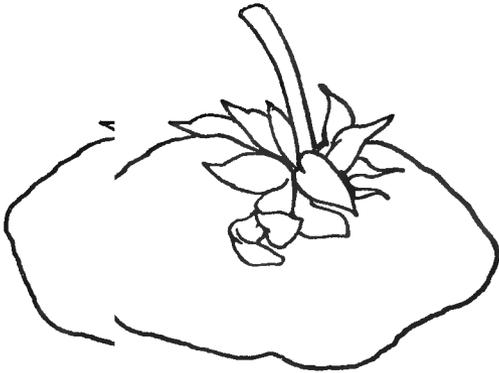
Newton Seedling



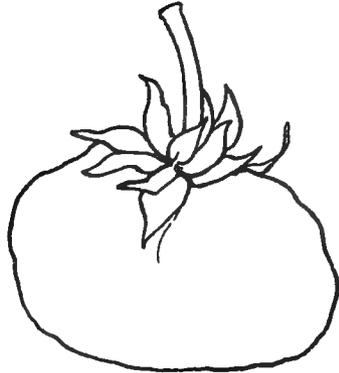
President



President



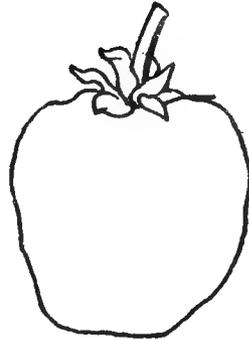
Queen of Denmark



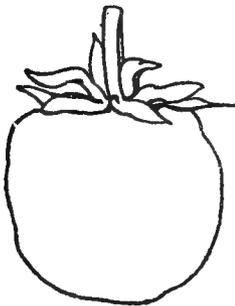
Queen of Denmark



Royal Sovereign



Royal Sovereign

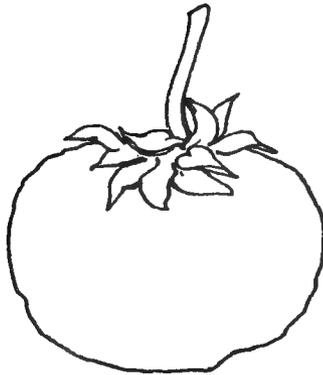


St. Joseph



St. Joseph

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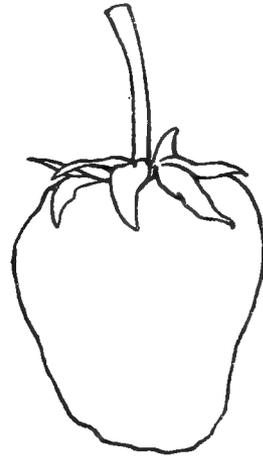
Sir Charles Napier



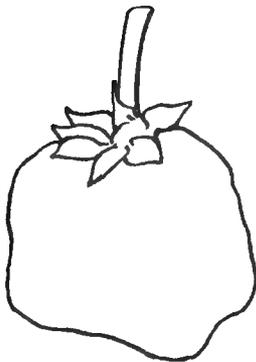
Sir Charles Napier



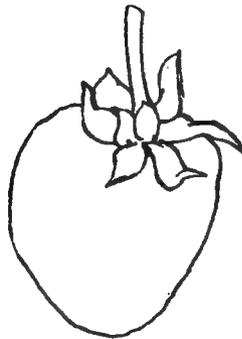
Sir Joseph Paxton



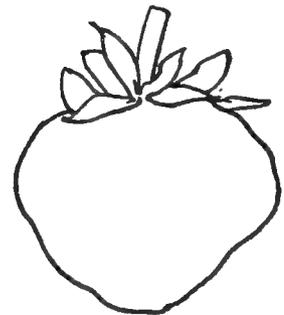
Sir Joseph Paxton



Vicomtesse Héricart de Thury

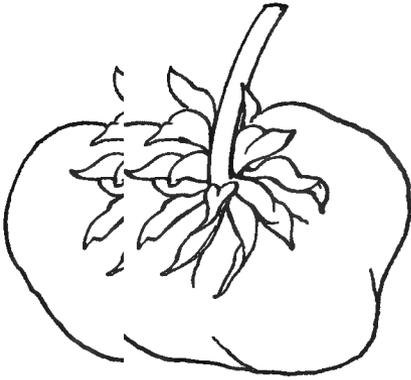


Vicomtesse Héricart de Thury



Trollope's Victoria

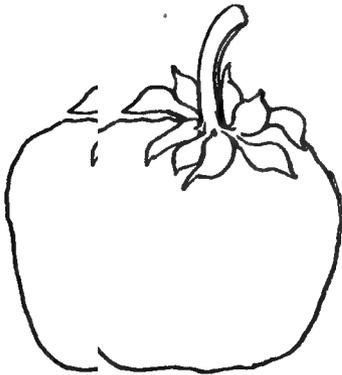
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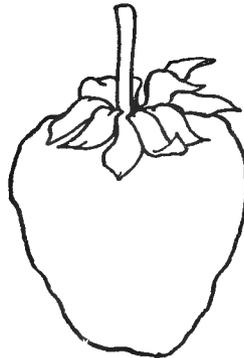
Waterloo



Waterloo



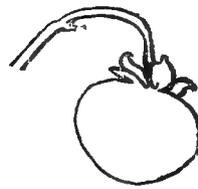
Walluff



Walluff

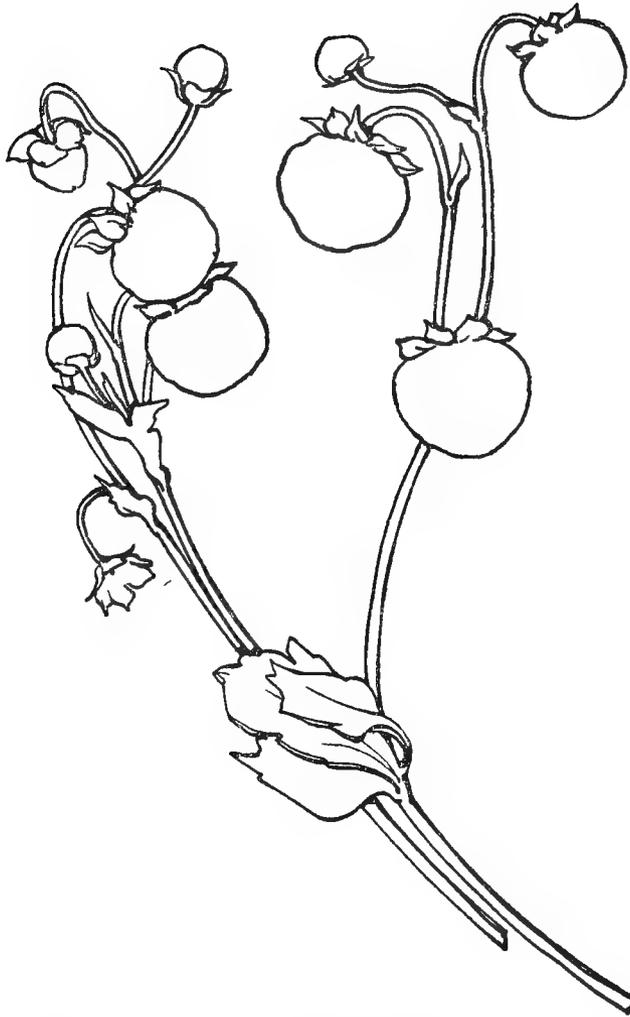


Hautbois



Hautbois

STRAWBERRIES



Alpine Strawberries

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