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PRACTICAL TREATISE
ON THE MANAGEMENT OF
FRUIT TREES;
WITH
DESCRIPTIVE LISTS
OF THE MOST VALUABLE
FRUITS FOR GENERAL CULTIVATION;
ADAPTED TO THE
INTERIOR OF NEW ENGLAND.
BY GEORGE JAKUES.

Every Clymat hath its owne fruit, far different from that of other countries. GERARDE, in 1597.

Those fruits which succeed perfectly in one section of the country, are sometimes ill adapted to another.

DOWNING, in 1845.

WORCESTER:
ERASTUS N. TUCKER.
1849.

Frank Jacques

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INTERIOR OF NEW ENGLAND.

BY GEORGE J. LARSEN.

WORCESTER:

BENJ. J. DODGE, PRINTER, PALLADIUM OFFICE.

1849

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PREFACE.

HAVING waited a long while, in the hope that some one better qualified for the work, might be induced to furnish the fruit-cultivators of Interior New England with a treatise such as their *local* wants demand, I have at length ventured upon the undertaking myself.

A book of this kind is so greatly needed, to guide the operations of a large and increasing class of our citizens that even comparative incompetency may not have labored upon it in vain.

If there are pears which ripen finely at Salem, but will not succeed in Boston; if the climates of Western New York and the shores of the Hudson differ so widely, as to affect the quality of several varieties of different species of fruits, one might easily infer—that what it has cost the writer something to learn—that whoever would succeed with fruit-trees, in the hill-country of the eastern states, may rely with tolerable safety upon the uncertain testimony of his own neighborhood, while the profoundest wisdom that has ever recorded the experience of other countries, would only mislead and bewilder.

I have endeavored to make my book what its title indicates. My Lists of Fruits have been carefully prepar-

ed, in honesty and in truth, and not with the mean selfishness that would thus advertise the worthless trash of a worn-out nursery. Should this little work in any instance disappoint expectation, I shall deeply regret, that the best intentions have failed *here* through inability, while, *elsewhere*, those better qualified to instruct have sometimes written with other prayers than for the success of their disciples.

My sources of information have been,—

1. *Nearly eight years experience* in the cultivation of nursery and orchard trees, chiefly by the labor of my own hands.

2. *A close observation* of the management of nurseries and orchards, in this vicinity and in other places, for the last ten years.

3. *A careful inspection of the very instructive Exhibitions of the Worcester Co. Horticultural Society*, from its formation to the present time.

4. *Personal interviews and correspondence* with several of the most distinguished horticulturists in this section of the country.

5. *An attentive perusal* of almost all the agricultural and horticultural publications that have been issued, particularly in the northern and eastern states, during the last twelve years.

G. J.

Worcester, March, 1849.

INTRODUCTION.

"But forward in the name of God, graffe, set, plant and nourish up trees in every corner of your grounds, the labour is small, the cost is nothing, the commoditie is great, yourselves shall have plenty, the poore shall have somewhat in time of want to relieve their necessitie, and God shall reward your good mindes and diligence."

So wrote the enthusiastic Gerarde, two hundred and fifty years ago, and surely no better advice can be given to the land-owners of New England at the present time. For, when it is taken into consideration, that the soil and climate of this section of the country are most admirably adapted to orchard cultivation, that the New England apples are among the finest flavored of any grown in the world, that the home market for fruit never has been, and that the foreign market probably never can be supplied, one must admit that nothing is apparently more feasible, than to make the lands of Worcester county and other sections of the eastern states far more valuable than the most productive wheat-fields of the west, or the richest cotton-grounds of the south, so that the ruddy-cheeked *Baldwin* apple and the *d'Arenberg* pear may take their easily attainable rank among our chief articles of exportation.

While, therefore, so many mills compel each little rivulet to

earn and re-earn its passage to the ocean ; and while that ocean continues to bear our surplus wealth to every distant clime, let no planter of an orchard anticipate a want of purchasers for whatever fruits he may wish to spare from his trees. And even upon a smaller scale, the farmer who consults economy or regards the happiness of his family, will never regret the labor which can so easily spread upon his table an abundance of the various fruits of the successive seasons.

There is a pleasure too in these pursuits, from which unlike all other earthly pleasures its votaries never turn aside with satiety or disgust. Our most endearing associations, our most refined perceptions of the beautiful, are connected with fruit and other gardens. Horticulture, says Sir Wm. Temple, has been the inclination of kings, and the choice of philosophers. The Prince de Ligne after sixty years' experience, affirms that the love of gardens is the only passion which augments with age.

Something also may be urged in favor of the moral tendency of the occupation, since as the latter writer finely observes, " it seems impossible that a wicked man should possess a taste for it."*

There are those who will say—"all this reads pretty well ; yet we ourselves are too old to reap the profits, to learn the pleasures, or to experience the moral influences of which you speak." "Too old?" Why, with proper selection and careful cultivation, your trees will render you valuable returns in even less than six years from the time you put them out.

Says J. J. Thomas, "A Bartlett pear-tree, six feet high, and two years from transplanting, bore a peck of superb fruit. An apple tree, removed to the orchard when not larger than a car-

* Il me semble qu'il est impossible qu'un méchant puisse l'avoir.

riage-whip, produced a bushel the fifth year." We have ourself a Hubbardston Nonesuch apple-tree which, in the third year from the nursery and the tenth from the seed, bore us a half bushel of splendid fruit; and the next year it produced nearly a bushel. Peaches, plums, and cherries begin to show fruit the second year from the nursery, and frequently the former two produce large crops in less than five years.

"Too old!" Rather say too lucky, that your father did not make the same plea, when planting the trees of which you first eat in childhood.

"Too old!" Admit it,—must we also understand then that you are also *too mean* to pay to posterity what you owe to those who have gone before you? Selfish man! Plant trees, plant trees. No matter whether or not you may eat thereof yourself. The fruit will afford another just as much pleasure as it would you. Plant trees—"forward in the name of God," plant trees, and it shall cheer the useless hours of old age to remember, that in your day and generation you did something, even so little, to leave the world better, or at least no worse, than you found it.

The subject-matter upon which this little work is designed to treat, seems to us worthy the attention of all land-owners who look to pecuniary profit, healthful recreation, and favorable moral influences, or who feel disposed to leave to posterity something of as goodly a heritage as former generations may have bequeathed to them.

But the limits of a work, practical as this purports to be, do not admit of further reflections of this kind. Let us proceed at once to those enquiries which may serve to direct the hand of future labor.

"Allons mes amis, il faut cultiver nos fruitiers!"

vineyard, produced a bushel the fifth year." We have our
 with a Heilmann's Heilmann apple-tree which in the third
 year from the nursery and the fourth from the seed, bore us
 a full bushel of splendid fruit; and the next year it produced
 nearly a bushel. Peach, plums, and cherries began to show
 fruit the second year from the nursery, and frequently the fol-
 lowing year two produce large crops in less than five years.

"Too old!" Rather say too lucky, that your father did not
 make the same plan, when planting the trees of which you first
 eat in childhood.

"Too old!" Admit it,—must we also understand then that you
 are also too much to pay to posterity what you owe to those who
 have gone before you? Selfish man! Plant trees, plant trees,
 No matter whether or not you may eat thereof yourself. The
 fruit will afford another just as much pleasure as it would you.
 Plant trees—"forward in the name of God" plant trees, and
 shall cheer the weary hours of old people, and in
 your day and generation you did something, even so little to
 leave the world better, or at least no worse, than you found it.

The object-matter upon which this little work is designed to
 rest, seems to us worthy the attention of all land-owners who
 look to pecuniary profit, hostile to recreation, and favorable to
 industry, or who feel disposed to leave to posterity some-
 thing of as good a heritage as former generations may have be-
 queathed to them.

But the limits of a work, practical as this appears to be, do
 not admit of further reflections of this kind. Let us proceed at
 once to those inquiries which may serve to direct the hand of
 future labor.

PART I.

OF THE GENERAL CULTIVATION OF
FRUIT TREES.

PART I.

OF THE GENERAL CULTIVATION OF
FRUIT TREES

CHAPTER I.

PRODUCTION OF A NEW VARIETY OF FRUIT.

Of the vegetable no less than of the animal kingdom, it is a law to which there are few exceptions, that, in their native wilds uncontrolled by man, the different species exactly reproduce themselves.

The process of change commences with the generations raised in a domesticated state.

Some plants, indeed, and animals also seem not to be susceptible of the ameliorating influences of human care. But almost all the really useful species are easily brought into a state of domestication. When once the artificial treatment of culture is applied, the artificial product of varieties is the result. The seeds, for example, of the common field-strawberry, sown in the garden, will produce fruit differing from that of the parent-plant and also from each other. The product from sowing the seeds of these will be still more

varied, and so on with each successive cultivated generation.

And not only does cultivation originate but it sustains our fine varieties of fruit; for experience has rendered it highly probable that, but for the fostering hand of man, these would, in the course of a few generations, rapidly degenerate into a comparatively limited number of wild fruits.

And here we will digress a moment to state a truth which lies among the foundations of horticultural science—that it is as absurd for a man to talk of the *natural* treatment of a garden fruit-tree, as of the natural treatment of his artificial Durham cow or of his own yet more artificial self; for a fine fruit-tree is the combined product of nature and art, and nature and art must both take care of it, or it dies.

We shall not attempt to explain *why* the effect of cultivation should be to produce varieties. Perhaps the tendency to accidental hybridization is thereby greatly increased. Perhaps the influences of grafting, being almost always combined with those of cultivation, may be to break up the natural course of re-

production. Certain it is, and sufficient for our purpose, that the fact exists.

All varieties of plants and fruits, good or bad, originate from the seed.

There are two distinct modes of producing them in use among cultivators—1st, by sowing *selected* seeds; 2d, by sowing *hybridized* seeds.

SECTION I.

SOWING SELECTED SEEDS.

THE laws regulating this mode of reproduction are not well understood. Of a thousand apple-trees raised from seeds of some fine variety—say the Baldwin—and grown to a fruit-bearing age, probably not one would show a fruit equal to the original ; and while the number of varieties thus produced might equal the whole number of the trees, perhaps not three out of the whole would be found worthy of cultivation. Some of the trees would bear small fruit, others large ; some fair, some knurly ; some sweet, others subacid, sour or bitter ; some would ripen their fruit early, others would retain theirs until the frosts and winds of Autumn should scatter them upon the ground. Little therefore can be hoped from this chance sowing of selected seeds. Other circumstances must govern the choice of seeds, beside the mere qualities of the fruit from which they may be taken.

Professor Van Mons, after devoting nearly his whole life to these pursuits, came to results which may be briefly stated as follows :

THEORY OF VAN MONS.

The design of nature is to produce a healthy plant capable of furnishing seeds for continuing the species.

The object of cultivation (or rather domestication,) is to turn the energies of nature from this end to the enlargement of the size and improvement of the flavor of the fruit containing the seeds,—that is, so far as the vigor and robust health of the tree is affected, it is an *enfeebling* process.

To carry forward this enfeebling work, select your seeds from a *young* tree of a *garden*, not a wild variety, gathering the fruit *before it is fully ripe*, and suffering the seeds to remain in it *until it is decayed*. The words just italicised indicate four sources of enervating the breed, (if this latter term is allowable.)

The trees from these seeds should be *root-pruned* and *branch-pruned*, on purpose to enfeeble and stunt their growth ; and, in order

that there should be no contamination from other breeds, they should be allowed to bear their fruit upon their own roots.

From these trees select seeds as before, plant, prune and re-select seeds, and so on, until in about the fifth generation for pears, the fourth for apples, and the third or second for stone fruits and other shorter lived species; the seedlings will nearly all become of great excellence. The point of perfection once attained, a further continuance of the process will result in a retrograde movement toward the original wild state of the plant.

This theory seems to be founded in reason, although facts stubborn and numerous exist in opposition to it. Indeed, the principles which govern the reproduction of plants from the seed, are still very imperfectly understood.

It will easily occur to the reader, that accidental causes have placed within reach of the American cultivator abundant materials in all stages of progress for the mode of reproduction which originated with Van Mons.

We come now to the far more certain, direct and scientific mode of originating fruits.

SECTION II.

SOWING HYBRIDIZED SEEDS.

HYBRIDIZED seeds are those contained in fruits which have been originated, by fertilizing the stigma of the flower of one tree with the pollen of another of different though nearly allied characters; for, like grafting, the process cannot be extended beyond certain comparatively narrow limits. A fruit produced by this cross fecundation, usually possesses properties intermediate between those of its parents; and the seedlings from such a fruit, although they may slightly differ among themselves, will all bear fruits partaking of the mixed characters of the fruits of the two parent trees.

Strictly speaking, a *hybrid* or mule plant or fruit is the product of two *different* though nearly allied species; a *cross-bred* plant or fruit is a sub-variety originating from two varieties of the *same* species.

We have said that the field of hybridizing,

like that of grafting, is hemmed in by narrow limits.

Indeed the laws of hybridizing in the vegetable and in the animal world are similar, though less stringent in the former than in the latter. We must therefore expect to find the seeds of *cross-bred* plants sometimes sterile, and those of mules or *hybrid* plants almost always so, or becoming so in the second or third generations. And therefore our two distinct modes of producing seedlings cannot be combined to any great extent, even were it desirable.

This art of hybridizing has scarcely been known above half a century, and its utility is as yet probably not at all appreciated as it will be hereafter.

Some of the results which have been and may be produced, are—among *Flowers*, greater hardihood, change of time of flowering, improved odors, increased size, more beautiful colors, &c.—among *Fruits*, and *Vegetables*, almost every desirable improvement of size, flavor, time of ripening, productiveness, &c.—among *Timber-trees*, more rapid and larger growth, superior toughness and strength, compactness, &c.

In conclusion, we may say that the business of producing new varieties of fruits, as well as of improved breeds of animals, should be required at the hands of men of wealth and leisure, and ought hardly to be attempted by persons of humble means and limited resources. But better still, were a part of the revenue of a state or a nation judiciously and wisely expended in this way, the results would richly repay the outlay.

CHAPTER II.

MULTIPLICATION OF A VARIETY.

ONCE in possession of a fine variety of fruit, a benevolent man would be anxious to know how its existence might be perpetuated, and the number of trees of it indefinitely multiplied. Indeed, without any very urgent promptings of benevolence, the fortunate recipient, in Pomona's lottery, of such a prize as the *Esopus Spitzenburg* apple, the *Paradise d'Automne* pear, or the like, might naturally enough be solicitous to increase the number of trees of it, as rapidly as possible. Since these objects cannot be obtained by sowing the seeds of the fruit, as we have already stated, we must resort to the only two other methods left us,—1st, That of dividing the original tree; 2d, That of grafting buds or scions from the original into other trees.

SECTION I.

DIRECT MODE OF MULTIPLYING, BY DIVIDING THE ORIGINAL TREE.

THERE are two specifically different modes of accomplishing this. The first mode is by Suckers; the second, by Cuttings and Layers.

I. SUCKERS.

A *sucker* is a portion of a tree growing up from the root or from a portion of the trunk which is below the surface of the soil. By digging down carefully and cutting it off with a portion of the root attached, and setting it out at the proper season of transplanting, it will become a tree of itself. It will not, however, possess so thrifty and vigorous a habit as that of its parent,—although suckers sometimes do make very handsome trees. Another objection to suckers is, that they have a strong disposition to waste their energies in generating other suckers. Still a third objec-

tion lies in the fact that they are very apt to retain whatever diseases or infirmities infect the tree from which they may be taken. Whether therefore for fruit-bearing purposes or as stocks for grafting, they are in general by no means especial favorites with the careful and judicious cultivator. Exceptions must, however, be made in favor of the Vine, the Quince, and a very few other fruit-bearing plants, which will be noticed in their proper place.

II. CUTTINGS AND LAYERS.

A *cutting* is a bud, or a twig (containing two or more buds) of the previous season's growth, cut from a tree. This being planted, if a twig, partly, and, if a bud, wholly under ground, will, under favorable circumstances, take root and itself become a tree.

It is possible with proper care to multiply all fruit trees and shrubs in this way. But, practically, this mode is chiefly confined to the Vine, the Quince, the Currant, the Gooseberry, and a very few others.

Twig-cuttings should be cut and set early in the Spring. They should be separated from the tree at the point between the last and

the previous season's growth; the tip end should be cut off so as to leave them from eight to fourteen inches long. When planted, from two-thirds to three-fourths of their length should be under ground, and the soil should be pressed hard about the lower end. *Mulching*, or covering the ground with straw so as nearly to hide them from sight, is an excellent mode of assisting nature in this work. Planting also in a shady place answers a similar purpose.

When it is desirable that the cutting should make a tree-like growth without throwing up suckers, all the eyes in the part put below the surface of the ground should be cut out.

Bud-cuttings, or those containing but a single eye or bud, should be planted about an inch deep in the ground at the same time with twig-cuttings. The Chinese *Multicaulis* and some varieties of foreign Grapes are raised in this way. In propagating by cuttings, the chances of success are greatly increased by the application of underground heat. This mode is much practiced with plant cuttings in green-houses.

It should be understood, however, that a strict compliance with these rules is not

always necessary; for cuttings often succeed when cut and planted in the most careless manner. For instance, with herbaceous cuttings, an unskilful hand at the hoe in a cloudy day, will in this way propagate some kinds of weeds to a most undesirable extent, doubling and trebling their number where his only intention was to destroy them.

A *layer* is a cutting which has been prepared one or more seasons previously to being used. A twig growing out of a tree at a point not far from the ground, is bent down and the middle portion of it is buried just under the surface of the soil and fastened there by means of a hooked peg or by a stone or turf placed above it. Success is rendered more certain by checking the downward flow of the sap. This may be accomplished by cutting a slice off the under side of the part of the twig that is placed under ground, or, more imperfectly, by twisting, bruising, or partially debarking the twig at that point; some recommend to enter the knife on the under side at this point and split the twig upward about one or two inches, fastening the split open with a little wedge or pebble.

Trees or shrubs purposely headed down

for raising layers, are called *stools*. A single quince-bush, thus made into a *stool*, and its twigs layered, is capable of producing many finely rooted plants in a single season. Of some kinds of layers, nearly every bud will form roots of its own. A tree or shrub originated from a layer, has a tendency to a dwarfish habit, and to inherit the diseases by which its parent-plant may be affected.

SECTION II.

INDIRECT MODE OF MULTIPLYING, BY GRAFTING FROM THE ORIGINAL INTO OTHER TREES.

A *graft* is either a *scion* (which is the same thing as a twig-cutting,) or a *bud* (which is the same thing as a bud-cutting.)

Grafting consists in causing a scion or a bud to grow upon a limb or the trunk of a tree, instead of taking root directly in the ground. The artificial tree thus produced, is said to be a *worked*, or more properly a *grafted* tree. A defect in the language compels us to use the term *graft* and its derivatives, in a specific as well as a generic sense. Thus to graft means, commonly and specifically, *to scion*; generically it means either *to scion* or *to bud*.* Were it our province to show how words instead of trees may be multiplied, we should be tempted to enrich the phraseology of horticulture, by endeavoring to introduce into good usage the

* The French employ the word *greffe* (graft) in this same generic sense, as a term including both grafting and budding.

word *to scion* and its derivatives, *scioning* and *scioned*, just as we have *to bud*, *budding*, and *budded*.

The tree upon which a graft is set, is called a *stock*. The stock and the graft (scion or bud) form a partnership, the former discharging the duties of mouth and stomach, by means of its roots, the latter performing the functions of lungs and perspiratory system, by means of its leaves.

It hardly needs to be explained that no grafting can succeed, unless the sap vessels of the graft (scion or bud) and those of the stock, are so adapted to each other that the flow of sap shall pass uninterruptedly from one to the other. These sap-vessels are chiefly situated in the inner bark (or liber) of trees.

Neither can any grafting, however nicely performed, be successful, unless between different varieties of the same species, as the Apple upon a seedling apple-tree stock; or between nearly allied species of the same genus, as between the Apple and the Pear, which unions are comparatively imperfect and short-lived; or, thirdly, between nearly allied genera, as between the Cherry and the Plum, which maintain a feeble existence for a limi-

ted period, and then die. All unions, therefore, between widely different genera and species, are utterly impossible, as the graft cannot live upon the sap supplied by the stock, any more than a lion can be fed upon grass. Virgil, and other writers of antiquity, being ignorant of this principle, were led into great errors—a warning to those of modern times, who publish dreams of imagination instead of real facts.

The practical limits within which grafting is ordinarily confined, are, first, between varieties of the same species, for standards; and secondly, between varieties of different species or genera, for dwarfs. The Apple upon an Apple-seedling, is an example of the first, the Apple upon the Pear, and the Pear upon the Quince, are examples of the second. Other things equal, grafting is successful in proportion to the health and vigor of the stock upon which it is performed. Recently transplanted trees, therefore, are not in a favorable situation to be grafted, although they often are grafted successfully.

The primary object of grafting has already been stated. Among the secondary uses of this curious and very ancient art are,—

1st. To alter the head of a tree bearing one kind of fruit, so that it shall bear another fruit possessing more desirable qualities.

2d. To improve the form of a tree, by inserting scions or buds into the sides of the trunk or limbs.

3d. To invigorate a feebly growing variety, by grafting it upon a vigorous stock.

4th. To accumulate a number of varieties upon a single tree.

5th. To accelerate the fruiting of a young seedling tree, by setting grafts, or, more especially, fruit-spurs or fruit-buds from it, upon a grown tree.

6th. To propagate a tree in soils unfavorable to its own roots; as, for example, the Peach upon the Plum, in cold clayey soils.

7th. To save a variety from being lost, as when accident has destroyed the original tree.

8th. To transmit a variety through channels in which it would be impossible to send a whole tree, as to forward a scion or a bud enclosed in a letter.

9th. To produce dwarf-trees. For this, the Apple is grafted upon Paradise (or Doucin) stocks, the Pear upon the Quince, Thorn or Mountain Ash; the Peach upon the Plum,

the Plum upon Mirabelle Plum seedlings, the Cherry upon the Cerasus Mahaleb, and, in general, any tree upon any other kindred tree of slower or smaller growth. There is also, we may remark here, another mode of producing dwarf-trees, by root-pruning, which we shall describe under the head of *Pruning*.

The stock and the graft (scion or bud,) exert influences upon each other, mutually. Some of the influences of the stock have just been mentioned, see 3d, 5th, 6th, and 9th uses of grafting above described. The stock often affects the size and flavor of the fruit borne by the graft. Thus the Saint Michael pear is larger, fairer, and better flavored, in our climate, when grown upon the Quince stock. Of a graft or a stock, either may communicate its own diseases and infirmities to the other. It is pretty well established, also, that stocks bearing early fruits, have an influence in accelerating the ripening of the fruits which may be made to grow upon them by grafting. The graft is also said, in some cases, to affect the appearance of the bark of the stock, and also the form of growth in its roots.

It may be remarked here, that many of the

theories respecting these influences, rest upon a rather sandy foundation of facts.

There are two general methods of Grafting, 1st, with *Scions*, 2d, with *Buds*.

I. SCION-GRAFTING, (*or scioning.*)

As we have said above, a graft, consisting of a twig containing two or more buds, is called a scion. The art of uniting such a graft to a stock, may be called scion-grafting, or, if the term were in use, we should prefer to call it *scioning*.

It is a general rule that scions succeed much better, when they have been cut some time previously to their being set. The best time to cut them, is from the middle of January to the last of February, although they *may* be taken from the trees, at any time from late autumn until spring. In order to keep scions until they may be used, nothing more is necessary than to thrust their lower ends into the ground, in a shady place, say close on the north side of the trunk of the tree from which they were cut; or a better way is to set them half their length deep, in a box of fine soil in a cellar. Scions of stone-fruits require to be kept with more care than those of the apple

and pear. Scions are often set immediately on being cut, in the months of March and April.

In cutting scions, we take, from the extremity of the limb of a tree, that part of it which grew the preceding season, and we keep the shoot or twig entire, till wanted for use. Any thing of this description will answer for scions, but the best scions are cut from the upright topmost limbs of the central parts of a healthy tree. Young nursery trees often furnish excellent scions. Grafts of unhealthy trees ought always to be avoided.

In all the modes of grafting, it is necessary to protect the joint of the stock and graft from the weather, till the two have grown together. For this purpose, in scion-grafting, two compositions are used, one is called *grafting-clay*, the other, *grafting-wax*.

Good *grafting-clay* is made, by mixing two parts of clay with one part of fresh horse dung, adding a little hair as in mortar. It should be prepared some days before using, and the more it is worked over the better. *Grafting-wax* is composed of bees-wax, rosin and tallow. Downing recommends three parts of bees-wax, three parts of rosin, and two

of tallow. Melt them well together, and pour the mixture off into a vessel of cold water. Before it hardens, work it over with the hands, as you would molasses candy; and, as with the clay, the more it is worked over the better. Among the Dutch, a compound of equal parts of cow-dung and loam, well worked together, is used in preference to any other.

T. G. Yeomans, of Walworth, N. Y., recommends the following, as a grafting-wax which "will give entire satisfaction to whoever shall use it." He says he considers it better, as well as cheaper, than any other grafting composition known. Mr. Yeomans prepares what he calls his "*superior grafting wax*," by mixing together 1 pint Linseed Oil, 1 pound Bees-wax, and 6 pounds Rosin. He does not inform us how the mixing process is conducted, but we presume the rosin and bees-wax are simmered together, over a fire, and the oil added afterward. Any of these compositions will answer a very good purpose. Even a turf of grass has served to protect a cleft-grafted scion, sufficiently to ensure its success. But it is never advisable to attempt grafting, unless one has good tools, time, and patience to do the work faithfully

and well. When it is desirable to bestow the greatest possible care upon a scion, the wax composition and also the tip end of the scion may be covered, in addition, with the gum-shellac composition, which we shall describe under the head of *Pruning*.

Scion-grafting may be performed at almost any season of the year, with scions properly kept. A stick of buds (see Bud-Grafting,) may be inserted on the north side of a tree, at budding time, after the mode of side-grafting explained below; and from that time to the first of June, scions *may* be successfully set. But by far the best time to graft with scions, is from the middle of February, in mild weather, all along until the middle of May,—stone-fruits first, and other fruits chiefly in April and May.

Scions are united to their stocks in several ways. Whatever may be the mode of operating, the principle is always the same as above stated,—namely, *the sap-vessels of the graft and the stock must be so adapted to each other, that the sap can flow uninterruptedly from the one to the other.*

Cleft-grafting, so called, is the mode of scion-grafting in most common use. Stocks, from

half an inch to two inches in diameter, are usually worked over in this way. The whole top of a large tree may thus be headed back and grafted, so as to become even more valuable than one that was grafted in the nursery. The operation is easily described. Saw off the stock crosswise; then pare the end smoothly with a knife. Next, split it down about two inches, with a thin sharp knife, driven with a hammer. A narrow wedge is now driven into the middle of the cleft, so as to keep the top of it open about a quarter of an inch. Cut the scion, (which should not contain more than three or four buds,) at the lower end, in the form of a wedge, about one and a half inches long, contriving to have a bud* or eye at the top of the part so formed, to ensure greater success. The scion is next to be inserted on one side of the stock, and fitted nicely into the cleft, so that the inner bark of the outer side of the scion shall exactly meet that of the stock. On large stocks, two scions are thus inserted, one on each side; and, when a stock is extremely large, two clefts may be made, and four scions inserted. These will be

* After the scion is set, this bud should be on the outer side of it, and about a quarter of an inch below the top of the stock.

managed, in future years, according to the discretion of the pruner. When the stock is very small, it is necessary to bind the joint, by tying it with bass-matting. Every part of the joint should now be protected from the weather, by covering it with grafting clay or wax. When the scion is set just at the surface of the ground, a little mound of earth may be heaped over the joint, as a substitute for the clay or wax.

When the stock and scion are of about the same size, the operation may be reversed, the cleft being made in the scion, and the stock wedge-shaped and fitted into it. This mode is called *saddle-grafting*. A little wood should be pared out, on each inner side of the cleft of the scion, so as to fit it better to the stock.

Splice-grafting. This is done very neatly and perfectly, upon stocks which are of the exact size of the scion. Cut off the stock, with an upward slant of an inch or more in length, and the scion with a similar downward slant; tie the two firmly together with bass-matting, always fitting their inner barks, or sap-vessels, to each other; next, cover the joint with wax or clay, and you have performed one of the

neatest and surest modes of grafting yet known.

When the stock is larger than the scion, the latter must be fitted to one side of the former.

It is often more convenient in practice, to *tongue* the stock and scion together, that is, to cut a corresponding notch or slit in each, and then fit the two carefully together, tying and claying or waxing the joint, as before.

Small stocks, taken up in the fall and kept in a cellar, are often grafted in winter, by the fire-side, in either of the above-described modes, and then kept in the cellar until spring.

Side-grafting is often practised to improve the form of a tree, or as a substitute for the other modes of grafting. Cut the scion as for splice-grafting. In the bark of the trunk or limb, where you wish to insert the scion, cut a slit, of the form of an inverted L (thus Γ), paring away a small triangular piece of the bark, on the upper side of the horizontal part of the slit, so that the scion may fit closely to the stock. The vertical part of the slit should be two or three inches long. Raise the corner of the bark, and enter the scion under it, always remembering the fundamental princi-

ple essential to the success of all grafting. By shaving off the bark of the scion entirely around its lower end, more of its sap-vessels are brought in contact with those of the stock, and its growth is therefore rendered more certain. The joint must now be bound with strong matting, or tarred rope (old ship-rigging.) In applying the bandage, it should be wound, so as to bind the scion against the undisturbed bark of the vertical portion of the slit. Cover with the composition as before. Fruit-bearing spurs of the Pear or Apple, inserted in this way, sometimes bear the same season in which they are grafted.

This mode of grafting cannot be performed, until the sap of the tree flows freely, say about the tenth of May, or later for most kinds of trees.

In-arch grafting. This mode is used when others will scarcely succeed. The two trees must stand close to each other. A twig of each, without being cut from its tree, must be pared with a long corresponding slanting cut, and the two raw edges must be fitted nicely, and bound firmly together, and the joint covered with the composition. When the union has taken place, the trees are so separated, as to

leave the scion on the tree where it is wanted.

There is also a mode of grafting, by which a stock may be worked into a tree which has a feeble root. Take, for instance, a pear-tree upon a quince root, which has become weak and unhealthy, at or below the point of grafting. Set out, close to it, one or more small vigorous Pear stocks, and graft them into the trunk of the Pear, as near the surface of the ground as possible, or even below it, by the mode of *side-grafting* inverted. We have seen a dwarf thus entirely taken off its quince bottom, and converted into a standard tree. This should be done as early in the spring as the bark will slip.

In rich soils and favorable locations, the Pear may be taken off its Quince bottom, simply by setting the latter three or four inches under ground, or by raising the ground around it, using, in the latter case, a rich, generous soil, suited to the wants of Pear roots.

The sap-vessels of the Grape, and of some other vines, are of such structure and location, that the mode of grafting may be varied essentially from what has been described above.

Mr. Goodnow, of Indiana says, "I have

never succeeded with any other mode of grafting the Grape than this:—Cut off the root, some two inches below the ground, with a transverse cut. Then choose a gimblet just the size of the scions to be inserted, and bore from one to three or four holes, in the end of the stock, according to the size of the root, and insert the scions, first removing their loose bark. The holes should be two or three inches in depth, and perpendicular with the grain of the wood, and the scions should fit accurately into them. I have never known them fail to grow. If the operation is performed so late in the spring that the root shows a disposition to bleed, grafting cement must be used.” We infer, therefore, that this work would be done more advantageously, very early in the spring.

Herbaceous grafting, (or rather scioning.) The French gardeners have succeeded perfectly with this curious operation; grafting melon vines upon those of the cucumber, the tomato upon the potato, and effecting other similar unions between vegetables of the same species.

II. BUD-GRAFTING, (*budding or inoculating.*)

Bud-grafting, which is commonly called *budding* or *inoculating*, is a modification of side grafting, in which the graft consists of but a single bud, or eye.

This is always an easy and convenient method of working small stocks. It is usually performed, in the latter part of summer, although it *may* be done late in the spring; but it is not advisable to resort to *budding* in the spring, except where we have a very valuable scion, which we wish, by subdividing, to increase the chances of saving. In this case, we may cut off the buds of the scion, and insert them separately, in the manner which we are about to describe, waiting of course till the sap of the stock is in full motion. We, in this latitude, commence budding Plums, Cherries, Apricots and Pears, the latter part of July. From the middle of August to the middle of September, is the season for Apples. From the first to the middle of September, is better than earlier, for Peaches

and Nectarines.* It is essential to success,—
 1st. *That the bark of the stock should part freely from the wood*; for whenever, either from the season of the year or the feeble condition of the stock, the bark adheres to the wood, the operation will certainly prove a failure.
 2d. *The bud which is to be inserted, should be well ripened*; otherwise it will not have vital energy sufficient to establish itself, in its new location.

To prepare a *stick of buds* for budding in summer or autumn, take a scion of the present season's growth, and cut off the portions of each end of it containing buds that are imperfectly developed. Next, cut off the leaves, at a point about in the middle of their stems or *footstalks*. The buds which are to be used, lie in the angle on the upper side of these stems. Upon the Peach and some other trees, three classes of buds will be noticed,—single, double, and triple. Double buds being gener-

* It will give a better idea of the proper time for autumn budding, to mention, that a bud has two stages of growth,—1st, to unite itself with its stock; 2d, to form wood of its own. The best time to set a bud, in summer or autumn, is just early enough to allow it time to complete its first stage of growth, without entering upon its second, this latter growth being delayed until the ensuing spring.

ally fruit-buds, ought to be avoided, unless when the particular object of the operation, (which seldom succeeds,) is to secure a specimen of fruit the ensuing year, and nothing further. Single *wood*-buds are preferable to the triple ones, except in working the Peach, where the latter, in our climate, seem to succeed quite as well as the former. It may assist the inexperienced budder, to inform him that the *blossom*-buds are quite round, whereas the *wood*-buds are always long and pointed. Very feeble wood-buds sometimes have not vigor sufficient to grow into a twig; they, therefore, emit two or three leaves only, the first season, and then die.

The size of the stock (trunk or limb,) upon which this operation is to be performed, ought to be from one-eighth of an inch to not more than an inch in diameter. There are many modes of budding; we shall give only that which we consider the best.

With a sharp budding knife, (a pen-knife will answer,) upon a smooth place, on the side of the stock, cut a longitudinal slit, an inch or more long. Across the top of this, cut a transverse slit, from a quarter to half an inch long, so that both slits, taken together, shall resem-

ble a letter T. Next, cut from your stick of buds, a thin slice of bark, with a little wood in the central portion of it, entering the knife about half or three-fourths of an inch below, and bringing it out about as far above a bud. This slice of bark and wood, taken together, is called a *bud*,—the part of the bud which grows into a twig being technically called its *eye*.

With the ivory haft of your budding-knife, or, if you have not such a knife, with any little wedge of wood or ivory, raise up the corners of the slit in the stock. Taking hold of the bud by its foot-stalk, enter it, and gently push it down to the bottom of the incision. The eye of the bud will now be about from one-fourth to three-fourths of an inch from the transverse part of the slit. The part of the bud, if any, projecting above this transverse slit, should be cut off, by passing the knife through it, into the transverse slit again, so that the upper end of the bud and this transverse part of the slit shall make a good joint together. Bind the bud firmly with shreds of bass-matting, so as to cover every part of it except the eye. Woollen yarn or corn husks will answer, when no matting is at hand.

If the stock grows so much, the remainder of the season, as to occasion the bandage to girdle it, take the bandage off; otherwise, let it remain on until spring.

In the month of April, when the buds begin to swell, remove the bandage, if it has not been previously removed, and cut off the stock three or four inches above the bud, which will soon begin to grow vigorously. The stock is left thus long above the bud, as this will often be convenient for tying up the young shoot of the bud, during the first season of its growth; after which the stock may be cut off close above the point where the bud was inserted.

When the buds are set in the spring, the stocks are cut off above them, as soon as they show any signs of growing. As soon as a bud or a scion begins to grow, all sprouts or suckers (called robber-shoots,) starting out below it, should be carefully cut off. This, however, should be done gradually, if the stock is quite large, otherwise the bud or scion might not afford a sufficient supply of leaves to keep the sap of the stock in healthy action.

A modification of the process of budding is deserving of notice. The French call it *Bud-*

ding without Buds (Greffé sans yeux.) The object of this operation is merely to cover a wound or blemish in one tree with the live bark of another, thus :

“Take from a tree of the same species as the wounded tree, a piece of bark rather larger than the wound, and form it into a regular shape. Cut the bark round the wound into the exact form and dimensions of the piece to be inserted, so that the latter may be fitted into the former, with the greatest exactness. Bind the joint tightly with a ligature, and cover the whole with grafting clay or wax.”

The same cure may also be effected by means of scions. Cut good thrifty scions from the same species of tree as the wounded one. After paring the edges of the wound smoothly, insert the lower ends of the scions under the bark at the lower side of the wound, by the above-described mode of side-grafting; then insert the upper ends of the scions under the bark of the upper side of the wound, by the mode of side-grafting inverted. Bind the joint, particularly at its two ends, with tarred rope or some other suitable ligature. Next cover all the parts heavily with grafting clay; and then bind an old cloth or piece of matting around, so as to secure the whole.

In both the above-described processes of cure, the bandages need not be removed till the next year. Injuries done to trees by mice in the winter, may often be successfully repaired by either of the modes just described.

III. POSITION OF THE GRAFT UPON THE STOCK.

There are five principal points at which a graft may be inserted into a stock,—

1st. *At or below the surface of the ground.* Splice, cleft, and saddle grafting, are applicable at this point, according to the size of the stock, or the fancy of the operator. Trees worked in this way, have a neat appearance, as the joint of the stock and the scion is not visible.

2d. *Between the surface of the ground and the point of branching out.* All the modes of grafting may be practised at this point. But if the stock and graft do not grow alike, the tree will suffer in appearance, and perhaps even in its health and vigor. This is the point where nurserymen graft nine-tenths of their trees, *because* the work can be done more expeditiously here, and the tree becomes marketable quite as soon as

when worked at any other point. But it does not follow, therefore, that this is the best point, by any means.

3d. *At the point of branching.* All the modes of grafting may also be performed here; but the objection just stated weighs also, though in a less degree, against this place of inserting the graft. Trees grafted at this point, are, however, quite as valuable to the purchaser as those worked by either of the above described modes.

4th. *Beyond the point of branching, in the limbs.* A tree properly grafted in this way, so that it shall form a handsome top, is unquestionably more valuable than one which has been worked at any lower point; and if such trees are not recommended by nursery-men generally, it *may* be because such high worked trees cannot be got into the market so young, or sold at so good a profit, as others. We do not at all mean to condemn trees grafted in either of the above-mentioned modes, but only to give our *preference* to those of this latter class.

5th. *Still farther from the trunk, in the branches of the limbs.* This is the place to put a new head upon an old tree. An excel-

lent plan for performing this improvement is recommended by Mr. Olmsted, of East Hartford, Ct. He says, "I begin *on the top*, and graft *one-third* each year, taking three years to complete the entire heads of the trees. Grafting the top first, gives the grafts there the best possible chance, while the necessary reduction of the top throws the sap into the remaining side branches, fitting them well for grafting the following year." The lower branches are, in the same way, made ready for the succeeding year.

This is quite a profitable labor to be employed upon a healthy old tree, of which the present fruit is not good. Twenty-eight bushels of apples were gathered by Mr. O., from a single tree, only six years from the time the first scion was set in it in this way.

In general, except where dwarfing is the object, the nearer the point of union, between graft and stock, is to the fruit-bearing parts of the tree, the better; because seedling wood has naturally more hardihood and vigor, than the wood of a bud or scion usually possesses;—this, at any rate, is the teaching of experience, if not of theory.

CHAPTER III.

STOCKS FOR GRAFTING.

It is generally best to raise stocks of all kinds of fruit trees, from seeds. In the cultivation of the apple, the pear, and also of the plum and the cherry, *sucker*-stocks should be carefully avoided, unless no others can be procured.

The general rule, for raising seedlings of all our hardy out-door fruit trees, is to plant their seeds about an inch deep in the ground, in the latter part of summer or in autumn, as soon as the fruits ripen. The seeds of the later varieties of each species, for the most part, succeed the best. But to be more particular :

Apple seedling-stocks may be very easily raised, thus : Take pomace, in autumn, from the cider-press, before fermentation has commenced ; sow the pomace in drills of about four or six inches in width, and about four feet apart, covering it from half an inch to an inch deep. A neater, but altogether unneces-

sary process, is to wash the seeds out of the pomace, before sowing them.

During the next summer, keep the young trees clean of weeds, working between the drills with a horse-plough or cultivator. If the plants spring up very thick, it is good economy to pull up and throw away a portion of them. By the second or third spring, according to the soil and cultivation, about three-fourths of the seedlings will be large enough to be set out in nursery rows; the other one-fourth, or thereabouts, being of a dwarfish or stunted growth, should be thrown away, as worse than worthless.

Those which are to be planted out in the nursery, will be from one-eighth to three-fourths of an inch in diameter, at the surface of the ground. They should be taken up, their tap-roots shortened, and three or four inches of their tops cut off; then they should be set in *straight* rows, one foot apart in the row, the rows being three or four feet apart.

The best soil, in which to sow the seeds or set the young trees of the apple, is a strong deep loam, rather moist than dry—say a soil that would produce a large crop of Indian corn.

Pear stocks *may* be raised from seed, precisely in the mode we have described for Apple seedlings, only let the soil be deeper and richer. But the climate of New England is not well adapted to their growth, and it is not, therefore, advisable to attempt to raise them, so long as the foreign stocks can be so cheaply purchased of importing houses, in Boston or New York.

Cherry stocks are generally raised from seeds of the common Black Mazzard cherry. Gather the fruit, when it is fully ripe, and sow it immediately in drills, covering, &c., precisely as directed for the apple-seedlings. The soil should be a deep, rich sandy loam.

Some wash the seeds from the pulp, before sowing, but, as with the apple, we have found this to be unnecessary. The stones *may* be kept in sand until spring, but we do not advise to do it. When the plants are one year old, under good cultivation, they will be fit to set out in nursery rows. Assort them according to their size, throwing away the quite small ones; cut off their tap-roots and tops, and set them out in the way described for apple-stocks.

Plum-stocks may be had of the importers,

or they may be raised from the seeds of any free growing kinds, in the same way as cherry-stocks, (avoiding the seeds of the damsons, as they are not easily budded.) A rich, heavy, moist soil suits the plum best.

The above-named stocks may be splice-grafted, when first set out in nursery rows; but it is a preferable practice, to bud them, the ensuing summer. In ten days from setting a bud, it will generally be ascertainable whether it will live. If this appears doubtful, another bud may be set in the stock, either above or below the first. If unsuccessful the first year, bud again the next, and even a third year. If still unsuccessful, *scion*-graft the stocks, at the proper season, or throw them away. This throwing away worthless stocks, by the by, is sometimes a very profitable operation.

Peach stones should be gathered, in the season of the fruit, and kept in sand in a cellar, or buried in the ground, until early planting time in the spring. They should then be cracked with a hammer, and planted in rows three or four feet apart, and six inches to a foot apart in the rows. They should be budded the ensuing September. The next spring,

those stocks in which the bud is not alive, should be cut down close to the ground, and only a single shoot suffered to grow, to be budded the following autumn. If there is again a failure in the bud, dig up the stock and throw it away, as worthless. The highest ground in your nursery is the place for peaches and cherries, and they will be truly grateful for a deep, rich, loamy soil.

Quince bushes may be raised from cuttings, which of course do not need grafting. When seedling quinces are desired, sow the seeds in autumn, just as you would those of the apple, and give them the same after treatment. The quince is much more easily raised from cuttings in Europe than in this country. Good, well rooted plants can be had of the importers quite as cheap as they can be raised here. When it is desirable to graft quince cuttings or seedlings, follow the directions given above for the apple, pear, &c.

Stocks for dwarf-trees—as the Paradise apple, Mirabelle plum, *Cerasus Mahaleb* cherry,—or the dwarf-trees themselves, are obtained from the importers, at very reasonable prices.

CHAPTER IV.

TRANSPLANTING.

No branch of tree-cultivation is more imperfectly understood than this. Thousands of fine trees die, the first season after being set, in consequence of the ignorance and inexperience of those who plant them. And many which survive their first summer of suffering, stand for years, hesitating between life and death, which, had they received an extra fifteen minutes' attention, and a shilling's worth of rich soil at setting, would have repaid for both, an hundred fold, in beauty of growth and productiveness.

To do this work perfectly, it would be necessary to take up a tree, with every fibre of its roots entire, and to set it again, so that every root, rootlet, and fibrous root should occupy the same relative position in the ground, that it originally had,—being at the same depth from the surface; and the earth lying as compactly around it as before.

But, as trees are rarely moved without suffering more or less loss or maiming of their roots, it becomes important to understand how to repair this injury.

A tree is a thing of life. It lives and has its being. Its roots constitute its mouths and stomach; its foliage performs the functions of lungs and perspiratory system. If, on removing a tree, you cut away one-half of its mouths, at the same time, of course, destroying an equal portion of its stomach, its powers of perspiration and respiration must also be proportionably checked, or its health, or life even, may be destroyed. Hence, when a period of rainy weather immediately succeeds the setting of a tree, it is almost sure to live; for the dampness of the atmosphere checks the perspiration and respiration of the tree, till its roots in a measure recover what they have suffered from their mutilation and removal. The same thing is also imperfectly accomplished, by watering the top of a tree with a water-pot for several successive nights after being set, or by binding the trunk with moss and straw. A small plant or cutting is put under a bell-glass for this purpose, the confined air checking the perspiration equally as well as a humid or cloudy atmosphere.

The fundamental principle to be generally observed, in transplanting, is to head back the top of the tree, in proportion to the loss of root that it has sustained by being removed. Trees which are impatient of the knife, as the cherry and some others, should be taken up with great care, so as to save as much of the root as possible. Instead of heading in the top of the newly-planted tree, it has been recommended very strongly, to remove every alternate bud from each little limb or scion of the tree, sparing the terminal buds. This mode, it is urged, saves a year's growth of the wood. This disbudding process may be worthy of trial, but, as at present advised, we should still give our decided preference to the shortening method.

Some fruit trees may be moved much more easily than others. Downing arranges them, with reference to this point, in the following order:—Plums, Quinces, Apples, Pears, Peaches, Nectarines, Apricots, and, last and most difficult, Cherries. It is an invariable rule, *that the larger the tree the less the chances of success*. Small trees should always be set, in the spring, in our climate. If necessarily taken up in the fall, *heel them in* for the

winter ; i. e., dig a trench, lay them in slanting, and bury their roots quite deep in the ground, mixing the soil well among them. In the spring, take them up and set them where you wish. Medium-sized trees, say five to ten feet high, may be set equally well, either in the autumn or spring. Trees of large size should be moved, late in autumn, in the winter, or quite early in the spring. Trees of medium and moderately large size, may indeed be set, at any time, from the fall of the leaf in the autumn until the buds begin to expand in the spring, *provided the weather is not freezing, and the ground is not too wet.* In setting trees of medium and large size, if the trunk of the tree is crooked, place the tree so that it shall crook toward the prevailing wind to which it is to be exposed. In almost all places in interior New England, this will be found to be the north-west wind. If the tree is straight and handsome, set it with its longest limbs toward the north. By observing these rules, you will have the satisfaction of seeing your trees growing more and more symmetrical and beautiful every year.

The ancient precept, teaching to set the sides of the tree to the same points of compass

at which they previously stood, is of not the slightest consequence. From a disregard of the rules just given, three-fourths of the old orchard trees, now standing in Massachusetts, are leaning awkwardly over toward the south-east, where they have been turned by our prevailing north-west winds.

Ornamental trees are generally set, at the same season with fruit trees. The evergreen tribe are, however, best planted out, just as their buds begin to swell in the spring. They are also successfully set, in autumn, and also during the last of May and first of June.* If their roots are exposed to dry, out of the ground, they are about certain to die. If the root of an evergreen is much diminished by removal, it will be found advantageous to shorten-in symmetrically its side limbs, but never head off the leading shoots of evergreen trees.

* This last is said to be the best season for removing evergreen trees from a forest into an open exposure.

SECTION I.

TRANSPLANTING TREES OF SMALL SIZE.

SMALL trees, of less than three-fourths of an inch in diameter, are very easily re-set. If you wish to put them in nursery-rows, i. e., to *trench-plant* them, dig a little trench, sufficiently wide to receive their roots without cramping them. Make this trench by a tight line, so that it shall be straight. Cut off the tap-roots of the trees, if they have any, and shape their side-roots as handsomely and evenly as may be convenient; then cut off the top, (or, what *may* answer, pick off the alternate buds,) of the tree, so as to restore its balance of power between root and top. Set the roots at the same depth in the ground that they stood before being removed; carefully spread them out horizontally and straight, and work the soil well among them with the fingers. After they are covered, the ground should be pressed around them with the foot. Nursery-rows should always be set by a tight rope, so

that they may be straight; for a nursery-man who has his trees in crooked rows, deserves to be called a ———, or some worse name.

Deep tillage is essential to the success of cultivating trees. Nursery land ought to be ploughed and subsoiled, to the depth of from a foot to twenty inches, and there is little danger of too highly enriching it. All stones larger than a hen's egg should be picked off. The best nursery land for fruit trees generally, is that which would produce a hundred bushels of Indian Corn to the acre. Subsoil ploughing, although little practised, should be regarded as almost indispensable.

The highest and driest land of a nursery should be occupied with peaches and cherries; then pears; still lower down, apples and plums; and lastly, the quince and grape, which *will bear, though they do not need, a moister soil* than some of the others.

SECTION II.

TRANSPLANTING TREES OF MEDIUM SIZE.

TREES of medium size, say from five to ten feet high, such as are commonly taken from the nursery to the fruit-garden or orchard, are not generally set with sufficient care. There is no more false economy than that which does this work hastily and imperfectly. It were much better not to attempt this labor at all, until one has time and means wherewith to do it well.

1st. *Preparation of a place for setting the tree.* Dig a hole, avoiding the sites of old trees, five to seven feet in diameter, and fifteen to twenty inches deep, placing the sods, if in sward-land, in one heap, the soil in another, and the subsoil in a third. The diameter of the hole ought to be, at least, three times that of the clump of the tree's roots. Holes of this size, and, in deep, rich land, even smaller ones will answer. But, if the planter has patience to dig still wider, and to any

depth less than three feet, he will find himself amply repaid, in the better growth and health of his trees. If holes are dug over twenty inches deep, they may be filled up to that depth with cobble stones, old bones, or even gravel. The rest of the hole should be filled with a mixture of the soil, subsoil, and rich, black loam, or well rotted compost manure, to the height where it is proper to place the tree. With the hand or spade shape the soil for the roots, into the form of a little cone, on which to set the hollow in the centre of the clump of roots. If this is done some weeks, or even months, before setting the tree, it will be all the better.

2d. *Preparing and placing the tree.* If the ground is dry, or if the roots have been much exposed to the air since the tree was taken up, soak the roots and the lower part of the trunk in water, twelve or twenty-four hours. Cut off all bruises and broken ends of roots smoothly with a knife, and shorten-in the longest, so that the clump of roots may have a somewhat circular form. In cutting a root, always enter the knife upon the under side, and bring it out, with a slope, to the upper side, so that the fibres which may shoot out from the edges

of the cut, shall strike downward into the ground, instead of upward, as they would were the cut made as it commonly is. If the tree is quite large, and a considerable quantity of its roots has been lost in removing it, its branches must be shortened back, or the alternate buds thinned sufficiently to restore the balance of power between the parts below and those above the ground, for reasons already explained. This being done, set the tree and gently press it down upon the place designed for it. As there will be a tendency for the tree to settle down in its new location, the planter should aim to have it stand higher, rather than lower than it stood previously to being moved,—remembering that nothing is more fatal to the growth and health of a tree, than to bury its roots *unnaturally* deep in the ground. Trees of medium and large size, set upon a very gentle elevation like a turtle's back, succeed admirably; and so, if a tree should by accident be set rather too high, the ground can be raised a little around it; or, if this be omitted, the roots will easily strike downward, whereas, the roots of a tree too deeply set, cannot shoot upward, except in the very offensive form of suckers.

3d. *Filling up around the tree.* With good, rich soil, fill up under, among, around and above the roots, straightening them out with the fingers, and placing them in a fan-like and natural position,—being very cautious not to leave any, even small, hollow places among them. If the root is one-sided, make the most you can of the weaker part. At this stage of the work, if you have patience, it is an excellent plan to make a circular dam around the edge of the hole, and keep it full of water, for a half hour or more. In setting evergreens, this, by some, is deemed almost indispensable, unless the ground is quite moist. Next, put in a little more earth, pressing it around the tree with the foot. After this, throw on an inch or so of loose earth, and the work is done.

Another mode of filling up around the trees, called *mudding-in*, has proved very successful. Make the circular dam around the tree first, or, as soon as it is needed, then let one person slowly sift the soil into the hole upon the roots, while another constantly pours in water, thus keeping the earth in a thin, muddy state. This operation will require consid-

erable time, but its success is perhaps more certain than that of any other mode.

The best compost-manure for trees, where the soil is poor, is a mixture of two parts of muck or peat-earth with one part of barn-yard manure, adding, if convenient, a small quantity of wood-ashes or pulverised charcoal. If these have been mixed some months, or even a year or two previously to being used, the composition will be all the better. Never put raw manure in contact with the roots.

4th. *After-treatment.* When the tree is transplanted in the fall or winter, it is extremely advantageous to place a conical mound, consisting of from five to ten bushels of soil or compost-manure, close around the tree to save it from being disturbed by the action of the frost. This mound should be removed in the spring. It is generally best to put a stake down, to which the tree may be tied, for the first season after being set. This ought to be done before filling up the hole, in order not to bruise the roots. Large cobble stones laid close to a tree, answer quite as good a purpose. [*See Chapter VII*]

If the tree languishes, when it commences growing, cover the ground in a circle of three or four feet in diameter around it, with coarse straw or litter from the barn-yard, laying on sods or stones to keep this from being blown away. This process is called *Mulching*. It keeps the soil moist, and in that state of equable temperature most favorable to the growth of young roots. Watering on the surface, without *mulching*, is almost always injurious. Feeble trees may also be benefitted, by shading them with pine boughs, &c. If, with all this care, the tree continues still feeble, head back its top yet more severely, and water the leaves and twigs, every evening, with a water-pot.

If, having followed all the above directions, the planter still finds his tree standing season after season, neither growing nor fruiting, but only existing, let him consult his true interest, by transferring it to the wood-pile. Why cumbereth it the ground?

Nursery trees, five to eight or ten feet high, are greatly improved by being taken up and re-set in rows again. Take them up, shape the roots, and head in and form the tops. If this work be properly done, the value of the trees will double in two years.

Small and medium-sized trees may be transplanted, with certain success, and without suffering scarcely a perceptible check, by the mode of *Balling* described in the next section.

SECTION III.

TRANSPLANTING LARGE TREES.

OWING to the humid atmosphere of England, large trees of the forest and the orchard, are frequently transplanted there without scarcely any risk of losing them. Here, the chances of succeeding are greatly lessened, by the hot penetrating rays of the sun, and the consequent transpiration of the trees. With suitable apparatus, however, and at no great expense, our large fruit trees may be re-set, in a manner similar to that just described for medium-sized trees. But the cheaper and safer mode is that called *Balling*. This mode is as follows:—

1st. *Hole for receiving the tree.* This should be dug, in the fall, before the ground is frozen. It should be made, say not less than from twenty to thirty inches deep, and at least two or three feet in diameter larger than the circular mass, hereafter described, containing the roots of the tree.

2d. *Removing the tree.* At a distance from the trunk of the tree, of from two to five feet, according as its diameter is from five to twelve or fourteen inches, dig a circular ditch around it, eighteen to thirty inches deep; smoothly cutting off all the lateral roots, close to the central mass of earth. This ditch, dug late in autumn, must be kept free from snow, until the enclosed ball containing the roots of the tree, is thoroughly frozen. With iron-bars and levers, force up this circular mass of earth, and place two or more strong skids under it. By means of a strong set of pulleys, with oxen attached, if necessary, the mass of earth, and the tree altogether, must be drawn over the skids up out of the hole, upon a stone-boat or sled, the tree standing vertically, just as it grew. Thus loaded and secured, it may easily be drawn to the spot selected for it.

3d. *Placing the tree.* Measure the depth of the ball containing the roots of the tree, and fill up the prepared hole to such a height, that the tree, when placed in it, may stand quite as high above the surrounding ground, as it did before it was taken up. Next, lay strong skids from the sled or stone-boat, into the hole, and slide the tree carefully into it, using,

if necessary, two sets of pulleys, for this is heavy work. Raise up with a lever, and block the mass of earth, until the tree stands properly erect, and then carefully fill in, all around and under it, with good soil enriched with compost manure. The earth for this purpose should be kept protected from frost, either under boards and straw, by the side of the hole, or in barrels, in some barn or cellar. The top of the tree ought, of course, to be headed-in, if much of the root is taken off. If deemed necessary, the tree, for the first and second seasons after its removal, may be kept supported by three long heavy stakes or poles, set triangularly, slanting, and bound against the trunk of it. Give it a good *mulching* the first summer, and it will be almost certain to live; and, when you gather its fruit or sit beneath its shade, and listen to the songs of birds among its boughs, you will feel repaid an hundred fold for the trouble and expense, attending its removal.

CHAPTER V.

PRUNING.

TREES which have been properly formed in the nursery, will afterward need but little farther pruning, except to remove suckers, broken limbs, and dead wood. This and other light pruning, may be done late in the winter, early in the spring, or in the latter part of June, just as it will best suit one's convenience.

What is called very heavy pruning; should always be avoided, if possible; but, when really necessary, it should be done in the winter or early in the spring.

To form the head of a large tree, which has been neglected for years, requires much judgment, caution and skill, it is labor that ought never to be entrusted to inexperienced hands.

In countries where trees are trained upon the sides of walls, fences or trellises, pruning is reduced to a science; but here little is attempted, in this way, except to promote the

growth, to improve the form, or to increase the fruitfulness of trees. Pruning ought to be performed with sharp tools. When the saw is used, the ends of the limbs should afterwards be carefully pared with a knife. They should then be covered with some composition to protect them from the weather. Downing's *Gum-Shellac* is admirably adapted to this purpose. This preparation is made by dissolving a quantity of the gum in alcohol, so that the composition shall be of the consistency of thin molasses. The liquid should be kept in a wide-mouthed bottle, the cork of which should have a wire (running through it into the bottle,) with a sponge attached to the end of it.

Thus prepared, the composition may be very conveniently applied, wherever it may be needed. We cannot too highly recommend this preparation for the purposes for which it is designed.

I. PRUNING TO IMPROVE THE GROWTH AND FORM OF A TREE.

THE growth and health of a tree may be greatly improved, and its form rendered far

more comely and beautiful, by a proper and seasonable pruning.

1st. *Heading-in.* Trees are headed back, in order to restore a balance of power between the root and the top. We have already explained this in the Chapter on *Transplanting*. Feeble trees of all sizes are benefitted by this treatment. When a large tree is to be grafted over, it may be headed back, if you choose, a year or two previously, and the scions or buds may be inserted into the young, thrifty shoots that will be emitted from the ends of the limbs where they were sawed off. By judicious grafting and pruning of these, a new, handsome, and very valuable top may be put upon an old and apparently worthless tree; but you must not forget to dig and enrich the soil around its roots, at the same time. Young trees, two or three years from the seed, or one year from the graft, are not unfrequently headed down to two or three buds, on purpose to strengthen their growth. A single bud is then trained vertically, and the rest pruned away in the course of the summer. In such cases, the growth of the top being attended with a corresponding increase of fibrous roots, the tree at once becomes vigorous and healthy.

Peach trees, in our climate, are highly benefitted, by thus shortening-in annually, in the spring, one-half, or thereabouts, of their entire growth of the previous summer, all over the heads of the trees.

Dwarf-pears on quince, also require a similar heading-in, annually each spring, so long as they continue to make a growth of scions.

2d. *Pruning to improve a tree's form.* This is quite a matter of taste. Shortening-in may be made subservient to this end, by cutting so as to leave a wood-bud just below the cut, on that side of a twig or limb which is farthest from the central parts of the tree, or which faces the direction in which it is desirable that the limb should extend its growth.

A tree may branch out too low or too high; its top may be too open or too crowded. The limbs also may cross each other in such a way as to give a disagreeable, tangled appearance to the head of the tree. It is always best to inspect a tree carefully, before commencing operations, and then to proceed deliberately; for one hasty cut may impair the beauty of a tree forever.

The lower side limbs of young trees, in the nursery, ought to be cut in, at first, to an inch

or two from the trunk; the next year, they may be cut in closely. Trimming up a small tree to a tall, smooth trunk, too suddenly, has a tendency to weaken its constitution, and to permanently injure it.

When the fruit cultivator does not do this with his own hands, he should take especial care to whom he entrusts it. Some cultivators consider the whole family of pruning tools as a nuisance, arguing that, by attending to the trees *in season*, the whole business of pruning can be accomplished, by the thumb and finger only,—*pinching off*, in the bud, what in future years might make work for the saw or knife.

II. PRUNING TO INDUCE FRUITFULNESS.

Scientific pruners have the power to extort from their trees large crops of fruit. But they well understand, that it is not *always* their true interest to exercise their skill for this purpose. Nor is this without reason; for erroneous opinions prevail in regard to the productiveness of trees. The sap that produces fruit, is so much withdrawn from that general circulation which causes the growth

of wood and leaves. Consequently, whatever treatment a tree receives, calculated to obstruct the flow of the sap, or to accumulate it at any point, causes the formation of blossom-buds, and the subsequent production of fruit. There are a variety of modes to accomplish this, which will be described in the proper place. This end is attained by *pruning*,—

1st. *By pruning the top.* Hence the excellent practice, above described, of *shortening-in* the Peach, Nectarine, and Apricot, has this farther desirable result of causing the sap to collect in the remainder of the branches. While we thus diminish the bearing wood, and of course the number of specimens of the fruit, we greatly enhance the valuable of the crop. For one large peach—and it is generally true of other fruits—is worth twice its weight of smaller ones of the same variety. A similar shortening-in of trained fruit trees, practised in England, at mid-summer, causes fruitfulness, upon the same principle. Thinning out the crowded head of a large tree, also has the same effect, the superabundance of sap, supplied by the roots and trunk, inducing the growth both of wood and fruit, in the remaining parts.

2d. *By pruning the root.* This mode of stunting the growth of a tree, and thereby causing that accumulation of sap in the branches, necessary to the formation of fruit-buds, is one of the very best ways of inducing fruitfulness that we are acquainted with. This work may be done in autumn, in winter, or early in the spring.

At a few feet from the trunk of the tree, varying the distance according to its size, dig a circular ditch around it, eighteen or twenty inches deep, cutting off all the lateral roots smoothly, close to the circular mass of earth in which the tree stands, removing the outer pieces of roots, from the surrounding ground, as much as can be done conveniently. Fill up the trench, with good, rich soil, and the tree will, in this country, generally be brought into a permanent fruit-bearing state. Repeating the operation annually, apples, pears, and other fruit trees may be rendered productive dwarfs,—even so as to be planted only six or eight feet apart. And, if at the same time, we apply the *shortening-in* process above described, they may be kept in a beautiful pyramidal form, and rendered very profitable.

There are some important advantages arising from this practice.

1. Root-pruned dwarfs will do well in the poorest land, provided they have a few bushels of good earth under and around them.

2. They may be transplanted as safely and almost as easily as a geranium may be repotted.

Trees dwarfed by grafting, [*see Chap. II., Sec. 2d,*] may be rendered still more diminutive, by this practice; but caution is necessary, for it is easy to overdo this work, and thus to enfeeble and finally destroy what we intended to improve.

Any fruit tree, in a languishing condition, by a combined application of root-pruning with a somewhat severe heading-in of the top, may be wonderfully renewed in health and vigor.

CHAPTER VI.

TRAINING.

This constitutes more than one half the labor of an English fruit gardener. In the United States, out of the vicinity of Boston, it is but very little practiced, and, except in the extreme northern parts of the country, it is not to be recommended to the *economical* cultivator.

1. *Training upon a trellis or wall.* The British gardeners train their trees perfectly flat. Taste and ingenuity may weary themselves, in varying this mode of forming trees. But taste will always have a regard for a symmetrical regularity, in the arrangement of the branches of the tree, and ingenuity ought in all cases to conform to the requisitions of taste.

The branches may be trained regularly downward, horizontally, or upward in a fanlike manner. It ought to be borne in mind, in pruning to shape a tree, that

whenever a twig is cut off, the buds on it below the cut, have a tendency to turn into limbs. The same operation may again be performed upon these limbs, and so on. A knowledge of this fact, a skillful hand, and good taste to guide it, will ensure success in all the modes of training which an American will wish to practice.

Out-door grapes may be easily trained in a fan-shaped form, having but one smooth trunk coming out of the ground, and branching at from one to three feet high; or two branches only may be suffered to grow horizontally, like two arms, and, from those parallel perpendicular shoots may be trained upward, at equal intervals from each other. Another pair of arms may be made three or five feet higher up, and perpendiculars also trained from these as before. Late in the autumn, or in the winter of each year, cut down these perpendiculars, to within two or three buds (or *eyes* as they are called,) of the horizontal arms, and in the following summer train up other new shoots, precisely as before, suffering only one shoot to grow in a place. When these perpendiculars have fairly set

their fruit, pinch off their tip ends, for the purpose of forcing the sap into the fruit.

This may seem severe pruning, but, if you desire fruit, instead of wood and leaves, you will find your account in it. The health and longevity of the vine does not seem to suffer at all, by this treatment. The grape, cultivated under glass, is even more subjected to the knife,, than it is in this mode of open culture. [*See Allen's Treatise on the Grape Vine.*]

Late autumn, or winter, is the best season to do this work, so far as the knife is employed in it. The vine, and all other trees that are inclined to bleed, should receive their heavy pruning at this season, and their very light trimmings in mid-summer.

The vine, and other trained trees, are fastened to their trellises, or to the sides of walls or buildings, by means of shreds of bass-matting, twine, or leather loops put round them and nailed. The walls or trellises should face the south or south-west, in preference to other points of compass.

It is hardly within the province of this little work, to enter into a more particular description of the training of trees upon walls and trellises. Those who desire to investigate the

subject further, will find details of the modes of operating, in English horticultural publications. A mode new of training fruit trees, practiced in the north of Russia, is well deserving of trial in the colder parts of New England, especially for cultivating the peach. A tree, one year from the graft, is headed down to two healthy, strong wood-buds. These are trained horizontally, about ten or twelve inches from the ground, to a south wall;—perhaps the north side of a wall might do quite as well, in our more changeable climate. These *arms* are suffered to throw up vertical shoots, which become covered with fruit-spurs. These vertical shoots are kept shortened-in, to a length of not more than about one or two feet; and these with the two horizontal arms from which they spring, and the short trunk of about ten to fourteen inches, in length, constitute all there is of the tree above ground. The whole tree may be covered, through the winter, with two feet or more of soil heaped over it, with a deep bank of snow, or with straw, evergreen boughs, or the like.

We have had a similar experiment repeatedly *try itself*, in our garden, where a low limb of

a peach happened to pass the winter under a snow-drift. This branch would show a beautiful festoon of fruit, the following summer, while all the rest of the tree, having dropped its frozen blossom-buds, would remain through the season, like the fig-tree of the parable, having "nothing thereon but leaves only."

Instead of only two arms, the Russians, with equal success, sometimes plant the tree in open ground away from a wall, and train similar arms out in every direction, like the spokes of a horizontal wheel, tying them down thus to trellises made for the purpose. The apple, the plum, the cherry have been, and perhaps all fruits might be cultivated in this way. A reflecting mind will easily take hints from these practices, and vary the mode of operating to suit the circumstances of any tree that it may be desirable to subject to such or a similar regimen. This mode of training has other advantages. The fruit is less exposed to the wind, the trees also come earlier into bearing, and it has been noticed that they are less persecuted by insects.

2. *Training of Standard Trees.* In Chapter Vth, (on *Pruning*,) we have given

some general directions for forming standard trees, and regulating their growth.

Except for the dwarf pear, this work does not need to be done in this country. We have thought it best to describe the mode of pruning dwarf pears, in the part of the book treating of those trees. [*See Part II. Section on Dwarf Pears.*]

CHAPTER VII.

MISCELLANEOUS.

SECTION I.

PURCHASING, PACKING, FORWARDING, AND RECEIVING TREES, GRAFTS, &c. &c.

Purchasing Trees. What has thus far been written, will, we hope, prove serviceable to those who purchase trees at the nurseries. For the benefit of persons who have little experience, we will now recapitulate, and add some further general directions for buying fruit trees.

1. Do not buy of pedlars or irresponsible persons. Such dealers may offer you trees which have received exposure sufficient to cause their death, before they are put into your hands; or the trees may be labelled as one thing, even when the vender knows them to be something else comparatively valueless.

2. Select, although at a higher price, trees which have been re-set twice or (better yet) three times since they came from the seed. You will find that such plants possess much finer roots than others, and that they will suffer far less check from another transplanting.

3. In general, avoid trees which made but little growth, the summer preceeding your purchase.

4. Observe where the tree is grafted. Generally, the nearer this point is to the fruit-bearing parts the better. We should, however, rather prefer trees grafted at or below the surface of the ground to those where the operation was performed between that point and the point of branching-out. But a fine healthy tree worked at any point, is not simply on that account to be rejected.

5. The trunk of the tree should be straight, smooth, and stocky. It should branch out, at the proper height, and the branches should extend upward and outward, forming a handsome open top. If the limbs are crooked, entangled, crowded and crosswise of each other, it may be difficult for you ever to get them into the form you wish, and therefore

it is not advisable to purchase a tree of that description.

6. Avoid trees of which the grafted part is growing larger than the stock. This is an evil that will increase, and, unless the point of junction is at or below the surface of the ground, the tree will disappoint any very favorable expectations that its cultivator may cherish in regard to it.

7. Do not be tempted by a cheap price to buy a diseased tree. Unless you are a very skilful cultivator, you will find much more profit and pleasure, in taking care of healthy trees, than in endeavoring to nurse those which are sickly. A nurseryman of the first rank in his business, will hardly offer such trees for sale, at any price.

Packing Trees, Grafts, &c. The trees having been taken up carefully, lay them upon the ground, placing their roots even with each other, and interlocking the branches so as to get them as compactly together as possible. With old ship-rope, or any soft cord, bind the package firmly together, tying one cord around close to the roots, and one or two more around the branches; then immerse the roots in very muddy clay water, so as to give them a coating of earth.

Next, let one person hold the bundle on end, the roots resting upon a bass-mat. Sprinkle among and around the roots, a mixture of moss and wet straw; then tie, or sew the matting over them, so as to completely protect them from exposure. The remainder of the bundle may be covered with rye straw laid longitudinally and bound around it with twine or old ship-yarn; or the entire package may be sewed up, like the roots, in bass-mats. When trees are to be sent a very great distance, and of course are to be out of the ground a long while, their roots, after being immersed in the clay water, are suffered to get dry, and then the trees are packed immediately in boxes, and the interstices among the branches and roots are filled with dry moss. Trees are very successfully brought across the Atlantic in this way. It ought to be borne in mind, that it is death to the roots of a tree to suffer them to freeze, *out of the ground*, and that it is injurious to allow them to get quite dry, in the air. Either exposure is entirely fatal to the class of evergreens.

Where trees are sent only two or three days' journey, their roots may be packed in *wet* moss. Scions may be packed in boxes of

sand or dry moss; buds should be put into moss only. Fruit is best put up, for long transportation, in layers of cotton-batting, and closely packed thus by hand, in clean tight boxes.

Receiving Trees, &c. On receiving trees from a distance, examine the roots. If these are moist and fresh, they are in a proper condition for setting. But, if they appear dry or shrivelled, soak them in water, (if frozen, in very cold water,) from six to twenty-four hours. If the trees have suffered so much that their tops also are shrivelled, it will be well to put the whole package under water for a few hours. After this take them out, *head-in* the tops, using as much severity as the previous exposure of the package would seem to require. The trees should then be set, (see *Transplanting*,) and the ground ought to be *mulched*, for the first season. Should the ground not be ready for planting out the trees, *lay them in by the heels*, as it is called; that is, dig a trench and put the roots of the trees into it, letting the tops stand upright, or lean down quite slanting, as you may find it the most convenient; then bury the roots in the ground, and the trees may remain

for weeks, and, if they are received in the fall, even through winter, without injury. Trees *heeled-in* in the fall, should be put down quite deep, and the tenderer sorts, especially if they have come from southern nurseries, should lie in a very sloping manner, having their tops protected by coarse litter or straw. It is still better to open a deep trench, in a perfectly dry spot of which the texture admits of easy filtration. Let the depth of the trench be some three or four feet, and the width sufficient to contain what trees you may have. Place the trees, root and branch, horizontally in the trench, filling in, among them, with light sand or vegetable mould. After this, cover the whole, to the depth of two feet, with earth. In extremely cold latitudes, the trees ought to be buried still deeper.

Southern trees may also be kept through a northern winter, by *heeling them in* in a cellar. They may also be brought from the south, early in the spring, and *heeled-in* in a cellar, till the weather shall admit of putting them in, out of doors; or, if well packed, they may remain in packages in a cool dark cellar, for two or three weeks, quite safely. Southern trees, excepting perhaps the pear, properly

taken up, properly forwarded, and properly treated when received, are not much inferior to trees which are grown here. Those which are generally brought here, have been raised under high cultivation; and the purchaser not keeping up the same forcing culture, the trees have languished and died. Thousands of fine southern trees have also been lost, by other kinds of erroneous treatment which they have received, before and after coming into the purchaser's possession.

We may add, here, in this connection, that a root of a tree may be weakened by *exposure*, as well as by diminishing its size; and, therefore, a regard should be had to both these conditions, when we head-in its top, to restore a balance of power between the root and branch.

SECTION II.

SOILS, MANURES, LOCATION OF ORCHARDS, &C. &C.

Soils. Downing says a *strong loam*, that is, a loam having just sufficient inter-mixture of sand to make it easily worked, is by far the best soil for a fruit-garden or orchard. A farmer will be less likely to misunderstand, if we should recommend, as the best general soil for an orchard, that which will produce seventy to one hundred bushels of Indian corn to the acre.

This kind of soil, and also that which is called a *clayey loam*, derives great benefit from the subsoil plough, or, what is far more expensive as it is also much better, trenching and mixing the sub and upper soils together, say for a depth of from eighteen inches to two feet. Whoever is willing to be at the expense of this work, in a small fruit-garden, will find himself repaid by the beneficial effects which the labor will have upon the growth and health of his trees.

Where the sub-soil is sand or gravel, top-dressing with a little clay and a generous quantity of well-rotted manure, is the best treatment.

When the whole garden or field cannot be worked over, in this way, a large proportion of the benefit may be derived, from preparing a place six to twelve feet in diameter, around and under each tree according to its size.

Low, flat land, spongy or peaty soils, particularly in our cold climate, are very unfavorable to the growth of fruit. Something, however, may be accomplished, even in such locations, by setting the trees quite high, and placing under them in the holes a drainage of small stones and gravel; and by mixing with the soil a quantity of sand, so as to diminish the amount of moisture, and to increase the warmth which the roots may need to enjoy.

General Manure for Fruit Trees. The best manure for fruit trees in general, is composed of about equal parts of meadow mud, muck, or peaty earth, and common stable manure. A small quantity of wood ashes, say four bushels to a cart-load of manure, and charcoal dust in about the same ratio, may be intermixed with this composi-

tion, to great advantage. This manure will be greatly improved by having been prepared and well worked over, some months previously to using it.

Half a peck of bone-dust and a little lime, well mixed with the soil when setting a tree, or from a peck to a bushel of old broken bones, put into the bottom of the hole, before setting, will produce the most satisfactory results for years to come. Almost any well composted manure suitable for corn, will also answer for fruit trees.

Where meadow-hay, straw, or sea-weed (*or sedge*) is cheap, an annual *mulching* with these will be found extremely beneficial.

Specific Manures. Much attention has been bestowed upon this subject, within a few years. When the soil and exposure are adapted to the wants of any tree, the very best specific manure or fertilizer for it, is unquestionably the *debris* (or perfectly decayed particles) of a tree of the same species.

There are, however, far more available fertilizers than these. We are indebted to Downing's Horticulturist chiefly, for what we shall say further upon this subject.

The Apple. A peck of air-slaked lime to a tree, scattered and slightly hoed in under it in autumn, in a circle of six or twelve feet in diameter, according to the size of the tree, will generally answer. This application, and an equal quantity of wood ashes, applied each alternate autumn, with a top-dressing of the general compost manure above-described will keep an apple tree in fine condition, so far as it is influenced by the soil.

The Pear. A small quantity of rusty iron among the roots of the pear, gives a fine healthy appearance to the tree. Another—dissolve a pound of potash in water, and thoroughly water two bushels of swamp earth or muck with it. Let it lie, two or three days, and then put a top-dressing of about a bushel of this compost to a tree.

The Peach. Apply half a peck of old rusty iron, lightly hoed in close around the tree. A half pint of common salt applied annually, is also beneficial to the peach, and nectarine.

The Plum. A quart of common salt and three quarts of lime applied, in the autumn of each year, as a top-dressing, will keep a

middling sized tree in fine condition. Of the two, the salt is more essential than the lime. The branches and trunk may be watered with weak brine, occasionally to much advantage.

The Cherry. The general compost manure, with the addition of sand where the subsoil is clayey.

The Quince. The same as for the apple, with the addition of a small quantity of salt, applied as to the plum.

We know of no better fertilizers for other fruit trees and orchards, than the compost or general manure, above described. Indeed, those which we have just described *may* not be the best. The whole theory and application of specific fertilizers, is as yet very imperfectly understood.

Location of Orchards. The tops of *very* high hills, and low sandy plains, are not favorable locations for an orchard. The hill-sides are the preferable land for fruit, as they are for almost every other crop. Downing prefers those slopes which look toward the south-west; others consider other aspects equally favorable. But, while we would concur in Downing's preference, we should by

no means hesitate to plant a fruit-orchard even upon a northern slope, if convenience should require it; for fine, flourishing fruit trees of every species, may be found growing in every possible exposure, both as regards the sun and the wind.

Orchard Position of Trees: There are various modes of planting out trees in the orchard.

1. The *equidistant plan* of straight parallel rows, the trees standing as in the corners of the squares of a chess-board. This is the common mode in use with our farmers, generally.

2. The *thick or hedge-row plan* is a modification of the above, by which the trees are placed quite closely together in the rows, the rows being left more widely apart to make amends for this lateral crowding. It is an excellent practice to set, alternately in each row, apples and pears, and a peach or dwarf-pear between each of these. The peach or dwarf will be worn out with age, before it encroaches upon the apple and pear, and the apple even will be infirm with years, before the longer-lived pear shall have attained its maturity of growth.

The hedge-row mode of setting peach-orchards, works admirably. It is also recommended where it is an object, to make the most of what is called the *under crop*—potatoes, onions or the like,—in contra-distinction to the fruit which is called the *upper crop*. The rows ought to extend north and south, thirty to forty feet apart, and the trees should stand about eight or twelve feet from each other, in the rows.

3. The ancient *quincunx* plan—where the trees are set in the centres of equal circles in contact with each other—is recommended when one wishes his fruit plantation to be as compact as possible. This is the same as the above-described equidistant plan, excepting that the trees, in each alternate row, *break joints* with each other, as the phrase is, a tree in one row being opposite to a space in the next, etc. When trees of different longevity are in this way properly intermixed, the closest order of planting has been attained.

Some recommend to have the rows, in each of the above plans, occupy the centres of broad flat parallel ridges like a turtle's back, the ridges running lengthwise with the

rows. This secures more warmth and better drainage.

4. The *irregular plan of planting*, after the manner of an open natural forest, often produces a fine effect. We have seen this successfully accomplished even upon a small scale; but it is better adapted to large plantations, where winding ways, hills, rocks and valleys aid in diversifying the landscape.

Trees in Grass Ground. Trees in mowing-land should have a circle of six to ten feet in diameter around each, kept in a cultivated state. A skillful ploughman, with a manageable team and a careful driver, can do this work, two or three times in a season, very expeditiously, by going down one side of a row and up the other, putting in shallowly and turning out the plough neatly at the proper places. Twice a year will answer for this work. But have a care how you entrust such labor to unskillful or careless hands. Such may do the work with a bog-hoe or spade, taking special care not to bruise the roots in the least.

Some laborers are so rough, that they ought not to be allowed even to look over the fence

which encloses an orchard, or a nursery. And we may further remark, that the whole business of cultivating fruit trees, from the sowing of the seed to the gathering of the fruit, ought to be entrusted to none but very careful men—men of good sense, taste, *skill and* FIDELITY.

Fruiting, &c. Some of the causes of fruitfulness have been explained already. [See Chap. V., Sec. 2d, and observe the general principle there stated.] The natural and correct inference from that principle is, that *neglected cultivation, bending, distorting*, and even *girdling* the limbs, a *hard lime-stone* soil or top-dressing with lime, *dwarf-grafting*, and, in a word, whatever tends to *stunt the growth*, or induce premature old age, operates as a cause of fruitfulness. But a word more. As the little boy cannot have his cake and eat it, so the overgrown boy—we came very near saying booby,—who is so importunate as to require an immediate income from his young orchard trees, ought not to complain of their feeble health and early decay.

First Fruiting. Beware of hastily forming an opinion from the first fruits of a young tree. We have known a peach, through feebleness, produce little, green, worthless fruit,

the first bearing season, and, the very next year, the tree being abundantly supplied with sap, the peaches would grow and swell out into large, beautiful, delicious red rareripes. We have also frequently seen an almost equal improvement in the pear, sometimes even extending to the third or fourth season of fruiting; and, further, it ought to be understood that the fruit of some varieties, particularly of the pear, may be excellent one season, and only ordinary or indifferent the next, for causes not yet well understood.

Thinning-out Fruit. The fruits of the pear and the peach, and, indeed, of all fruit-bearing trees and shrubs, may be greatly increased in size, by thinning out the young fruit when it is fairly set. And, as the largest specimens are always the most valuable by the quantity, this will often be found, by the careful cultivator, to be a profitable operation.

A single peck of large, luscious rareripes, is worth a bushel of those little, tough, fibrous abominations, such as it is the height of impoliteness to offer to a well-fed pig.

Peach trees, annually *shortened-in*, will, in general, scarcely need to have their fruits thinned.

Specimen Trees. Amateur cultivators and nursery-men, will often find it convenient to have one or more specimen trees of apples, pears, &c. Twenty to forty or fifty or more varieties, may easily be worked upon a single tree; and one, in this way, may multiply specimens to almost any extent, even upon a small piece of ground. Dwarf pear trees are very pretty for this purpose.

SECTION III.

INSECTS, DISEASES, REMEDIES, &C.

To purchase the best trees, and to set them in the best location, and in the most careful manner, is so far well. But much more than this is necessary. The soil must be tilled and occasionally fertilized, diseases require their appropriate remedies, insects must be destroyed, suckers and dead wood must be pruned away. Indeed, there is scarcely a month in the year, when the hand of the careful cultivator may not find profitable employment among his trees.

We shall, in this place, speak in very general terms of insects and diseases. In the destruction of the one, as in the curing of the other, the orchardist ought always to make a prompt and seasonable movement; for insects increase with astonishing rapidity, and diseases, long neglected, can hardly be eradicated without destroying the life of the patient.

Insects are kept away from plants and trees,

chiefly by strong offensive odors. Some of those that have proved effectual, are the odor of *chamomile*, that of coal-tar from the gas works, the vapor from oil of turpentine, &c.

Insects may be killed, by liquid applications. The best liquids yet known for this purpose are *tobacco water*, and diluted *whale oil soap*.

Tobacco water is made by boiling any refuse tobacco in water. It must not be excessively strong.

The whale oil soap is prepared, by mixing one pound of it with seven or eight gallons of water. These liquids may be applied to plants, with a water-pot, or a syringe having a water-pot rose upon the end of it so as to scatter the water more effectually.

Half a pound of quassia, boiled a few minutes in six quarts of water, is a liquid said to be quite as efficacious as the tobacco-water.

All plant lice and almost all small insects, can be killed, by the application of either of these liquids. A mixture of them might possibly be even more effectual than either used by itself. Strong suds made of common soap answers tolerably well, in many cases.

Much has been accomplished, by kindling

bonfires in a fruit-garden, at night. Thousands of winged insects, from a sort of instinctive fondness for the light, fly into these fires and perish at once.

Wide-mouthed bottles, filled with molasses and water, and suspended among the trees, will speedily become full of insects.

The animal tenants of our grounds—the toad, and the bat,—will also lend us their valuable assistance, if we are kind to them. The sparrow, also, the robin, and some other birds, render such important services in the extermination of various kinds of vermin, that the fruit-gardener ought always to cultivate their friendship, notwithstanding their disposition to test the quality of his finest cherries and other smaller fruits in their season, laughingly warbling their criticisms in his face, at the same time.

Nearly all diseases in fruit-trees are occasioned, or greatly aggravated by insects. We shall treat of these more particularly in the following pages, under the head of each class of fruits.

Fruit Stealing. Other "*varmints*," larger although more despicable than insects, sometimes sneak into your fruit-grounds, to

steal and destroy. Every man who enters your enclosure without your consent, and takes away, from off or from under a tree, an article of fruit, is *a thief*. Deal with him as such. Keep him out with a picket fence, or a watch-dog. Apply the scourge and the disgrace of legal prosecution. Perhaps the experiment of thorn hedges may be found to answer a good purpose. But if these dissuatives fail, like the turf of the old man in the fable, you must "*try what virtue there is in stones;*" for while so many of our American citizens continue to steal our fruits, and thus evince a wicked meanness which would disgrace a savage in uncivilized countries, certainly a man can hardly be censured for defending his fruits, cultivated or wild, from the poacher, in the same manner that Uncle Sam himself is wont to repel an invading enemy from his own large and growing plantation. As the penalty for the theft ought to be in proportion to the difficulty of identifying the thief, he who pilfers from an orchard deserves to be far more severely punished, than the easily-caught purloiner from a fruit-stand in the market. And further, whenever the law of the land fails to protect a spirited

man, he will not be backward in making and executing *a more effectual law* of his own.

More might be said, but less would suffice, if the men of the school-house and the pulpit would all fearlessly discharge the duties incumbent upon their stations. In some heathen countries, *where we send our missionaries*, the necessity for fences, locks, and other protectives against the *sin of theft*, is entirely unfelt and can scarcely even be conceived of. .

SECTION IV.

IMPLEMENTS, MATERIALS, ETC., USED IN THE NURSERY AND ORCHARD.

Labels. There are various modes of labelling trees. Labels of pine or cedar, brushed over with white paint, and written upon with a lead pencil before the paint is dry, answer a good purpose for six or eight years. They should be fastened to the tree, with copper wire, in such a manner that they will not be blown about and broken off by the wind, and they should be watched occasionally, lest the tree grow so as to be girdled by the wire.

Lead labels, stamped with type or dies, are far more durable. They may be made of long narrow strips of the metal, and wound round a limb or twig of the tree, or they may be attached by means of copper wire.

A convenient, cheap, and very durable label, may be made of zinc.

1st. *The Form.* Cut strips of zinc of an elongated triangular form, ten to twelve inches

long, half an inch wide at one end and running to a point at the other.

2d. *The mode of Fastening.* About four inches from the wide end of one of these strips, cut a slit, or punch a hole. Bend the pointed end of the label over a twig of the tree, and put it, say one-fourth of an inch through the slit or hole, and clinch it with the fingers or with a small pair of pincers. It may then easily be bent and shaped, so as not to be moved by the wind.

3d. *The Writing.* Write with a quill pen, on that part of the label between the hole and the wide end. The ink to be used is made of—Verdigris, (powdered) two parts; sal ammonia, two parts; lampblack, one part; water, twenty parts. Mix these ingredients in a mortar, using at first only so much of the water as suffices for mixing them, and adding the remainder afterward. Put the ink into a well corked bottle, and shake it from time to time. In a few days it will be fit for use. When laid away, let the bottle stand cork-end downward, to prevent the escape of the ammonia. The ink may, in this manner, be kept ready for use, for years.

Labels of this description cost but a trifle

more than wooden ones, and they will remain upon the trees, and be legible, during a man's life-time. Instead of this ink, the writing, made with a common lead pencil, becomes, after two or three days' exposure without wetting, almost indelible, and will last for a long time.

The initials of a name, or the number of a fruit, may be cut in the bark of a tree without injury. Such marks remain legible for many years.

Supports. Trees newly set, often require support against the force of the wind. When a stake is used, it ought to be three or four inches in diameter. There will be an advantage in setting the stake in the hole, before planting out the tree. The bottom of the stake may stand, one or two feet from the bottom of the tree, and the top may slant up so as to touch the tree. Pare the side of the stake next the tree smoothly, in a crescent form, so as to fit the form of the tree, and bind the two together with a soft rope, previously winding an old cloth round the tree to prevent its being chafed by the stake. Short stakes, two feet above the surface of the ground, are often sufficient for the support of a tree.

Large cobble stones, of the size of a bushel basket, laid close around a newly set tree, are quite as good as stakes.

Tools, Materials, &c. Many and various tools and materials are employed in horticultural labor. The *Tree-scraper* is used for taking off moss and rough bark, from unhealthy or large trees. The *Pruning-knife* is a large hooked jack-knife, for cutting off the smaller limbs, in pruning. There are several kinds of *Pruning-saws*; some are narrow, so that they may be used to make a curved cut; some are contrived to be fitted upon a pole, so as to cut limbs not otherwise easily accessible. A common small handsaw will answer nearly every purpose. The *Budding-knife* is used for budding; the *Grafting-chisel*, for grafting. The *Nursery-shears* are used for pruning limbs of the size of the finger and smaller. A modification of these, called an *averruncator* by the English, may be attached to a pole and worked by means of a cord. These are sometimes used in cutting scions, clearing off caterpillars' eggs, or, with a little basket attached, in gathering a fine specimen of fruit, not easily to be come at by other means; when made quite strong,

they are serviceable to the pruner. *Portable Steps, or Self-supporting Ladders*, are of great use, in gathering fruit, killing insects, &c.

Russia matting is used for packing trees, and shreds of this material are extensively employed in budding, tying, &c. American matting, made of bass-wood, has recently come into use as a substitute for the Russian.

Common meadow moss, is one of the best things in which to pack the roots of trees, or buds or scions which are to be sent some distance. Buds and scions may be wrapped singly, in *oiled silk*, when one wishes to send them to a distance.

Stakes for heading nursery rows, to be durable, ought to be made of chestnut. They should be two or three feet long, having their upper ends planed smoothly for a space of eight or ten inches. This smooth part should be brushed over with white paint, and immediately written upon with red chalk.

SECTION V.

THE NURSERY BUSINESS.

MANY American nursery-men have failed; others have abandoned the business for more lucrative employments; a very few have found it a tolerably profitable occupation for a series of years.

A great deal depends upon the location, in itself, and also with reference to a market. The same capital and labor employed upon one piece of land, might bring in a handsome return, on another, the loss would be ruinous to the proprietor.*

* *The location* in itself.—A somewhat elevated, gentle slope, looking toward the south or southwest, is perhaps the best aspect. A deeply tilled, highly enriched sandy loam is the best soil for the generality of nursery trees. Cultivate cherries and peaches upon the highest and driest parts; upon the next lower ground, apples and plums; still lower down, quinces and grapes.

The location in reference to a market.—Experience has proved that a location in the suburbs of a large town or city, although costing \$500 to \$1000 per acre, is better than a retired locality upon much cheaper land; for a nursery-man must sell as well as cultivate his trees.

The whole annual cost of conducting a nursery, in New England, for a series of years, will not fall short of \$200 per acre.* A few lines will exhibit some of the items of this expense :

<i>Rent, or Interest</i> on suitable land, near a good tree-market,	\$30,00
<i>Labor</i> , of men, &c.—planting out, cultivating, grafting, pruning, taking up, selling, &c.,	90,00
<i>Stock</i> ,—including a due proportion of the first outlay, the annual cost of seeds, stocks for grafting, tools, &c., &c.,—taking the annual average for a series of years,	35,00
<i>Manure</i> ,	15,00
<i>Advertising</i> ,	5,00
<i>Incidental expenses</i> ,	5,00
<i>Interest</i> , annually accruing on these outgoes before the trees are sold,	20,00
<i>Total Annual Expense</i> of a one-acre nursery,	\$200,00

The above items would vary greatly of course, in different localities, and also, from year to year, in the same nursery. Such an average estimate cannot be very accurately made ; but whoever thinks it may be too large, will find no difficulty in swelling it to the present amount, by adding the *losses* arising

* This cost is very clearly shown, in detail, in the Albany Cultivator—Sept. No. of 1848—page 279. Two *very* important errors, in the article, will be found corrected on the 310th page of the Oct. No. of the same year. Ambitious young nursery-men will do well to read attentively the article alluded to.

from the numerous accidents that destroy so many young trees, and from the *depreciated value* of fine trees that have become unpopular varieties since they were grafted; the *bad debts* also, which are never paid, the cost of collecting *good debts*, *discount* on retail prices, &c., &c.

Five thousand *saleable trees* are the very utmost that an acre will, in general, produce. The average age of the trees sold, is certainly not less than five years. Therefore, but one thousand trees, upon an average, can annually be sold from a one-acre nursery; in favorable years, more, in others, less.

Thus it appears that five years' old nursery-trees must be sold at an average price of about twenty cents apiece to defray *expenses*. But the nursery-man must support himself, not from *outgoes*, but from *profits*! Put the price at twenty-five cents a tree, and fifty dollars profit will be left annually in the hands of the proprietor of a one-acre nursery. If it be objected to this calculation that many trees are sold at much higher rates, let it also be understood that such trees are often eight or ten years old. In a word—from a *little* experience, and from considerable observation of,

and enquiry into the experience of others, we very confidently affirm it as our belief that the nurseries of New England have not, for the last ten years, yielded a net profit equal to fifty dollars per acre for the grounds which they have occupied.

Again, young trees are liable to many injuries. Thousands are winter-killed. Others die from the uncongenial nature of the soil. The inserted buds are frozen; the grafts are dried up; the trunks are gnawed by mice; the roots are thrown out by the heaving of the soil; the foliage and the young growth, in a dry season, are often destroyed by lice and other vermin.

Thousands upon thousands of fine trees are lost every year, in some or all of these several ways. Many perish under the hands of unskillful or careless laborers. Many also, with the best care, never become saleable, from crookedness, deformity, &c., &c.

Nor is this quite all. A fruit, this year extremely popular, will tempt the nursery-man to graft it very extensively. Three or four years hence, when these trees are ready for market, lo and behold! further trial has fairly and satisfactorily proved the variety to be

worthless. Thus, all these grafted trees become at once unsaleable, and their value sinks *even lower* than that of good thrifty stocks of the same age; for many of them will hardly out-grow the severe discipline of another grafting.

Whoever contemplates engaging in this business, must also bear in mind, that the faithfulness and ingenuity without which a very considerable part of the work were better not done, cannot be commanded at the ordinary prices for which an Irishman will shovel gravel. So true is it that the more of intellect or of other qualifications is required of labor, the more exacting does it become. You must pay for a two-footed simpleton more than for a horse, for an American more than for an Irishman, for mechanical labor more than for field work, for professional services still more, and so on.

It will be seen at once then, that, under these circumstances, a nursery-man, who is his own foreman and labors constantly in the field with his men, might support his family by the business, while another, of more genteel ideas, would find it difficult to live by it.

And there is another strong reason for this

difference of result. As a Roman writer observed, two thousand years ago, "Wherever the eyes of the master most frequently approach, there is the greatest increase." Every one knows this to be true in general, but unreflecting inexperience does not know that the expression has a very peculiar force of meaning, with reference to the management of a nursery.

Another thing,—the nursery-trade is not to be learned in a single week. 'Ten years' experience might grow rich in the business, where five years could hardly get a living, and a yearling novice would certainly starve.

The nursery business requires very much more skill than ordinary farming, and its profits are far more uncertain. Upon the whole, it is a much better avocation, to amuse a rich man's leisure, than to replenish a poor man's purse. The reader may rest assured, that there is no more *satisfactory* way of arriving at a *realizing* sense of the truth of this assertion, than to give the business a thorough trial. For ourselves, we confess that we have fairly and clearly "*seen the elephant*" that eats up the profits of raising or buying fruit trees, for sale.

SECTION VI.

THE ORCHARD BUSINESS.

As we have remarked elsewhere, there is no better orcharding country in the world, than the hill-sides of New England. A little detail will show what might be done in this business. Forty apple trees of the largest size can stand upon an acre; and, producing annually but two barrels apiece, the crop is worth not less than a hundred and twenty dollars—which is the interest of two thousand dollars per acre. Deducting the cost of the labor of managing it, and making every allowance for other drawbacks, and this business would still appear to be more profitable than any other kind of agriculture. But since *what has been* may be more satisfactory than *what might be*, we appeal to facts. From the windows where we are writing, we look out upon apple trees, which we *know* have produced, during the last ten years, an annual net profit, fully equal to the interest of one

thousand dollars per acre, for the land which they have shaded. And let no one anticipate a glutted market, so long as our manufacturing villages, yearly increasing in number, are still but imperfectly supplied, and particularly so long as the fruiterers of London palm off the products of British orchards, under the attractive recommendation of "*American apples.*"

Much of the rocky hill-side land of New England, now considered unavailable for other uses than that of pasturage, could, with a moderate outlay, be converted into excellent orcharding. It seems very strange, that our farmers should think so lightly of this very feasible operation, now that the demand for cider no longer requires to be supplied. A bushel of Baldwins, never worth less than *forty cents*, may be grown with but little more expense than it formerly cost to raise a bushel of nondescript apples, which, in the palmiest days of the cider-press, never were worth more than *ten cents*. Most marvelous mistakes have been made, in cutting down old cider-orchards, instead of saving and grafting over the most healthy of the trees. Many such trees, thus altered into good fruit, scraped,

dug around, and manured, would have gladly given the farmer five dollars worth of fruit, for every day that he might have thus kindly devoted to them. The case of old neglected pear trees is still more deplorable.

A hundred standard pear trees need not occupy over an acre of land. Their annual crop, if of proper varieties, would certainly not fall short of the value of five dollars for each tree. Excellent judges assure us that this estimate is quite too low. But even at this moderate computation, the income from a single acre of pears would amount to the annual sum of five hundred dollars. And the labor attending the good management of the trees and their crop, would be less than what is usually bestowed upon many other products of the farmer's fields.

Four hundred dwarf pear trees would have plenty of room upon an acre. Under the care of a skillful cultivator, they might be made to yield a much more valuable crop than the same piece of land, in pear-rooted standards. Some writers say more than double the crop would be produced by the dwarfs. Thus the income from a single acre of fruit trees properly cultivated and managed, might easily be

made to exceed that of some entire farms. We have spoken only of apples and pears. But much might also be accomplished, even in our comparatively rigorous climate, with peaches, cherries, &c. And there is little to be apprehended from competition, even in the less difficult branches of fruit culture. We would hardly make an exception to this remark, in favor of the peach—a tree of the very easiest cultivation, in all places where it does not suffer from the severity of the weather in winter.

Yet,—and this is important—let no one hope for success in this business, unless he have taste for it, a skillful hand, and a willingness to devote himself *personally*, and with assiduousness to the work. It will not do to turn into your orchard the first straggling laborer who applies for employment. Neither can you with impunity neglect your trees, when they require the fostering hand of the cultivator.

Constant attention, patience, perseverance, and unremitting care, are just as essential to the success of an orchard, as is the soil in which it grows, or the air in which its leaves transpire.

For lack of these, perhaps nearly one half of the trees annually taken from our nurseries, are consigned to the wood-pile, within five years after they are set out; and the disappointed purchaser curses the nursery-man, his soil, the climate, and even the stars of heaven, when, in truth, only himself is at fault. What Horace said of things in general, applies with the strongest force to the orcharding business: "Life gives nothing to man, but at the price of great labor."*

Yet, if a New England farmer's son shall have been trained to habits of industry, and to a taste for these pursuits, and there shall descend to him an inheritance of a few paternal acres of thriving fruit trees, let him thank God that he was not born heir-apparent to a European Throne.

* * * * Nil sine magno

Vita labore dedit mortalibus * * *

Lib. I: Sat. 9.

CHAPTER VIII.

MONTHLY ROUTINE OF LABOR AMONG FRUIT TREES.

A chapter upon this subject may serve to remind the reader of work which he might otherwise forget, thus furnishing idle hours with profitable employment which might otherwise be crowded into more busy seasons of the year.

JANUARY.

You can work this month, during pleasant weather, pruning and scraping your orchard trees that need this care. You can cut scions, and also splice-graft little stocks previously heeled-in in your cellar, for that purpose. Trim your hardy grape-vines, if you had not time to do it last month.

Tread the snow around your standard and nursery trees, so as to keep the mice away from them.

Examine and attend to all your trees that

need labelling. Prepare a good supply of labels for another season. Pick or cut off caterpillar's eggs from your apple trees.

FEBRUARY.

Finish the uncompleted work of last month. Large trees, previously prepared, may be moved in this or in either of the two preceding months, by what is called the *frozen ball* mode. [See *Transplanting*, Sec. 3d.]

MARCH.

Prune gooseberries and currants. Graft cherries and plums, in mild days. Prune and tie up raspberries. In the latter part of this month, you may head down trees that were budded last autumn. Shorten-in peach-trees, dwarf-pears, &c.

APRIL.

Complete the unfinished work of last month. Uncover tender grapes, &c. Weed strawberry beds, and set out new beds of this fruit. Plant out also cuttings of gooseberries, currants, quinces and grapes,—the latter two in shady and favorable situations, or they will not succeed. Crack and plant plum and peach stones.

As soon as the ground and weather will permit, transplant first evergreen, then fruit and ornamental trees generally. Plant out the trees which you root-grafted in January and February. Dig around orchard-trees standing in grass-ground, in this, or in any other month in the year when you have leisure. Complete grafting cherries and plums, and commence grafting apples and pears.

MAY.

This is a very busy month. Get up early in the morning. Finish the work of last month as soon as you can. Endeavor to keep down all weeds while they are young, and thus save one-half of the labor attending this work. Cut what are called *robber-shoots** off of all budded and scion-grafted stocks, unless the bud or scion is very weak, or does not appear likely to live. Stake and tie crooked and newly set trees that need tying. Examine the peach, apple and quince, for the borer-worms that infest them. Put down layers of the quince and grape. Put your

* *Robber-shoots* are those which grow out of the stock below the bud or scion. Sometimes these ought to be destroyed gradually, if the bud or scion is weak.

horse and cultivator in motion seasonably among your nursery rows. Brush off and destroy caterpillars, early in the morning and in wet days. Attend also to your ornamental trees, plants, and flower-beds.

JUNE.

Cultivate around your trees in grass-ground. Finish the uncompleted work of last month. Thin out overbearing fruit-trees. Train grape-vines. Make war upon weeds every where. Cut off the blight from pear-trees, and the black-knot from plum-trees. Examine for borers in apple trees, &c., &c. Keep down robber-shoots on your grafted stocks. We may add, though the remark does not properly belong here, that evergreen ornamental trees may be successfully transplanted during the last week of last month, and the first ten days of this. If they suffer much loss of root in the operation, *mulch* them, and trim their tops, by shortening-in uniformly all the limbs except the top or leader. This latter, once cut off or broken, can with difficulty be restored again, even on a small tree.

JULY.

Continue your warfare upon weeds, training

the grape, cutting off blight and excrescences from trees, destroying borers, &c.

Bud cherries and plums in the latter part of this month, as soon as the buds become ripe enough for use. Attend to shortening-in dwarf pear-trees, if you prefer to do this by the *pinching-off* process, described under the head of *Quince-bottomed dwarf pears*.

AUGUST.

Put down grape and other layers, if you have not done it in the spring. Continue budding plums and cherries. Simultaneously with, and after cherries, bud pears, either on quince or pear stocks; then apples till into September. Strawberry plants *may* be set during this and the early part of next month; but, in our cold climate, it is quite as well to defer this work until spring. Apricots on plum stocks may be budded this month, on peach stocks, say about the first of September.

SEPTEMBER.

During the first week of this month bud quinces, if you wish; finish budding other trees, and then bud peaches, from the first to

the middle of the month. Remove, loosen, or re-tie the bandages of budded trees which are beginning to be girdled by them. It is an excellent practice to untie such bandages, and immediately tie them on again, more loosely. Dig holes and prepare soil for transplanting medium or large sized trees.

OCTOBER.

This is a good month for setting an orchard. Follow the directions for Autumn transplanting, and you may successfully plant out any fruit-trees of orchard size, from the latter part of this month, until they begin to leaf out in the spring,—*provided, the ground is not too wet, and the weather is not down to the freezing point.*

NOVEMBER.

Manure your trees. Top-dress strawberry beds. Lay down and cover tender grapevines, &c., &c. Small trees, layers, &c., designed for setting next spring, may be *heeled-in* deep, out of doors. Small stocks for root-grafting in winter, should be heeled-in, in a cellar, in a box of loam if you prefer, where they will not freeze. Scions *may* (if neces-

sary) be cut. Put them in a cellar, with their lower ends in the ground. Prepare large trees for moving, by the *frozen ball* method.

DECEMBER,

Complete the unfinished work of last month. If the weather is right, move and set the large trees prepared in that month.

Do work as in the month of January also. The leisure hours of this and the two ensuing months, may be very profitably employed, in reading the various horticultural publications of the day,—works which Poverty herself cannot keep out of any hands that desire to possess them.

PART II.

OF THE CULTIVATION OF THE SEVERAL SPECIES OF FRUIT TREES.

PART II.

OF THE CULTIVATION OF THE SEV-
ERAL SPECIES OF FRUIT TREES

PRELIMINARY REMARKS.

THE preceding chapters contain information upon the cultivation and management of fruit trees generally:

We now propose to enter into a particular examination of the character and habits of the several *species* of fruit trees adapted to open culture in our climate, and the proper care necessary to be bestowed upon each. In order that we may understand what are the claims of New England, as a fruit-growing country, we borrow a few words from General Dearborn, the first President of the Mass. Horticultural Society.

"Among all the fruits which are produced upon the earth, the highest position has been given to the Mangostan, which is indigenous to Java and other island in the Indian Archipelago; the second has been assigned to the Pine Apple, the third to the Orange, the fourth to the Peach, the fifth to the Grape, and the sixth to the Pear." But this is not the order

of precedence with these fruits, even in so far as they admit of out-door cultivation in the rigorous climates of the north.

The fruits of our eastern states, in the order of their comparative value, should, we think, be arranged thus,—the Apple, the Pear, the Peach, the Cherry, the Quince, the Plum, the Grape, the Apricot, the Nectarine, the Strawberry, the Currant, the Gooseberry, the Raspberry, and (we hardly know where to insert it,) the Cranberry. In this arrangement, we commence with tree-fruits and end with berry-fruits; otherwise, we should have placed the Strawberry, and, perhaps, the Currant also, between the Quince, and the Plum, where, we think, they have reputation sufficient to sustain themselves easily.

We are entering upon by far the most difficult part of our work. The writings of Thomas and Downing, and even of our nearer neighbors, Kenrick, Hovey, Manning, Ives, and others, are adapted to soils and climates differing from those of the elevated rocky regions of the interior of New England. Nor is this all. The testimony of cultivators in our most immediate vicinity, is by no means unanimous. Occupants of adjoining farms,

growing fruits for the same purposes, speak in terms of praise and condemnation of the same varieties of fruits. We have even known an intelligent orchardist to cut his scions from the same limb that another of equal intelligence, had sawed off as unworthy of cultivation. These remarks apply with more or less force to our fruits and fruit trees generally.

Something, nevertheless, may be done, and, so far as it in us lies, we shall endeavor honestly and faithfully to do this something, to the best of our humble ability.

It is important to say that many fine fruits are purposely left out of all our Descriptive Lists. Of some of these the reputation has not been sufficiently established; others have not proved uniformly productive and hardy; others have been too variable in their quality; and of others the omission has been justified by other seemingly sufficient causes.

It will be obvious to whoever reflects upon the matter, that such small lists as we have chosen to confine ourselves to, are not easily compiled. One man's family consumption, nearness to a good market, taste, fancy or peculiar whim, may be such that he will prefer to cultivate almost exclusively—say of ap-

ples—the summer or early autumn varieties. Another man differently situated, cultivating for dissimilar purposes, and aiming to gratify entirely different taste, fancy or whims, may desire to cultivate none but winter fruits. Still a third class of men may desire altogether other fruits, and so forth.

Occupants of city-gardens, having only two or three trees, would probably wish to cultivate such fruits as can be enjoyed in perfection, only when eaten directly from the tree.

Those possessing but a single tree would be able to attain this object, by having two or three such early varieties worked upon it together, trusting to the market for a supply of those fruits which have better keeping properties.

It would be desirable to extend these general remarks; but ours is a little book, and we must hasten along to other subjects.

In preparing our Lists, we have followed the Catalogue of the London Horticultural Society, as giving a greater amount of information, in a small space, than any other plan with which we are acquainted. In our particular descriptions of the quality of fruits, we have followed the mode adopted by the

American Congress of Fruit-growers. Their three grades of quality and the types or patterns of each, may be conveniently exhibited in the following little

TABLE OF QUALITY.

FRUITS.	GOOD.	VERY GOOD.	BEST.
APPLES.	Maiden's Blush.	Gravenstein.	Esopus Spitzenburg.
PEARS.	Napoleon.	Bartlett.	Seckel.
PEACHES.	Crawford's Late.	Old Mixon Free-stone.	George IV.
CHERRIES.	Black Heart.	Elton.	Black Eagle.
PLUMS.	Lombard.	Washington.	Green Gage.

Many fruits are so much affected by the season, cultivation, soil, health of the tree, &c. &c. that they, in some years, seem to belong with the *good*, and in other years, with the *very good*, or even the *best*. Thus of many it is difficult to decide, whether some should be generally classed as *good* or *very good*, and whether others generally belong with the *very good* or the *best* class.

A very explicit notion of quality, therefore, must not be expected from the following tables of fruits. We intend to give a general idea only of this characteristic, and the same also of the *size*, and, in a less degree, of all other properties and characteristics of fruits. Per-

fect accuracy, in these matters, is altogether an impracticable thing.

TABLE OF SIZE.

FRUITS.	LARGE.	MEDIUM.	SMALL.
APPLES.	R. I. Greening.	Roxbury Russet.	Golden Russet.
PEARS.	Bartlett.	Buffum.	Seckel.
PEACHES.	Early Crawford.	Early Sweet Water	Early Anne.
CHERRIES.	Black Tartarian.	Black Heart.	Black Mazzard.
PLUMS.	Washington.	Imperial Gage.	Green Gage.

We have made the above *Table of Size* on our own responsibility, and we wish it to be interpreted in the same manner as that of *Quality* above. Thus, apples about as large as the R. I. Greening, and all larger apples, will be marked with the figure 1, indicating *large*; apples *about* the size of the Roxbury Russet, will be marked with a figure 2, indicating *medium-sized*; apples about as small as the Golden Russet, and all smaller apples, will be marked with the figure 3, indicating *small*; and the same also in regard to the other fruits.

We repeat, that *perfect* accuracy ought not to be required, in regard to these things.

We will not deny that possibly we might

have selected better types of size than those included in the above table; but we thought it preferable to use such as were the most generally known.

In regard to the *Uses* of fruits, many of those marked as dessert or table fruits, are also valuable for culinary purposes; and some of the finer kitchen fruits are also esteemed for the dessert.

NOMENCLATURE.

In designating fruits, we have adopted the *general usage of our own neighborhood*, as being the best suited to our purpose, without any regard to what *may* or *may not* be standard authority elsewhere.

Unfortunately the nomenclature of fruits is still in a very unsettled condition. Whether in a country where every one *feels* so sensitively his own political importance and personal rights, an entire uniformity in this respect is attainable, is with us rather more a matter of hope than of confident belief.

CHAPTER I.

THE APPLE.

One of the good old fathers of English Pomology, some two hundred and fifty years ago, wrote,—

“I have seen in pastures about the grounds of a worshipfull gentleman, dwelling two miles from Hereford, so many Apple trees of all sorts, that the servants drink for the most part no other drink but that which is made of Apples. The quantity is such, that by the report of the gentleman himself, the Parson hath for tythe many hogsheads of cyder.

The hogs are fed, with the fallings of them, which are so many, that they make choice of those Apples they do eat, who will not taste of any but the best.”

This little item of history, without going farther back to Roman authority, shows that

the cultivation and uses of the apple are no new things under the sun. Indeed, a fruit so hardy, so productive, so easy of cultivation, coming into maturity during so many months of the year, and adapted to such numerous uses, must ever be deserving of the first attention of the orchardist.

The apple is cultivated both as a standard and a dwarf.

SECTION I.

STANDARD APPLE TREES.

Choice of a tree.—A good apple-tree for setting in an orchard, should be from about seven to eight or ten feet high, and branching out, according to the owners' taste, at any point from four to six or seven feet from the ground. The limbs ought to be well formed, diverging handsomely and equally in every direction, and they, and the trunk also, should be entirely free from moss or black canker. The length of the scions on the ends of the limbs, is a good criterion of the trees' health. The trunk ought to be straight, smooth and stocky.

The *collar*—or part of the trunk just at the surface of the ground—should be free from the appearance of borers. The root ought to be well formed and, like the top, diverging equally in every direction, having a plentiful supply of fibres, particularly in its outer portions.

One must not expect to find all these desirable qualities combined in every tree that he raises or purchases; and of course they are not all essential;—but the purchaser should always unite as many of these good properties as he can.

Soil.—The apple will thrive in any deep, rich soil, except the very dry or very wet. “A strong loam of a calcareous nature,” says Downing, “is its favorite soil, in all countries.” Kenrick recommends “a deep pan soil rather moist than dry;” Thomas, “Such soil as will give good crops of Indian corn.” Hill-sides are very much preferable to plains. Rocky hills, too steep or rough for other cultivation, may be converted into profitable orcharding.

If the soil is damp and low, the trees should be set somewhat higher than they stood in the nursery. The trees may even be placed directly upon the surface of such grounds, and sufficient soil carted around them to cover their roots properly. But it is much better to dig holes, two or three feet deep, and put into them a drainage of cobble stones, brick-bats or other rubbish.

On the contrary, if an orchard is to be set

out upon very dry land, plant the trees quite as deep as they grew in the nursery, and give them a rich, generous soil around their roots, and a heavy mulching also. We cannot impress it too strongly upon the reader's mind, that *drainage* is necessary in quite moist land, and that a *deep, rich fertile soil* is essential to the success of an orchard, wherever it may be situated.

Distance.—Apple-trees may be set for a limited time, say fifteen feet apart; and, when they become half grown, every second row each way may be removed to some other place, leaving the remaining rows thirty feet apart each way. Full grown apple-trees require to stand from thirty to forty feet apart, and this is the proper distance for setting a permanent orchard.

Transplanting. We have already given all necessary directions for transplanting trees. The apple will bear more abuse in the planter's hands, than some other trees. But, by all means, let this work be done well, or not at all; for an extra half hour's labor, and twenty-five cents' worth of rich soil at setting, will be re-paid to the planter an hundred fold in the improved growth and healthiness of the trees.

Cultivation. We have stated, in the first chapter of our little work, that a fine fruit-tree is the combined product of nature and human skill. It is not enough therefore to select a good apple-tree, and to plant it out in the best manner. A great deal of further care must be bestowed upon it. The caterpillar and the canker-worm must be guarded against or destroyed; the famishing mouse must not be suffered to gnaw the trunk under the friendly shelter of the snow-crust; and the insidious borer must be made to understand that his *intrusions* are not to be tolerated. Moss should neither be permitted to overgrow the trunk and limbs, nor a thick grass-sward to bind itself around the tree and absorb the moisture of the earth about its roots. We have already given general and sufficient directions upon this subject. It should be remembered that the apple-tree will always be abundantly grateful for a deep rich soil, and generous cultivation. Cattle ought never to be turned loose into an orchard, unless one wishes to destroy it. If it is not desirable to *cultivate* the whole orchard, cultivate a circle around each tree, say quite as many feet, as the tree is inches, in diameter, and let the rest of the field be mowing-land.

Pruning. Whenever the apple needs heavy pruning, the work may be performed at any time from the latter part of autumn till early in the spring. Light pruning may be done at the same time, or it may be *advantageously* deferred till the latter part of June. The apple, once properly formed in the nursery, needs little further pruning, except to remove suckers, and dead limbs, (which always ought to be taken off,) and occasionally also a limb that is growing so as to deform or crowd the head of the tree.

DESCRIPTIVE LIST OF APPLES.

Nearly fifteen hundred varieties of the apple have been tested, in the garden of the London Horticultural Society, and several hundred also in this country.

Instead of this formidable, worthless catalogue, we propose to describe only twenty-eight varieties—all of which we *know* to be here unimpeachably excellent fruits.

We have numbered and described them *nearly* in the order of their ripening. This, as we have before remarked, cannot be done very accurately, for reasons already stated; and, further, because several ripen simulta-

neously; some also ripen gradually, while others ripen suddenly, and are quickly gone. Some, more than others, are hastened or retarded in their approach to maturity, by the state of the weather in different seasons, &c. &c.

For size, quality, &c., see the *Preliminary Remarks* to Part II. of this Book.

DESCRIPTIVE LIST OF APPLES.

ABBREVIATIONS.

Size.—1, large; 2, medium-size; 3, small.

Quality.—g, good; v. g. very good; b, best.

Use.—T, table; K, kitchen; T K, both uses.

Season.—Jan. January; Feb. February; Jan. Feb. both months.

Color.—b, brown; d, dark; g, green; p, pale; r, red; rus. russet; sc. scarlet; str. striped; y, yellow; crim. crimson.

Form.—Oblate means flattish; ovate means egg-shaped; pearmain-shaped means like a flattened cone; calville-shaped means having ribs extending from the stem to the blossom-end; con. conical.

Remarks.—P. productive; V, very; J, juicy; B, beautiful; H, hardy tree.

OR	NAME.	SIZE	QUAL.	USE	SEASON.	COLOR.	FORM.	REMARKS.
1	Early Harvest, . . .	2	b.	T	July, Aug.	p. y.	roundish	V. P. small tree. Best early apple
2	Early Strawberry, . .	3	b.	T	July, Aug.	d. r. str.	roundish	V. P. B and perfumed
3	Early Sweet Bough, .	2	v. g.	T K	Aug.	p. greenish y.	oblong ovate	V. P. small round headed tree, fine
4	Sapson,	3	g.	T	Aug. Sept.	crimson str.	roundish	V. P. flesh stained with red stripes, ripens gradually
5	Williams's Early Red,	1	b.	T	Aug. Sept.	d: r.	roundish oblong	V. P. B. ripens gradually
6	Pumpkin Sweeting, . .	1	v. g.	T K	Sept.	y. rus.	roundish oblate	Strong upright tree
7	Mexican,	2	b.	T	Sept.	str. r.	roundish	P. tree grows very slow

8	Porter,	1	v. g.	T	Sept. Oct.	y.	conical	V. P. first rate in every re- spect
9	Fall Pippin,	1	b.	TK	Sept. Oct.	y. g.	round oblate	V. popular
10	Lyscom,	1	g.	TK	Oct.	g. y. r.	oval	V. P. esteemed
11	Malden's Blush,	2	g.	TK	Oct. Nov.	y. r. cheek.	round oblate	V. P. and B. tree grows rapidly
12	Capron's Pleasant,	1	v. g.	T	Oct. Nov.	g. y.	roundish	P. a fine Worc. Co. seed- ling
13	Gravenstein,	1	b.	T	Oct. Dec.	r. str.	roundish	Tree vigorous and bears young
14	Mother,	1	b.	T	Oct. Jan.	y. deep r.	round oblong	P. Worc. Co. seedling
15	Leland's Spice,	1	b.	T	Oct. Jan.	y. r. crim. str	round con.	V. P. and B. first rate in every respect
16	Tift Sweeting,	3	b.	T	Oct. Jan.	y. rus.	round	P. small tree, needs high cultivation, fruit v. rich
17	Vandevere,	2	v. g.	T	Nov. Jan.	y. r. str.	flattish	Requires a rich sandy soil
18	Hubbardston Nonesuch,	1	v. g.	T	Nov. Feb.	y. str.	conical	V. P. and B. handsome tree
19	Esopus Spitzenburg,	2	b.	TK	Nov. Feb.	lively r.	oblong	P. exquisite vinous flavor
20	Yellow Bellflower,	1	v. g.	T	Nov. Feb.	y. little r.	oblong	P. tree vigorous, needs warm sandy soil
21	Peck's Pleasant,	1	b.	T	Dec. Feb.	g. little r.	round oblate	Tree grows moderately but bears regular and well
22	R. I. Greening,	1	b.	TK	Nov. Mar.	g. y.	round oblate	V. P. H. very valuable
23	Baldwin,	1	b.	TK	Dec. Mar.	y. r. str.	roundish	V. P. and B. first rate for shipping
24	Honey Greening,	2	v. g.	TK	Jan. Mar.	g.	round oblong	V. P. good keeper
25	Nonesuch,	1	b.	T	Dec. April.	d. r.	roundish	Excellent, sometimes cracks
26	Canadian Reinette,	1	v. g.	T	Dec. April.	g. y. rus.	con. flat ribbed	P. not well known, v. fine
27	Danvers Wint. Sweeting,	2	v. g.	TK	Jan. April.	y. little r.	round oblong	V. P. tree grows rapidly
28	Roxbury Russet,	2	b.	T	Feb. June.	y. rus.	round oblate	P. dislikes a cold soil

The list just given comprises twenty-eight varieties of the apple. For general cultivation in the interior of New England, we consider this the best list of that number of varieties of which the reputation is as yet well established. We have prepared it with a great deal of care, and have confidence that it will prove satisfactory to the fruit-growing public who consult it.

Crab Apples are sometimes desirable for preserving, &c. The best two are the Yellow Siberian and the Red Siberian. If any one prefers that these should be of a dwarfish size, he should select trees that have been worked upon paradise stocks.

Those who would go beyond the limits of the above descriptive list, can select from the following :

Summer Apples,—Astracan, Benoni, River (a capital fruit, but the tree is a very poor bearer,) &c. &c.

Autumn Apples,—Duchess of Oldenburg, Foundling (or Shirley,) Fameuse, (Red) Hamburg, (*for cooking*,) &c. &c.

Winter Apples.—American Golden Russet (very fine,) Minister, Jewett's Fine Red, Blue Pearmain, Seaver Sweeting, Dutch Mignonne,

(perhaps) Northern Spy, Lady Apple (very pretty and also very small,) Sutton Beauty, Rockport Sweeting, Black Gilliflower, Sweet Russet (fine for baking,) &c. &c.

SELECT LIST of twelve varieties.—We submit the following:—*Summer*—Early Harvest, Early Sweet Bough, Williams's Early Red. *Autumn*—Porter, Leland's Spice, Gravenstein. *Winter*—Hubbardston Nonesuch, R. I. Greening, Baldwin, Esopus Spitzenburg. *Spring*,—Danver's Winter Sweeting, Roxbury Russet.

SELECT LIST of six varieties.—*Summer*—Williams's Early Red. *Autumn*—Porter, Leland's Spice. *Winter*—R. I. Greening, Baldwin. *Spring*—Roxbury Russet.

A single Apple-Tree for a city garden, might be grafted with three sorts, viz: Williams's Early Red, Porter, Leland's Spice;—being thus limited to a single tree, it would be better to buy later varieties.

SECTION II.

DWARF APPLE-TREES.

No one, we suppose, will attempt to cultivate these little trees in this country, excepting for ornamental purposes. They are very pretty garden pets in the midst of a flower-bed, or at the corners of alleys, or elsewhere where fancy may locate them. They seldom bear more than a dozen or twenty apples, and therefore the economical orchardist, looking to profit alone, ought not to consider them as worthy of his attention. To form these dwarfs, set grafts of such apples as you desire into what are called *Paradise*, or by the French, *Doucin* stocks.* These stocks are of rather a tender habit, and they require kind treatment, and a generous rich soil. Where a number of these trees are planted together,

* The *Paradise* is a distinct kind of apples. Its stocks are raised, in Europe, from suckers or from cuttings and layers.

they may be set three or four feet apart. They are subject to the same diseases and depredations of insects to which apples on *free stocks* (i. e. apple seedling stocks) are liable. There is nothing very peculiar in the management of the dwarf-apple. Its place is the garden, not the field; still less will it answer to put these little trees in grass-ground, or to subject them to rough usage.

Very large sized apples, such as the Twenty Ounce and the Gloria Mundi; fine looking apples, such as Leland's Spice, the Lady Apple, Maiden's Blush, Siberian Crab, &c., are pretty for this mode of cultivation.

SECTION III.

INSECTS, DISEASES, &C.

The insect-enemies of the apple are chiefly the Caterpillar, the Cankerworm, the Borer, and the Appleworm.

1. *The Caterpillar.* Several species of this insect prey upon the apple leaf; but the common caterpillar which is hatched and comes out just as the leaves begin to expand, is the pest of the orchard, unless it is promptly destroyed.

The character and habits of this insect are too well known to require a description here.

By far the most effectual way of destroying them, is to pick off their eggs any time from autumn till the last of April. These will be found on the outer parts of the tree, just at the base of the young wood of the previous summer's growth. They may be taken off with the fingers, or cut off with a pruning knife or the pole-shears, which we have described under the head of Implements. (*See page 116.*)

The eggs are deposited in cylinders, or rings, about half an inch wide, presenting the appearance of a small quantity of brown wax encircling the twig. When taken off with the fingers, they separate easily and leave the twig entirely clean.

If this work has been neglected, other means must be resorted to for destroying this insect. A caterpillar-brush affixed to a pole, is the best of these. Go among your trees, early in the morning or in a wet day, when the vermin are all in their nests, and you can easily wipe them off with your brush, before they shall have done any injury.

2. *The Canker-worm.* Whole orchards in New England have been destroyed by the ravages of this insect. Happily it does not make its visits every year, but only after long intervening periods,—making its appearance gradually from year to year until in the third or fourth summer, the orchard will appear as if it had been burnt over with fire.

Whenever the ground is not frozen, from the first of November till the middle of May, the female of the canker-worm crawls up the trees to lay her eggs. The most effectual way to prevent her ascent that we are acquainted with, is *to tar* the trees.

With this design, says Kenrick, the bark around the circumference of the trunk is scraped smooth, and the crevices in it where the application is to be made are filled with clay or mortar. Over this a strip of canvass, three or four inches wide, is bound around the tree, the lower band consisting of a large tow cord, to prevent the running down of the tar and its consequent injurious effect on the tree. On this strip the tar is laid with a brush. The tarring ought to be applied, every afternoon toward sunset when the weather is moderate and the ground unfrozen, from the first hard frosts in October till the latter part of May. A small portion of soft grease may be mixed with the tar to preserve it from drying, and in this way it will answer to visit the trees every other day. Some farmers apply the tar directly to large trees without the canvass, and we have not seen any injury resulting from the practice. Tarring two years in succession in the months of March and April has entirely rid orchards of this pest.

Downing says, old India Rubber, melted in an iron vessel over a very hot fire, forms a very adhesive fluid, which is not effected by

the weather, and is preferred by those who have tried it, as being a more convenient and serviceable article than tar, for smearing the bandages.

It is hardly necessary to say that the object of the tarring process, is to stop and entrap the female in her ascent to lay her eggs. It will readily be seen therefore that the omission of a single night favorable to the movements of the grubs, may prove fatal to the remedy for that season, and defeat the whole object of the labor previously bestowed. (*Kenrick.*)

Various other methods of destroying this insect have been tried, but with only partial success. The above described mode, faithfully followed, we have known to be attended with perfect success.

3. *The Borer.* This insect enters the tree, chiefly from an inch or two below, to a foot above the surface of the ground; but sometimes even as high up as the branches. The eggs are laid, from the last of April till into June. Upon small trees, an effectual preventive consists in washing the parts of the trunk exposed to attack, with a solution of one pound of good potash dissolved in about four or five quarts of water. A small conical

mound of ashes, leached or unleached, put around the tree in the spring, sometimes affords them sufficient protection. A wrapper of brown paper previously saturated with strong tobacco water, would doubtless prevent the insect from depositing its eggs.

The presence of the borer already in a tree, is indicated by the dust, (resembling a spoon-full or more of saw dust,) which he ejects from his hole. If taken early, you may destroy him with the point of a knife. When he is farther in the wood, use a flexible barbed wire, with which to extract him or punch him to death. A good ear will be able to *hear* the success of the latter operation.

4. *The Apple-worm.* This insect frequently destroys or greatly injures more than one half the entire crop of a tree. Thomas says the best preventive is to allow swine to eat the wormy fruit, as fast as it falls, thus destroying the enclosed insects and preventing their spread. A quart of salt sprinkled over the ground under a large tree each year, will be found to diminish the number of these insects, and add also to the health and productiveness of the tree. In all your warfare with insects, do not forget that a *prompt, early movement is nine tenths of the victory.*

5. *The Woolly Aphis.* This insect, (*Aphis langinera*,) called erroneously in Europe the *American Blight*, has as yet rarely made its appearance in this country. In France and Germany, and in other parts of Europe, it is the pest of the orchard.

The appearance of this insect is like a small quantity of down or white frost, in the forks and crevices of the twigs and branches. This, examined with a glass, proves to be composed of an immense number of woolly lice. If not destroyed, they will increase very rapidly. Fortunately the remedy is an easy one. Loudon says it is only necessary to wash the affected parts, with diluted sulphuric acid—one ounce by measure of the sulphuric acid of the shops, mixed with ten ounces of water. This liquid should be applied, by means of a piece of sponge or rag tied to a stick, the operator taking especial care not to get it upon his hands or clothes. One application of it, assisted by the disseminating powers of the next succeeding rain, will effectually destroy these insects.

We noticed a slight appearance of the woolly aphis in the nursery last summer.

Black Canker. The trunk or limbs of trees, affected with this disorder, should have the diseased, black outer bark carefully shaved off, in the month of June; after which apply a generous coating of the gum-shellac composition, described in the Chapter on *Pruning*. We have practiced this with great success.

Blight.—Apple-trees are sometimes affected by a disease, similar to what is called the *Pear Blight*. For a description of the disease and the best known preventives and remedies, see the Chapter on *The Pear*.

Bearing year. In common management, this takes place each alternate year. By thinning out half the blossoms on the bearing year, you may easily have about an equal quantity of fruit, every season. The bearing year may be entirely changed, by taking off all the blossoms or young fruit on that year, and allowing them to remain, on the year which we wish to make the bearing one.

We have a fine Baldwin, one limb of which was several years ago struck by a frost, while in full blossom. When the other parts of the tree are loaded with fruit, this has none at all. On the alternate years, this bears two or

three bushels of fine apples, while there are scarcely as many single specimens, on the whole of the rest of the tree. What nature did in this case, art may easily effect upon other trees.

SECTION IV.

GATHERING AND RIPENING THE APPLE.

The following remarks are intended, chiefly, to apply to winter varieties of the fruit.

Mr Pell, the great orchardist of Ulster Co., N. Y., recommends to gather the apples carefully by hand on a dry day; lay them gently by hand twelve or fourteen inches deep on the floor of a cool dry room, and let them dry and season there, for three weeks. Then carefully take them up, on a clear day, and pack them by hand, in clean dry barrels, filling the barrels so full that a gentle pressure will be necessary in order to head them up. In this way they may be kept without rotting, and safely sent to any part of Europe, or the West Indies. (*Genesee Farmer.*) Smaller quantities of apples may be put up, in common, tight, wooden buckets. The best place for keeping them, is a dry airy room or cellar, of which the temperature ranges from 35° to

45° *Fahr.* Thomas recommends packing alternate layers of apples and dry chaff mixed with a small portion of dry, pulverized lime. Apples for exportation are often wrapped each one separately in clean soft coarse paper like oranges, and then put up, in boxes or barrels as above directed.

The common practice with our best orchardists here in Worcester, is to gather winter apples, during the last week in September, generally.

The fruit is taken from the tree, when it is not moist with dew or rain ; it is at the same time assorted and carefully placed directly in clean, dry, tight flour barrels. The barrels, when filled, are placed on the north side of a fence or building, or in some other cool, shady out-door situation, and then covered with boards, in such a manner as to keep out the rain and cold. Here they are left, until the danger of freezing requires them to be removed into a cellar. The best fruit cellar is one which is dry, airy and of a uniform temperature of about 40° *Fahr.* Fruit will very soon decay in a close, damp cellar, particularly if the cellar is also warm. Late-keeping apples, like the Roxbury Russet, should be

headed-up in the barrels, as soon as they are gathered, and it is not well to open them, until the latter part of winter, unless they are wanted for use sooner.

SECTION V.

USES OF THE APPLE.

We shall treat of this topic quite summarily, lest we trespass upon ground already occupied by the numerous Cook Books and Kitchen Guides, with which species of literature the public has been so plentifully supplied.

Uses of the Pulp. From the first of August, for ten or twelve months, the finer sorts are extensively used for the dessert.

In the kitchen it enters largely into the composition of numerous articles of food, sauces, jellies, pies, tarts, &c. &c. It is boiled in dumplings; and it is roasted for the sick. *Apple-Butter*, or apple-sauce, is a common side dish upon every farmer's table.

Dried Apples are also much used for pies, puddings, &c. Good preserves may be made of this fruit. The pulp of the apple mixed

intimately with lard, constitutes the pomatum used by perfumers.

Sweet apples especially, and even sour ones, are a valuable crop to cultivate for feeding swine or cattle. Some intelligent farmers consider them quite as valuable as potatoes, for this purpose.

For milch cows and other cattle, and for swine, we believe trees bearing sweet apples might be made far more profitable than any of the cider orchards ever were; to say nothing of the *moral* benefits which every farmer would derive, from feeding to his four-footed hogs, what he formerly was sometimes wont to employ as a means of making a two-footed hog of himself.

Uses of the Juice. The juice of the apple is called Cider. Cider is commonly made of the refuse apples of the orchard, mixed together. But to make the best cider, use mellow sweet apples only. Grind them finely in a clean mill, let the pomace lay in the trough of the mill, two or three days or even a week, if it can be without fermentation. This gives a fine color, and a peculiarly rich, saccharine flavor to the liquor, not otherwise obtainable.

Strain the liquor, as it comes from the press,

through hair cloth or fine wire sieves, and put it up, into clean, tight barrels, or hogs-heads. These being filled full, and the bung left out, are placed in a cool airy cellar. As fast as the cider *works* over, replenish the barrel. When it has done *working* or fermenting, rack it off carefully into another barrel. Let it have opportunity to *work* a second time, if necessary, and then rack it off again. It may now be put into bottles or tight barrels, and be kept for use. Bottled cider may be kept, and will improve for years, like wine. Fill the bottles up to their necks, cork them tightly, and lay them on their sides in layers of sand, in a cool cellar. It is an excellent plan to seal them with wax. Cider is generally made, with much less labor than we have just described. Nine tenths of the cider made in New England, is probably not racked off at all from the barrels in which it was first put at the mill. Once racking, we suppose, would generally answer for all ordinary purposes.

From sweet cider, molasses may be made, by evaporation; and from this molasses, sugar may be produced. A barrel of cider, standing out doors in summer with the bung out,

will turn into vinegar. Sweet-apple cider is by far the best for all these uses.

Sweet cider may be boiled away, over a slow fire, and afterward carefully put into a clean cask, where it will keep well for a long while. This boiled cider is very useful in preparing pies &c. Cider is sometimes greatly strengthened, by freezing it; the better part of it resists the action of the frost, and may thus be separated from the inferior, watery particles.

CHAPTER II.

THE PEAR.

“If the long period of nearly ten months,” says General Dearborn, “during which the numerous most admired varieties of the pear are successfully matured for our tables, is taken into consideration, with the diversity of graceful forms, beauty of color, agreeable aroma and delicious flavor of many of them, it may, with propriety, be placed at the head of the list of fruits, in all the states where the orange cannot be cultivated.”

The pear is the favorite fruit of the more intelligent and scientific cultivators of the present century, and its finer qualities have in consequence been wonderfully developed within the last sixty or seventy years. But the passion for new varieties—amounting almost to a mania with some distinguished horticulturists—has retarded rather than accele-

rated the general dissemination of the most *truly valuable* kinds of the fruit.

The pear—so difficult to raise here from the seed—when once it has become a well-rooted plant of three or four years' growth, and as many feet in height, is a fruit tree of easy cultivation, of great hardihood and productiveness; it is subject to few diseases, and often attains to a great age.

A pear tree in Illinois, on the authority of Rev. H. W. Beecher, produced in 1834, while yet not over forty years of age, a crop of *one hundred and eighty-four bushels of pears!* An English writer mentions a pear tree in Herefordshire, Eng., from which *fifteen hogsheads of perry* were made in a single year. This tree covered more than half an acre of ground, the branches bending down and taking root, and, in turn, producing others in the same way.

M. Bosc, mentions several pear-trees in Europe, which are known to be nearly four hundred years old. (*See Downing's Fruits and Fruit Trees.*)

It is somewhat remarkable that the states of Massachusetts and New York have each a patriarchal pear-tree still standing in memory of their early colonial governors.

The old *Endicott* pear-tree—which may be seen from the cars of the Essex Rail Road, as they pass through the town of Danvers in this State—now numbers more than two hundred and twenty years. It still rears its head where it was planted by Gov. Endicott, and bravely stretches forth its vigorous arms, dropping the autumn fruits of its green old age into the bosoms of a distant posterity.

The *Stuyvesant* pear-tree, planted by Gov. Stuyvesant of the Dutch colony of New York, more than two centuries ago, was very recently—if it is not now—standing, healthy and productive, in the upper part of what was then the city of *Nieuw Amsterdam*.

The pear-tree is extensively and profitably cultivated in this country, both as a standard and a dwarf. With high cultivation, and very careful and judicious management, a larger crop and also much more valuable specimens of the fruit might be produced from an acre of dwarf pear-trees, than from one of standards.

SECTION I.

STANDARD PEAR TREES.

Choice of a Tree. A good standard pear-tree for orchard planting, should be from five to eight feet high, and not larger, unless it has been previously re-set, once or twice, when of the height of three to seven feet; for the roots of the pear are not abundantly supplied with fibres, and large trees of it cannot therefore be safely moved, the first time, without very great care.

The tree should branch out at a point to suit one's fancy, from about four to six feet above the ground, according to its general size. The top ought to be well balanced, diverging outward and upward, so that the head of the tree may appear to promise to grow in a somewhat conical or pyramidal form. Every part of the trunk and limbs should be free from moss and black canker. The length of

the last season's growth is a good evidence of the health of the tree. The trunk should be straight, smooth and stocky. The root ought to be well shaped, neither one-sided, nor very destitute of fibres. As in purchasing apple-trees, one must not expect to have all these good qualities combined in every pear-tree he obtains from a nursery, but the purchaser should always endeavor to unite as many of them as he can, even though he should be compelled to pay a greater price for the trees.

Soil. "The best soil for the pear," says Downing, "is a strong *loam* of moderate depth on a dry subsoil." Kenrick recommends "rich soils and gentle declivities, not moist situations." Thomas advises the same soil as for the apple. On a cold soil with a clayey subsoil, the trees are stunted and short-lived, and the fruit is of an inferior quality. We should prefer a deep, rich sandy loam on a dryish subsoil,—such land as would produce eighty or a hundred bushels of Indian corn to the acre. For setting the pear on damp or very dry soils, see observations in the chapter on *The Apple*. If the subsoil is heavy clay, it will be better to cultivate dwarf pears only, unless the places for the pear-root-

ed trees have been prepared, by digging large deep holes, and filling them with rich, sandy loam, having a drainage underneath.

Distance. Pears may be set, for a term of years, at a distance of ten to twelve feet apart each way. When they are half grown, take out every alternate row each way, and the remaining rows—twenty to twenty-four feet apart—will be at the proper distance for a permanent pear orchard. An entirely safe mode of removing the trees of these alternate rows, is described under section 3d, of the chapter on *Transplanting*. The peach and the pear may be thus set alternately, and the former will be dead and gone, before the latter will need the space occupied by it.

Transplanting. The pear is a more costly tree than the apple, and it will not bear so rough treatment; we therefore advise to be careful in transplanting it. We have already given sufficient directions for performing this work. (*See the Chapter on Transplanting, and also that on the Apple.*)

Cultivation. Observe the same directions as those given in the chapter on *The Apple*. Read also what is said under the head of Root-pruned dwarf-pears. Wood ashes, bone

dust, and a very small quantity of pot-ash dissolved in water—say two or three lbs. to a cart load of other manure—are fine fertilizers for the pear.

Pruning. The standard pear requires less pruning than any other fruit tree. Whatever applications of the knife may seem necessary, may be guided by the directions given in the chapter on *The Apple*.

Duration of Varieties, &c. Some theoretical writers both in Europe and in this country, have maintained that the older varieties of the pear—and also of other fruit-trees—are deteriorating; that through the infirmities of age many of them have become, and others are gradually becoming unworthy of cultivation. It is certainly true, that many of the fine old pears have in some localities neither the appearance nor the flavor that they once had. But neglected cultivation, diseased stocks, bad soils, unfavorable climates, etc., have most probably done the mischief which has been lamented as the effects of old age. And this is the opinion of Professor De Candolle, one of the most distinguished physiologists of the present century. And further, it has been ingeniously main-

tained that a *bud* inserted upon a thrifty stock, is essentially the same thing for practical purposes as a *seed* planted in the ground. If this be true, let us hope—at least till we have better evidence to the contrary—that our finer sorts of pears and other fruits may continue to be among the luxuries of rural life, so long as “the earth bears a plant, or the sea rolls a wave.”

DESCRIPTIVE LISTS OF PEARS FOR CULTIVATION ON STANDARD TREES.

The general remarks introductory to this part of our work and also to our Descriptive Lists of Apples, would be appropriate here.

As with the apple, a similar diversity of opinion prevails in regard to the comparative merits of many varieties of this fruit; the different purposes for which one may wish to cultivate it,—for his own use, for market, for exhibition, &c. &c.—are even more numerous; and there is as great a number of kinds from which taste, fancy or whim may make a selection.

Seven hundred varieties of the pear have been tested, in the experimental garden of the

London Horticultural Society ; and, at the Twentieth Annual Exhibition of the Mass. Hort. Society, two hundred and sixty sorts were exhibited, from the Pomological Garden at Salem in this State. As in the lists of apples, we shall present no such frightful catalogues, to confuse and perplex those who may do us the honor to consult our pages. If one of the most extensive cultivators of the pear in America could not furnish Downing with the names of more than twenty varieties of *unvarying* and *unquestionable* excellence, surely thirty or forty varieties will be deemed sufficient for so small a work as ours. We arrange and number the pears in the lists, *about* in the order of their ripening. But as with other fruits, some ripen contemporaneously ;—some ripen nearly all at a time, while others ripen gradually for several weeks. The soil and location also have considerable effect upon the time of a fruit's maturity, particularly of the pear.

For Tables of Quality and Size, &c., see the *Preliminary Remarks to Part II.*

DESCRIPTIVE LIST OF PEARS.

ABBREVIATIONS.

SIZE.—1, large; 2, medium-size; 3, small.
QUALITY.—g, good; v. g. very good; b, best.
USE.—T, table; K, kitchen; T K table and kitchen.
SEASON.—Jan. January; Feb. February; Jan. Feb. both months.
COLOR.—p, pale; y, yellow; b, brown; d, dark; g, green; r, red (meaning on the sunny side); rus. rus. set; str. striped.

Form.—pyr. pyriform, or long pear-shaped; obov. obovate, or egg-shaped, with stem in small end; turb. turbinate, or shaped like a top, as Dearborn's seedling; r, roundish; reg. regular.
REMARKS.—P, productive; V, very; J, juicy; B, beautiful; But. buttery; Ast. astringent; S, sometimes; cr. cracks.

NO.	NAME.	SIZE	YIELD	SEASON.	COLOR.	FORM.	REMARKS.
1	Madeleine,	2	v. g.	July, Aug.	p. y. g.	ob. py.	Tree fruitful and vigorous; best of its season
2	Jargonelle,	1	g.	Aug.	g. y.	long pyr.	V. P. tree vigorous, of straggling pendant habit
3	Bloodgood,	3	b.	Aug.	y. rus.	obov. turb.	Tree V. slow growing, but P.
4	Dearborn's Seedling,	3	v. g.	Aug.	y.	regular, turb.	V. P. grows in every soil.
5	Bartlett,	1	v. g.	Aug. Sept.	y.	irreg. pyr.	Tree upright, V. P. bears young
6	Rostrezer,	3	b.	Aug. Sept.	y. g. r.	oblong pyr.	Tree vigorous, and V. P. fruit first rate
7	Andrews,	1	b.	Sept.	y. g. r.	pyr.	Tree V. hardy, bears young V. variable
8	Beurre d'Amalis,	1	v. g.	Sept.	g. y. rus.	irreg. obov.	V. P. handsome and good, crooked growing tree
9	Golden Beurre of Bilboa,	1	b.	Sept.	golden y.	reg. obov.	Tree V. P. fruit V. B. and excellent
10	Paradise d'Antonne	1	b.	Sept. Oct.	y. rus.	pyr.	Exquisite flavor, tree grows fast

11	St. Ghislain,	2	b.	T	Sept. Oct.	y.	pyr.	Tree V. upright and beautiful, fruit S. variable
12	Heathcot,	2	v. g.	T	Sept. Oct.	p. g. y.	reg. obov.	Tree V. P. and hardy
13	Fondante d'Antonne,	2	b.	T	Sept. Oct.	y. g.	obov.	Tree grows well and is P.
14	Buffum,	2	v. g.	T	Sept. Oct.	y.	oblong obov.	Tree V. P. strong, hardy, & extremely ornamental
15	Seckel,	3	b.	T K	Sept. Oct.	d. y. b. r.	reg. obov.	Tree stocky, V. P. and hardy, needs high cultiv.
16	Flemish Beauty,	1	v. g.	T	Sept. Oct.	y. rus. r.	obov.	Tree luxuriant, V. P. and bears young
17	Henry Fourth,	2	b.	T	Oct.	p. g. y.	round pyr.	Tree hardy, over bears
18	Fulton,	3	v. g.	T	Oct.	d. rus.	r. flattish	Tree V. P. and hardy
19	Louise Bonne de Jersey,	1	v. g.	T	Oct.	p. g. r.	pyr.	Tree P. and hardy
20	Urbaniste,	1	b.	T	Oct. Nov.	p. y. rus str.	obov. pyr.	V. P. does not bear V. yn'g
21	Beurre Bosc,	1	b.	T	Oct. Nov.	d. y. rus.	pyr.	Tree not V. P.
22	Marie Louise,	1	b.	T	Oct. Nov.	y. rus.	oblong pyr.	Tree P. but crooked grower, hardy
23	Dix,	1	b.	T	Oct. Nov.	y. rus.	long pyr.	Tree hardy, V. P. but not P. when yn'g, try root pin'g
24	Coffin's Virgalleu,	2	g.	T K	Ncv.	y. rus.	obov. turb.	Tree hardy and V. P. J. capital market pear
25	Beurre Diel,	1	v. g.	T	Oct. Dec.	y. rus.	obov. pyr.	Tree V. strong and vigorous
26	Vicar of Winkfield,	1	v. g.	T K	Nov. Dec.	p. y.	long pyr.	V. P. and hardy vigorous tree, ex market pear
27	Lewis,	3	v. g.	T	Nov. Dec.	p. g. rus.	obov.	Tree vigorous, drooping, over tears
28	Columbia,	1	v. g.	T	Dec. Jan.	g. y.	reg. obov.	Tree stout upright and V. P. but S. winter kills
29	Beurre d'Aremberg,	2	b.	T	Dec. Feb.	p. g. y.	obov.	V. P. fruit easily ripened
30	Winter Nellis,	3	b.	T	Dec. Feb.	y. g. rus.	round obov.	Tree hardy and P. fruit is V. first rate
31	Lawrence,	1	v. g.	T	Nov. Mar.	p. y. g.	obov.	Tree grows modr'y, but is V. P. and's further trial here

We have given in our General List thirty-one varieties of the pear which we deem the most valuable for one's own consumption or for the New England markets.

If any person desires a more extended catalogue, he may select from the following:—

Summer—Julienne, Muscadine, Passans du Portugal (fine,) Summer Franc Real, Williams's Early.

Autumn—Dunmore, Napoleon (better on quince,) Sieulle, Thompson's, Surpasse Virgallieu, Verte Longue, Bezi de la Motte, Beurre de Capiaumont, Beurre d'Anjou, Doyenne Boussock; (the latter two do well on quince.) Also, (worthy of trial,) Swan's Orange.

Winter—Glout Morceau, Knight's Monarch, Prince's St. Germain. *Winter Baking Pears.* The Iron or Black Worcester, Catillac, Bell or Pound, are the best cultivated in New England.

We now propose a select list of fourteen pears, which we hope may prove satisfactory to those whose ambition is for *the truly valuable* rather than for a multiplicity of varieties.

SELECT LIST. *Summer.*—Madeleine, Bartlett, Rostiezer.

Autumn—St. Ghislain, Buffum, Louise Bonne de Jersey, Henry IV., Seckel, Flemish Beauty, Urbaniste, and Dix.

Winter—Vicar of Winkfield, Beurre d'Aremberg, Winter Nelis.

SMALLER SELECT LIST of seven varieties.

Summer—Madeleine, Bartlett.

Autumn—L. Bonne de Jersey, Seckel, Dix.

Winter—Vicar of Winkfield, Winter Nelis.

STILL SMALLER LIST of three varieties.

Summer—Bartlett. *Autumn*—Flemish Beauty. *Winter*—Vicar of Winkfield.

Those wishing but a single tree, would do well to have it grafted with one or all of the last three named varieties; in the latter case, putting the Vicar on the top of the tree, and the others lower down.

The Bartlett has attained a greater popularity in the United States, than has been acquired by any other variety of the pear. This is owing to a *combination* of valuable properties which it possesses. The hardihood and early productiveness of the tree, the facility with which it adapts itself to different soils, its fine growth and general health, etc., together with the large size, beautiful appearance and good flavor of the fruit, have earned it a reputation among its brethren, the right to which several rivals are already beginning to contest.

SECTION II.

DWARF PEARS.

The pear may be advantageously cultivated as a dwarf. Indeed, this is almost the only mode in which the fruit is raised for the markets of Paris. And in this country, *quince-bottomed* pear trees are coming into extensive favor with those who have had experience in managing them. *Root-pruned* dwarfs are less cultivated, but chiefly, we suppose, because the manual operation and effects of root-pruning are as yet but very little known in this country.

Amateur cultivators may amuse themselves in rendering the pear still more diminutive, by working it upon the common white thorn, or the mountain ash. The point of grafting should be just under the surface of the ground. By commencing early with the root-pruning process already described, these little dwarfs,

particularly those on the thorn, may be kept down to a size scarcely above that of a gooseberry bush, and when in fruit they are very pretty. They are, however, shorter lived than the dwarf of a larger size. In China, the different species even of the largest growing forest trees, are dwarfed to a similar diminutiveness, by a modification of *Layering* already described. These Chinese dwarfs, once formed, are said to live and bear fruit for a great number of years.

Root Pruned Dwarf Pears. The mode of dwarfing the pear by *root-pruning*, has been very successful in England; and, from some little experience of our own, we are strongly inclined to believe that it will prove equally adapted to our New England soil and climate. Trees of one to three inches in diameter, branching low, and of a stocky habit, are the best subjects to operate upon. The process of forming them is simple, thus :

Dig a circular ditch around the tree, about one foot wide and two feet deep. The ditch should be somewhere about as many feet distant from the tree, as the latter is inches in diameter; for rather large trees the distance should be less than in this proportion; but the

judgment of a skillful operator will be a sufficiently safe guide in all cases. In digging the ditch, the roots of the tree should all be cut off and pared smoothly even with the inner side of the ditch; and the outer fragments of the roots should be removed as cleanly from the surrounding ground as it may be convenient. This done, fill the ditch with generous, rich soil intermingled with the specific fertilizer for the pear (*See page 100.*) Head in the top of the tree judiciously, cutting off from one-fourth to three-fourths of the growth upon the last year's scions. It is well, though not strictly necessary, to cover these little wounds with the gum-shellac composition. This work may be done any time from the first of November to the middle of April, except when the ground is wet, freezing, or frozen. Root-pruned dwarfs will need this treatment as often as once in three years, and frequently, under high cultivation, they will require it once in two years, or even annually. A close observation of the effects of the pruning will be the best guide as to the necessity of repeating it.

Almost any large fruit tree, other than the pear, which does not grow well, or appears

unthrifty, may be greatly benefited by a single application of the treatment just above described.

All varieties probably both of the pear and the apple, may be dwarfed in this manner; and, doubtless, if for no other purpose, it is the best mode in which to cultivate those large-sized fruits which the wind so often strips prematurely off of large trees. Such trees also come early into a bearing state.

Root-pruned dwarfs require the same soil as that for the full-sized trees of the same species. Their distance apart need not exceed from eight to twelve feet.

In heading-in these as all other trees, always cut—as we have before advised—just above a wood-bud on the outer side of the twig or limb, or on the side of it facing the direction in which it is desirable that the twig or limb should extend its growth. By observing this simple direction, a pruning of which dwarfing is the main object, may also be made subservient to a great improvement in the form and general appearance of the tree to which it is applied.

Quince bottomed Dwarf Pears. Grafting upon the quince stock is a deservedly popular

mode of cultivating the pear, in fruit-gardens and other highly and carefully cultivated grounds. Nearly all the class of *Beurre*, or melting pears, succeed in this way,* and many of them are greatly superior to what they usually are when raised upon the pear-rooted standard. The trees grow to the height of ten or twelve feet, and have a peculiar, stocky appearance. They commence bearing in three or four years from the grafting. In ten or fifteen years they come to maturity, bearing from a peck to a bushel of fruit. We have seen a quince-bottomed dwarf-pear, in Col. Wilder's grounds, some fifteen feet high, that has several years borne about a barrel of *Duchesse d'Angouleme* pears,—fruit which sells readily in Boston at twelve and a half cents apiece.

Quince-bottomed pear trees require a deep, rich soil, such as is suitable for the quince. They may be set temporarily four or five feet apart. In the course of some years, if necessary, take out every other row, one or both

* Almost, if not quite every other variety of the pear may be cultivated in this way, by what is called *double-working*, that is, work the Martin Sec, *Beurre d'Amalis*, L. B. de Jersey, or other variety, on the quince, and then, in another year or two, re-work this graft, with the kind that you desire to grow as a dwarf.

ways, and the remaining trees may stand during their life-time, at from eight to ten feet apart. An occasional root-pruning—once in three or four years—has been found very beneficial to the quince-bottomed pear.

In purchasing quince-bottomed dwarf-pears, examine the quince part of the tree to ascertain whether it has been injured by borers. Select good stocky, low-branching, well-rooted trees. In setting out, dig holes sufficiently deep for the purpose, and set the whole of the quince part entirely under ground, *without any regard to the height above the roots at which the grafting was performed.* Fill up the hole and among the roots with rich soil, and aim to have the tree stand, when the work is done, so that the point of union between the quince and pear shall be about one inch below the surface of the ground,—just low enough to hide the quince from the borer, and not so low as to allow the pear to strike roots of its own. It would not answer to plant high grafted dwarfs, so deeply, were it not that the quince has an almost peculiar power of emitting thrifty roots from any part of its trunk or limbs when buried in the earth. We have set many dwarfs in this way, and have never lost one.

The quince-rooted pear enjoys a rich, highly cultivated soil, and is much less able to endure rough treatment or neglect, than his stronger-footed brother of the pear-root. Its appropriate place is the garden, where, properly treated, it is, at once, one of the most ornamental and profitable tenants that can dwell there. Quince-bottomed pears should be headed-in, more or less severely every year.

Dwarf pear-trees whether on quince or pear, which are not to be trained to a wall or trellis, ought to be pruned to a pyramidal or conical form. In order to this, take a tree of one year's growth upon the graft. Shorten back the leading shoot, nearly or quite one half its length. This will develope the desirable side branches; to encourage the growth of which still more, it is well to shorten back the leading shoot, about the first of July. This will, about the middle of the growth of next spring, cause to start out another tier of branches, a foot above the last. The next summer in July the leader is again cut back to within about a foot of the last tier, which will cause the growth of a third set, and this must be repeated every year, till the tree is from six to ten or more feet high, as the taste

of the cultivator may dictate. In the mean time, the side shoots should be pruned into the desired conical form, each spring, or, what is considered by some preferable, they should be *kept* shortened-in, by *pinching off* their ends in the summer. This is Downing's plan, described almost in his own words. We have found a simpler mode of operating to answer every purpose—that is, to shorten-in the leader and side shoots, in the spring only, of each year. We should continue this process, as with the peach, every year so long as the tree continued to make scions, cutting off from one-fourth to three-fourths of the length of each scion every year,—always having an eye to improve, and as far as possible to render conical the form of the tree. To this end we should as we have said before always cut just above a wood-bud, on the outer side of a limb or twig—i. e., the side farthest from the central parts of the tree.

From two to four feet is a sufficient length for the lowest tier of branches; the next tier should be four to eight inches shorter, and so on. Where the dwarf has not been pruned for two or three years from the graft, the first *heading-in* must be done more severely, in

order to get the tree into shape. (See pages 76 to 83.)

A somewhat different, but equally severe pruning is necessary for the dwarf-pear, when trained upon a wall or espalier rail. In all pruning, a skillful operator will modify the mode to suit the particular case in hand. Whatever may be the shape given to the tree, *all dwarf-pears*, (quince-bottomed or root-pruned,) *require the annual heading-in in some form or other*, and those upon pear-roots, an occasional, if not annual root-pruning also.

We may add, by way of caution, that the pear on quince, is not a suitable tree for one who has neither leisure nor taste to attend to its cultivation. It is a very artificial plant, and left entirely to nature's nursing, it will soon die, just as a Parisian dandy would perish, were he suddenly transferred to the haunts and habits of a western savage. Quince-bottomed dwarf-pears, if they appear to be low in the ground after standing some years, ought to be staked and tied, as they are sometimes liable to be blown over.

For Tables of *Size, Quality &c.*, See pages 143 and 144.

DESCRIPTIVE LIST OF QUINCE-ROOTED DWARF-PEARS.

ABBREVIATIONS.

Size.—1, large; 2, medium-size; 3, small.

Quality.—g, good; v. g. very good; b, best.

Use.—T, table; K, kitchen; T K, table and kitchen both months.

Season.—Jan. January; Feb. February; Jan. Feb. both months.

Form.—pyr. pyriform, or long pear-shaped; obov. obovate, or egg-shaped, with stem in small end; turb. turbinate, or shaped like a top, as Deatbarn's seedling; r, roundish; teg. regular.

Remarks.—P. productive; V, very; J, juicy; B, beautiful; But. buttery; Ast. astringent; S, sometimes; set; str. striped.

NO.	NAME.	SIZE	COUL.	SEASON.	COLOR.	FORM.	REMARKS.
1	Summer Franc Real, .	2	b.	Aug. Sept.	p. y. g.	obov.	Tree hardy, P. in all soils, has roundish leaves
2	Bartlett,	1	v. g.	Aug. Sept.	y.	irreg. pyr.	V. P. and popular
3	Beurre d'Amalis, . .	1	v. g.	Sept.	g. y. rus.	irreg. obov.	V. P.
4	Golden Beurre of Bilboa, .	1	b.	Sept.	golden y.	reg. obov.	V. P. 'In cold soils, it is particularly fine on quince stocks.'—DOWNING.
5	Flemish Beauty, . .	1	v. g.	Sept. Oct.	y. rus. r.	obov.	V. P. B. and fine
6	Paradise d'Antonne .	1	b.	Sept. Oct.	y. rus.	pyr.	Flavor rivals that of the Seckel
7	Beurre de Capiaumont, .	2	b.	Sept. Oct.	y. r.	long turb.	V. P. S. astringent,
8	St. Michael,	2	b.	Oct.	p. y. r.	reg. obov.	V. P. no better on quince
9	Gray Doyenne,	2	b.	Oct.	rus.	obov.	Strongly resembles No. 8
10	Louise Bonne de Jersey, .	1	v. g.	Oct.	p. g. r.	long pyr	V. P. and fine, grows better than any other p'r on quince
11	Duchesse d'Angouleme, .	1	b.	Oct. Nov.	g. y. rus.	oblong obov.	Vigorous grower on quince
12	Beurre Diel,	1	b.	Oct. Dec.	y. rus.	obov. pyr.	V. P. and B. V. valuable
13	Vicar of Winkfield, . .	1	v. g.	Nov. Dec.	p. y.	long pyr.	Same as on pear
14	Beurre d'Aremberg, . .	2	b.	Dec. Jan.	p. g. y.	obov.	Better than on pear
15	Glout Morceau,	1	b.	Dec. Jan.	p. y. g.	obtuse oval.	Tree grows strong, is V. P.

Our list of Dwarf pears might easily be extended—almost to any limits, indeed, if we were to include those which require *Double-working*.—(See the note above.) Without this mode of double grafting, however, we might add to our list, *Summer*,—Madeleine, Jargonelle, *Autumn*,—Napoleon, Seckel (better double-worked,) Doyenne Boussouck, Beurre d'Anjou, Sieulle, Urbaniste, and probably the Dix, as this makes a good growth here directly on the quince. Swan's Orange is well worthy of trial on quince, in our climate. To those of *Winter* we might annex, Van Mons Leon Le Clerc, Catillac (for cooking;) and for warm, sheltered situations, with some hesitation, we venture to subjoin Chaumontelle, Passe Colmar and Brown Beurre.

SMALL SELECT LIST of quince-rooted Dwarf pears. *Summer*—Summer Franc Real, Bartlett. *Autumn*—Golden Beurre of Bilboa, Flemish Beauty, St. Michael, Louise Bonne de Jersey, Duchesse d'Angouleme, Beurre Diel. *Winter*—Glout Morceau.

STILL SMALLER LIST—We recommend, (or rather humbly submit,) *Summer*—Bartlett, *Autumn*—St. Michael, L. B. de Jersey, Beurre Diel. *Winter*—Glout Morceau.

For a single dwarf tree, we know no better grower than the fine flavored Louise Bonne de Jersey, and no better fruit than the Saint Michael, or, as otherwise called, the White Doyenne. Either of these ought to be satisfactory to any reasonable man. Should one desire both upon a single tree, work the St. M. upon the top of the L. B. de Jersey.

SECTION III.

INSECTS, DISEASES, AND REMEDIES.

There are but two insects that we have known to injure pear trees in New England, although Downing affirms that the same insects that infest the apple do sometimes attack the pear also.

1st. *The Slug-worm.* This insect (*Selandria Cerasi* of Harris,) is a kind of olive-colored naked snail, about a quarter of an inch long. It appears on the upper sides of the leaves, from June to August, and frequently does serious injury to young trees, by preying upon the juices of their leaves. An excellent way to kill these vermin is to water the leaves with the whale-oil soap liquid, described on page 109. Ashes or quicklime sprinkled upon them, will also destroy them.

2d. *The Scolytus Pyri.* This insect is supposed to cause what is called the *Fire-*

blight. In the midst of the luxuriant growth of summer, a limb affected by this disease suddenly turns brown and dies. If the disorder is not arrested the entire tree is usually destroyed by it. There is no half-way remedy; the malady extends downward from the point of its external appearance, and it is necessary to cut off the affected limb immediately, at least a foot below all symptoms of the disease.

Winter Blight, called by Downing, *Frozen sap Blight*. This disorder manifests itself by the extremities of the limbs shrivelling, turning black and dying. Downing attributes the cause of this to the action of frost in winter; others think it is owing to the strong penetrating rays of the sun in summer. Trees that grow luxuriantly in moist soils in the nursery, are the most subject to it. We have rarely seen a large tree in this vicinity affected with the disorder, although we understand, that it is almost confined to large trees in some sections of the country. There probably may not be less than three sources of the pear blight; *an insect* causing the *Insect-Blight*; *the changes of winter weather*, causing the *Winter-Blight*; *the rays of the sun* causing what might be called *Sun-Blight*.

As a *preventive* of any of these forms of the disease, plant out the trees, in dryish, rich soil, and occasionally root-prune them. As a *remedy*, cut off seasonably the affected parts down to the perfectly healthy, sound wood.

Downing says of this malady, that it has, at different times, been "the terror and the despair of pear growers." The disease is irregular both in the time and the manner of its attacks. It sometimes destroys only a single limb; at other times it, in the course of a few days, causes the death of an entire tree. In some sections of the country it is scarcely known; in others its ravages have been such as to greatly discourage the cultivation of the fruit. The disorder has, as yet, done comparatively little mischief in the New England States.

SECTION IV.

GATHERING AND RIPENING THE PEAR, AND USES
OF THE FRUIT.

All our winter pears (and apples also,) are, of necessity, *ripened in the house*. Nearly all summer pears and a very large proportion of the autumn varieties, are greatly improved by ripening them in the house also. Nor is this peculiar to the pear. Wheat and some other grains, gathered at a particular time just before maturity, will be more bulky, heavier and better than when left to get dead ripe, as it is called, in the field. We cannot in this little work go into an investigation of the theory of this process. It is enough to assert *the unquestionable fact*.

Generally, then, we advise to take summer and early autumn pears from the trees just when some of the earlier full-grown, specimens begin to ripen. Gather them carefully by hand in a dry day, spread them on the

shelves of your *fruit room*, or upon the floor of a cool dry chamber. Here they will ripen by degrees, and without further care.

Late autumn and winter pears should also be gathered very carefully by hand, in dry weather. Put them away very carefully—so as not to bruise or indent them in the least—in tight clean, wooden boxes, buckets or barrels;* and keep them in a cool, dry, airy room or cellar, of which the temperature shall be from about 38° to 45° Fahr. Examine them occasionally and if they are sweating, take them out carefully, dry them upon the floor and then repack them as before.

About ten days before their usual time of maturity, bring them into a room of which the temperature is from 60° to 70°. Whoever follows the above directions for the first time, will be agreeably surprised at the result of his experiment. 'The Beurre d' Aremberg and probably some others may be successfully managed in the same way as winter apples.

Many pears early and late are lost to their

* Some advise to wrap each pear in soft paper before putting it into the boxes, &c.

cultivators from an ignorance of the proper modes of ripening them. In Europe, this branch of fruit-culture is considered almost a science of itself. Never, therefore, throw away a specimen, or re-graft a tree of a pear of doubtful character, until *all* the modes of ripening the fruit have first been tried for at least *two* successive years.

The Uses of the Pear are not dissimilar to those of the apple. It is, however, much more highly esteemed for the dessert, as the market value of the fruit sufficiently evinces. One dollar per dozen for the *Duchesse d'Angouleme* pear is not an uncommon price; and specimens of the *Beurre Diel* have been retailed at twenty-five cents apiece, solely too for the gratification, not of the eye, but of the palate of the purchaser. For preserving, baking, stewing, marmalades, and for drying, it is extensively in use, wherever it is known. Generally, melting or *Beurre* pears are preferable for the dessert, and those with firm, crisp breaking flesh, for the kitchen.

The fermented juice of the pear is called *Perry*. The process of preparing this liquor is precisely similar to that of making cider. As a beverage most people prefer it to the juice

of the apple. In former years considerable quantities of perry were manufactured in the vicinity of Portsmouth, N. H. and elsewhere in the eastern States. Of this article an old English writer affirms, "Wine made of the juice of the Pear, being taken in small quantities, comforteth and warmeth the stomach, and causeth good digestion."

CHAPTER III.

THE PEACH, AND THE NECTARINE.

SECTION I.

CULTIVATION, &C.

Choice of a tree.—The best age at which to plant out the peach in an orchard, is one year from the bud and two years from the seed. Nothing is gained by purchasing trees older than this, unless they have been transplanted once or twice before. Select a stocky, rather low branching, vigorous looking tree, free from gummy exudations in every part. This gummy matter will appear, if anywhere, on the roots, about the collar, on the sides and in the forks of the limbs. The insects, doing this mischief, live but a single year and are easily destroyed. Trees otherwise satisfactory ought not, therefore, to be rejected on this

account solely, unless they have suffered quite severely from the ravages of the worm. However, it is always preferable to obtain trees entirely exempt from this injury.

Dwarfs and Standards. The peach is dwarfed, by working it upon a plum-stock. For a very cold climate these dwarfs are considered more hardy than standards. They are also well adapted to cold clayey soils, which are unfit for the peach root. With these exceptions, dwarf peach-trees are not valuable to cultivate, unless it may be as curiosities.

Soil. "The very best soil for the peach," says Downing, "is a rich, deep sandy loam; next to this, a strong mellow loam." Thomas recommends "a light soil;" Kenrick, "a rich, sandy loam." An extremely rich soil, in our cold climate, sometimes imparts too rank a growth to the tree, thereby rendering it rather too tender to brave the severity of the winter.

Distance. Twelve or fourteen feet apart is a sufficient distance for the trees of a New England orchard. The trees may be set in rows extending north and south, the rows being twelve to sixteen feet apart, and the trees eight to ten feet apart in the rows. This will

often be found a convenient arrangement where the whole ground is kept under cultivation.

Transplanting. We have succeeded as well, transplanting the peach in the autumn, as in the spring. Doing the work in autumn, however, we have been very particular to place a good-sized conical mound of soil around the tree, as recommended in section 2d. of the Chapter on *transplanting*. Cultivators generally, in the northern states, advise to transplant the peach, in the spring; and some think they meet with better success, moving the tree, only two or three days before its blossoms begin to open. Little peach trees, budded the previous autumn, may be quite successfully transplanted, in the spring, without injury to the bud. But generally, it is better to wait till the bud has had one year's growth.

Cultivation. The rules are nearly the same as for the apple and pear. What is called *very* high cultivation, as we have remarked, is hardly safe in our climate. We may, however, remark that high cultivation is not an offence, often committed by our farmers against the peach, or any other fruit tree. 'The crim-

inality extends mostly in an opposite direction—neglected cultivation. Doubtless, this sin of omission lieth even unto the doors of ninety-nine in a hundred of the fruit cultivators, of this section of the country.

The peach—perhaps better worked on plum stocks, for this purpose—will succeed even in a very cold climate, when trained upon a south wall, and slightly protected by pine boughs through the winter and, more especially, through the changeable weather of early spring. For a mode of training the peach, in *very* rigorous climates, see the Chapter on *Training*.

Pruning. The peach needs little pruning except the *shortening-in* system, recommended in Sec. 1. of Chap. V. Part 1. Any time from late autumn until the latter part of April, cut off with no great carefulness, from one-fourth to three-fourths of the last year's growth, all over the tree. The very best time perhaps to do this, is in the month of March. This *shortening-in* pruning should be done every year, as long as the tree lives, commencing on the first year's growth of the bud. The operation is performed much more rapidly than one would suppose. The appearance,

the health, and the productiveness of the peach, the nectarine and the apricot, are all greatly improved by this treatment.

Insects. The only insect that seriously injures the peach-tree in this section of the country, is the Peach-worm, (*Ægeria exitiosa*.) This insect deposits its eggs in the trunk of the tree, at the surface of the ground and in the forks of the limbs, &c. The egg hatches and becomes a worm of one-fourth to three-fourths of an inch in length. This worm devours the inner bark and sap-wood of the tree, at and about the points where the eggs are laid. Its presence may be known by the gum which exudes from the bark in consequence. When the worm gets into the forks of a tree, it causes the splitting of the tree at those points; and unless its progress is arrested, it will sometimes do very serious damage.

The preventive against this insect is very simple. It is only necessary to put half a peck of ashes or air-slacked lime, close around the collar of the tree, (that is at the surface of the ground,) in the month of May, and remove it again in October. For other preventives and the modes of getting rid of

this insect, see directions for destroying the *Borer*, in Section 3d of the Chapter on *The Apple*.

The Yellows. This destructive disease has proved fatal to whole orchards, in some sections of the country. Its symptoms are,—1st, a growth of *slender, sickly, wiry shoots*, with small yellowish leaves; 2d, *the premature ripening of the fruit*, two or three weeks earlier than its proper season. This disorder seems most disposed to attack rapid growing varieties. It is propagated by planting the stones of peaches grown upon affected trees, by budding, and also by the pruning knife communicating the infectious sap from one tree to another. It is universally believed to be a contagious disorder, and whoever has a tree decidedly affected with it, ought to cut down and burn the tree at once. There is *no other* sure remedy yet known. Downing thinks that those who have trees healthy in this respect, may keep them so by the *shortening-in* system, already strongly recommended for its other beneficial effects.

Identifying Varieties. Different varieties of this fruit are less easily identified by their form and color, than those of the apple and

pear. Collateral aid to this is derived from the size and color of the blossoms, and from certain marks on the leaves. There are three classes of peaches in reference to these *leaf marks*.

Class 1. Those whose leaves are deeply and doubly serrated, (cut like saw-teeth,) having *no glands*.*

Class 2. Those whose leaves are crenate or serrulate, (that is having smaller rounded teeth,) with globose (or round) glands.

Class 3. These have crenate or serrulate leaves like class 2d, with reniform (kidney-shaped, or longish) glands.

These marks upon the leaves of the peach are invariable. The use of these to the cultivator is obvious; for example, if any one should buy a tree, say for the *Early Crawford* variety, and its leaves either should have no glands at all, or have those which are reniform, it would be *certain* that the tree was not what it was purchased for; because the *Early Crawford* *always* has *globose* glands.

* The *glands* are of the size of a pins' head or a little larger. They are easily discoverable upon that part of the stem of the leaf where it begins to widen out into the leaf, and just beyond that point, on the edges of the leaf.

Gathering the fruit. Unlike the pear, the peach is always best, ripened upon the tree. Gather and keep it (if necessary to keep it,) in a cool dry airy room until wanted.

Uses of the Fruit. The peach is one of the most delicious of dessert fruits. In some sections of the country, it is preserved by drying. In the south, it has been extensively cultivated for the purpose of distilling its juice into brandy.

SECTION II.

DESCRIPTIVE LIST OF PEACHES,

Fine varieties of the peach are often produced from the seed. Hundreds have been thus originated and described by nurserymen and others within the last few years.

The following lists comprise those which we believe to be the best adapted to the wants of those generally who cultivate this fruit, either for their own tables or for the market. The reputation of these peaches is so well established, that one may safely engage in their cultivation upon as large or as small a scale as he may desire.

For Tables of *Quality, Size, &c. &c.*, See the *Preliminary Remarks* to Part II.

DESCRIPTIVE LIST OF PEACHES.

ABBREVIATIONS.

Size.—1, large; 2, medium-size; 3, small.

Leaves.—g. globose glands; r. reniform glands; s. serrated without glands.

Flowers.—l. large; s. small.

Flesh.—f. freestone; c. clingstone, w. white; y. yellow; g. green.

Season.—Aug. August; Aug. Sept. both months, &c. Coloa.—y, yellow; w. white; r, red; r, c. red cheek; g. green.

Remarks.—P. productive; V. very; B. beautiful; S, sometimes.

NO.	NAME.	SIZE.	LEAVES.	FLOWERS.	FLESH.	SEASON.	COLOR.	REMARKS.
1	Early Sweet Water,	2	g.	l.	f. w.	Aug.	w.	Tree is thrifty, but not V. P.
2	Early Tillotson,	2	s.	s.	f. w.	Aug.	reddish.	V. P. and valuable
3	Early York,	2	s.	l.	f. w.	Aug.	red.	V. P. S. mildews a little, slow grower
4	Cooledge's Favorite,	1	g.	s.	f. w.	Aug. Sept.	w. r. c.	Tree V. P. and hardy, excellent market peach
5	George IV.	1	g.	s.	f. w.	Sept.	y. w. r. c.	Tree V. P. and hardy, no better peach
6	Grosse, Mignonne,	1	g.	l.	f. w.	Sept.	y. w. r. c.	V. P. capital old French variety
7	Yellow Rareripe,	1	g.	s.	f. y.	Sept.	y. r.	V. P. and hardy
8	Crawford's Early,	1	g.	s.	f. y.	Sept.	y. r. c.	Tree V. hardy and P. fruit V. handsome and good for market
9	Morris's White,	2	r.	s.	f. w.	Sept.	g. w. r. c.	Tree vigorous and P.
10	Nivette,	1	g.	s.	f. g.	Sept.	g. r. c.	Excellent French variety
11	Old Mixon Freestone,	1	g.	s.	f. w.	Sept.	y. w. r. c.	P. and fine
12	Snow,	1	r.	s.	f. w.	Sept.	w.	Tree V. hardy and P. the common White Blossom, or Willow peach is greatly inferior to this
13	Yellow Red Rareripe,	1		s.	f. y.	Sept.	y. r. c.	Tree V. P. capital fruit
14	Late Admirable,	1	g.	s.	f. w.	Sept.	y. g. r. c.	Tree hardy and P.
15	Red Cheek Melocoton,	1	g.	s.	f. y.	Sept. Oct.	y. r. c.	Tree V. P. fruit V. B. and good
16	Crawford's Late,	1	g.	s.	f. y.	Sept. Oct.	y. r. c.	In all respects our best late peach

Our list of peaches might easily be extended to fifty or more varieties. Were we to add to the above described catalogue, we should select from among the following :

Last of Summer—Early Anne, Dixie's Eureka, Lemon Rareripe, &c. *Early Autumn*—Cheney's Perfection, (*W. Co. Seedling*,) Bergen's Yellow, Red Rareripe, Walter's Early, Early Newington, Large Yellow Melocton, Jaques (*very large*,) Brevoort, Bellegarde, Morris's Red, &c. *Mid Autumn*—President, Prince's Red Rareripe, Kenrick's Heath, Late White, &c.—also, for *preserving*, the Blood Clingstone, and (in warm situations) the Lemon Clingstone.

All the above described peaches, except the latter two, are freestone varieties, clingstone peaches not being valuable in so cold a climate as ours.

SELECT LIST. *Last of Summer*—Early Sweet Water, Cooledge's Favorite, George Fourth. *Early Autumn*—Yellow Rareripe, Crawford's Early, Old Mixon Freestone, Yellow Red Rareripe, *Mid Autumn*—Crawford's Late.

SMALLER SELECT LIST. Cooledge's Favor-

ite, George Fourth, Crawford's Early, Crawford's Late.

For a single tree, none is better than George Fourth, or Crawford's Early.

THE NECTARINE.

The nectarine, or smooth peach, is only a smooth-skinned accidental sub-species or variety of the peach, requiring precisely the same cultivation and management in every respect. The fruit of nectarine trees like that of the apricot is greatly injured by the *Curculio*. For preventives, &c. of this insect, see the chapters on *The Apricot* and *The Plum*.

The nectarine is not a valuable fruit for general cultivation, and accordingly we recommend only three varieties of it, all freestones, namely, Early Violet, Elruge, and Boston. The latter of these is altogether the best,—the tree being hardy and productive, and the fruit very beautiful and excellent.

CHAPTER IV.

THE CHERRY.

Choice of a tree. The cherry being among the handsomest of all fruit trees, one may require the tree which a nurseryman shall offer him, to have a straight trunk and a fine symmetrical top. The root also should be well proportioned and sufficiently supplied with fibres.

Dwarf and Standards. The cherry is but very little cultivated in this country as a dwarf. The Mahaleb stock, on which the dwarfs are worked, or the little bush trees themselves, may be had of the importers.

Standard cherries are generally worked upon those excellent stocks, the Black Mazzard seedlings.

Soil. Downing recommends a sandy or gravelly loam. The trees will bear quite a dry situation. A mixture of one bushel of

leached ashes to two or three of peat is an excellent manure for the cherry.

Distance. The distance for cherries, in an orchard, is about the same as that for pear-trees, say eighteen to twenty-five feet. Some varieties may be set nearer together than others.

Transplanting. Two years from the bud is a sufficiently large size for setting in the orchard. Like those of the pear, large cherry-trees are not easily moved, unless they have been previously re-set, once or twice since they were in the nursery. See directions already given, in the Chapter on *Transplanting*.

Cultivation. Follow the directions in the chapters on *The Apple* and *The Pear*.

Pruning. The cherry needs but very little pruning, less than almost any other fruit-tree. The directions, in the Chapter on *The Apple*, may be followed so far as it may seem necessary to prune at all.

Insects, Diseases, Remedies. The cherry in our climate, is happily exempt from diseases and the depredations of insects.

Birds may be kept from the fruit by a cov-

ering of netting, or by various modes of frightening them.

Gathering the Fruit. Always if practicable gather the cherry when it is not wet and with the stems attached. If the fruit is put into an ice-box and cooled before being brought to the table, it will be greatly improved.

Uses of the Fruit. The Cherry is chiefly used for the dessert ; it is employed also in making tarts, &c.

In some parts of Europe both the tree and its fruit have a *use* which, by a pardonable digression, we may mention here.

From Brunn to Olmutz, says Loudon, the road lies through an avenue of cherry trees for sixty miles in length. Beneath the friendly shade of these, the poor pedestrian finds rest and refreshment, on his weary journey. Whenever the proprietor of the lands through which the avenue passes, desires to reserve the cherries on a particular tree, he has only to let his wishes be known, by tying a wisp of straw around the tree. This simple *appropriating mark* affords a protection to the fruit which an *American*, whose only security is a faithful watch-dog or strong picket fence, ought hardly to be blamed for envying.

Downing divides cherry-trees into four classes, according to their forms of growth and the characteristics of their fruits.

Class 1. Heart Cherries. These trees grow vigorous, tall and upright. The fruit is heart-shaped, sweet, and tender-fleshed. The Common Mazzard and the Black Heart are types of this class.

Class 2. Bigarreau Cherries.—The trees and fruit are the same as in class 1st, except that the fruit is hard-fleshed and breaking, instead of soft. The Yellow Spanish is a type of this class.

Class 3. Duke Cherries. The trees grow upright when young and finally form round heads, something like an apple tree. The fruit is round, tender, juicy and subacid. The May Duke is the type of this class.

Class 4. Morello Cherries. The trees of this class, have a somewhat low bushy spreading growth, with long wiry branches. The fruit is the same as in class 3d, except that it is smaller and more acid. The Kentish or pie cherry is a type of this class.

DESCRIPTIVE LIST OF CHERRIES.

ABBREVIATIONS.

Size.—1. large; 2, medium-size; 3, small.
Quality.—g, good; v. g. very good; b, best.
Class.—h, heart cherries, tender fleshed; b, bigarreau do. hard fleshed; d, dukes; m, morelloes.
Stalk.—l, long stem; m, medium length; s, short stem.
Season.—Aug. August; &c.; e. early; m, middle; l, late.
Color.—p, pale; y, yellow; r, red; d, deep; b, black; am, amber; r, c, red cheek.
Remarks.—P, productive; V, very; B, beautiful; S, sometimes; ex, excellent.

NO.	NAME.	SIZE	QUAL.	CLASS	STALK	SEASON.	COLOR.	REMARKS.
1	Baumann's May,	3	g.	h.	l.	e. June.	d. r.	V. P. "the earliest cherry"
2	Early White Heart,	2	b.	h.	m.	e. June.	y. r. c.	Tree handsome and bears well, V. popular
3	May Duke,	1	b.	d.	m.	June, July.	r.	Tree V. P. and hardy, but not very handsome. Fruit ripens gradually
4	Elton,	1	b.	b.	l.	June, July.	r.	Tree V. P. and hardy, fruit V. B. & ex.
5	Black Tartarean,	1	b.	h.	l.	June, July.	b.	Tree V. P. fruit V. large, B. and ex.
6	Black Eagle,	1	b.	h.	m.	e. July.	b.	Tree strong and hardy with large leaves
7	Black Heart,	2	b.	h.	m.	e. July.	b.	One of the best, hardy tree
8	Belle de Choisy,	2	b.	d.	m.	e. July.	am.	P. delicate and fine fruit
9	Yellow Spanish,	2	b.	b.	l.	e. July.	y. r. c.	V. P. even when young, fine for market
10	Napoleon Bigarreau,	1	b.	b.	e.	e. July.	am. r. c.	Tree strong and P. fruit V. large
11	American Amber,	2	v. g.	h.	l.	e. July.	am. r. c.	V. P. B. fruit
12	Downton,	1	v. g.	h.	l.	m. July.	y. r. c.	Tree hardy, fruit B. and ex.
13	Downer's Late,	2	b.	h.	l.	m. July.	r.	Tree hardy and V. P. and fruit ex.
14	Late Duke,	1	v. g.	d. m.	m.	e. July, Aug.	dark r.	Tree vigorous, but resembles Morello class, fine late fruit

We have deescribed only fourteen varieties of the cherry. Those who wish to extend the list can add Knight's Early Black, Flesh-colored Bigarreau, Davenport's Early, Holland Bigarreau, Sparhawk's Honey, Tradescant's Black, Kentish, Black Morello (*for preserves*), &c. &c.

SELECT LIST of *six* hardy, productive, and fine cherries for the interior of New England;—Early White Heart, May Duke, Black Tartarean, Black Eagle, Black Heart, Downer's Late.

SMALL, SELECT LIST of *three Varieties*. We say, without much hesitancy, Early White Heart, (or for a *very* cold locality, May Duke,) Black Eagle, Downer's Late.

The Black Eagle is as valuable, for a single tree, as any with which we are acquainted.

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CHAPTER V.

THE QUINCE.

Soil. The Quince requires a deep, rich soil, not necessarily moist. Downing says "a rich mellow, deep soil even if quite dry," suits it admirably. This tree, however, *will* bear a moister soil than most other fruit trees.

Distance. Quince trees should be set about eight or ten feet apart.

Cultivation. This is the same as for the apple and pear.

Insects. The Quince-borer has the same habits as that of the apple; and yields to the same preventives and destructives.

Blight. When a blight appears on the quince similar to the *Pear Blight*, employ the preventives and remedies as for the pear. See Chapter on *The Pear*.

Uses. The Quince is a Kitchen fruit, used for preserving, sauces, &c.

Varieties.—There are two varieties gene-

rally cultivated in this country,—the *Orange* and the *Pear*. The latter is the later of the two, and is perhaps less valuable than the other.

Another variety, the *Portugal Quince*, is of rather better quality than either of the others; but it is so shy of bearing that it is little cultivated, excepting by some as a stock on which to graft the pear. Its larger and stronger growth render it well adapted to this use.

Propagation. The quince bush may easily be raised from the seed, (See page 58.) But seedling quinces, like those of the apple, etc., manifest, though in a less degree, that same disposition to degenerate which seems inherent in all our finer cultivated fruits. Unless, therefore, one is willing to graft his seedling quinces, it will be quite as well to propagate the bushes, by the mode recommended on page 29th.

Uses. The quince is a kitchen fruit, used for preserving, sauces, &c. There are two varieties gene-

CHAPTER VI.

THE PLUM.

Choice of a Tree. A good plum tree is straight, well formed and entirely free from black excrescences on the trunk and limbs. It should be grafted upon a finely-rooted *free-growing* plum stock. Plum as well as other trees, of which the graft appears to be overgrowing the stock, should always be avoided; for such growing trees rarely fail of disappointing the wishes of those who cultivate them.

Standards and Dwarfs. The plum is dwarfed by grafting it upon the Mirabelle plum stock, but dwarf-plums are not worthy of cultivation except as curiosities. Standards are worked upon strong free growing English plum stocks, and never very advantageously on the peach or the wild plum, or on any other stock.

Soil. Downing recommends "heavy loams

with considerable mixture of clay." The plum does not do so well, in dry soils, as other fruit-trees.

Distance. A plum orchard may be set with the trees ten to fifteen feet apart.

Transplanting. The plum is a tree very easily transplanted. (See the Chapter on *Transplanting*, Part 1.

Pruning. The directions are the same as those for the apple. Unthrifty plum trees are sometimes benefited by an occasional application of the shortening-in system, recommended for the peach, and also for the dwarf-pear.

Insects, Diseases, Remedies. These are the Curculio or plum-weevil, and the Black Excrescence. The Curculio is the worm found in the fruit. It is of a dark brown color, and about a quarter of an inch long. The insect at the season of laying its eggs, may be frightened away, by frequently shaking it off, or even by persons often passing close by the tree. It may be caught by shaking the tree, having sheets spread on the ground underneath. Both of these methods have been frequently practised with great success. Letting swine among the trees to devour the wormy

fruit as it drops, will in a year or two destroy the whole race of this insect. Paving the ground all around the tree, has answered the same purpose. About one quart of salt should be spread around and under every plum tree in the autumn, to keep it in good health.

Black Excrescence. The only remedy yet known for this excrescence is a severe one, namely, to persevere in cutting it off and burning it, whenever and wherever it appears. And it is true as the Book of Proverbs,—whoso spareth the knife in this work, hateth his plum tree.

Uses of the Fruit. These are similar to those of the cherry.

The *Preliminary Remarks* to Part II. will be generally applicable to the *Plum*, although its season is comparatively a short one.

DESCRIPTIVE LIST OF PLUMS.

ABBREVIATIONS.

Size.—1, large; 2, medium; 3, small.
 Qual.—g. good; v. g. very good; b. best.
 Stalk.—l. long; m. medium; s. short.
 Season.—Aug. August, &c.; e. early; m. middle; l. late.
 Color.—p. pale; b. blue; y. yellow; pur. purple; r. red; d. dark; r. c. red cheek; br. brown.
 Form.—r. round; o. oval; obo. obovate; long.
 Remarks.—P. productive; V. very; B. beautiful.

NO.	NAME.	SIZE	QUAL.	STALK	SEASON.	COLOR.	FORM.	REMARKS.
1	Wheeler,	1	g.	m.	Aug.	y. r. c.	round o.	P. and V. k. good for market
2	Washington,	1	b.	s.	Aug. Sept.	y. g. p. r. c.	round o.	Tree has large leaves, fruit V. large
3	Cruger's Scarlet,	2	v. g.	s.	Aug. Sept.	ilac, r.	roundish	Tree will bear a light soil, fruit V. fine and beautiful
4	Green Gage,	2	b.	m.	Aug. Sept.	pale g.	round	Tree grows quite slow, fruit exquisite
5	Red Gage,	2	b.	s.	Aug. Sept.	br. red	round o.	Tree V. hardy and P.
6	Smith's Orleans,	1	b.	m.	e. Sept.	r. pur.	ovate	V. P.
7	Purple Gage,	2	b.	l.	Sept.	y. pur.	roundish	Fruit ripens gradually
8	Bleeker's Gage,	2	b.	l.	Sept.	y.	round o.	Tree hardy and V. P.
9	Prince's Imperial Gage,	1	v. g.	l.	Sept.	g. y.	oval	Tree hardy and V. P. market fruit
10	Jefferson,	1	h.	l.	m. Sept.	y. r.	long o.	P. and one of the very best
11	Lombard,	2	v. g.	m.	Sept.	r.	round o.	V. P. and hardy tree, will bear a dry soil
12	Coe's Golden Drop,	1	b.	m.	l. Sept.	y.	round obo.	B. and fine

Additional varieties may be selected from among the following:—Columbia, Duane's Purple, Yellow Egg (*for cooking*,) Prince's Yellow Gage, Blue Imperatrice, (*for preserving*,) Huling's Superb, Purple Favorite, &c.

SELECT LIST. Bleecker's Gage, Washington, Prince's Imperial Gage, Green Gage, Jefferson, Coe's Golden Drop.

SMALLER LIST of three varieties. We find it quite difficult to make the selection; but with some considerable hesitation, we venture to recommend the Washington, Green Gage, and Jefferson. The (old) Green Gage, though quite a slow growing tree, is the best flavored of all plums.

A tree of this is worth as much as any other single tree, of which the reputation is well established here. For a single tree, in his locality, Downing prefers the Jefferson.

CHAPTER VII.

THE GRAPE.

Soil. The Grape requires a deep, rich, fertile soil, with a drainage or dry sub-soil. It is not lost labor to make the soil two or two and a half feet deep, placing underneath a drainage of cobble-stones or—what is very much better—of old broken bones. Mix with the soil the general manure—see p. 98—and add a small quantity of lime, ashes, and plaster of Paris,—also bone dust, if you have it.

Cultivation.—The grape is raised easily from layers, and sometimes from cuttings. It may also be grafted on common wild vines, (see Grafting.) In Europe, the grape is extensively cultivated for making wine. Some idea of the extent of this cultivation may be formed from the estimate, that 500,000,000 imperial gallons of this wine have been made in France in a single year.

In vineyards, vines may be planted about eight feet apart each way, and trained each one to a strong stake, something after the manner of cultivating hops. For training the grape upon a trellis, see page 85th.

Pruning and Training.—Never, if avoidable, touch the knife to a grape-vine (for heavy pruning,) except in late autumn, or in the winter; for its appearance and health are injured by the bleeding which results from spring pruning. When your vine is formed, according to the plan described in Chap. VI. of Part I., cut down all the shoots at the time above-mentioned to within two or three buds of the old or last year's wood;—Downing says cut the shoots down to within an inch of the shoot from which they sprung.

This *Shortening-in, &c.*, (somewhat similar that of the peach,) is about all the pruning that our native out-door grapes require, and they often succeed admirably without any training or pruning at all. Downing, however, recommends very severe pruning; he considers a space eight feet square to be as much surface as a native grape vine ought to be allowed to cover.

Grafting the Grape. This has been done

with good success, by the common mode of *cleft-grafting*. The operation ought to be delayed until the vine is in full leaf, the scions having been kept dormant in a cool cellar until used. (See page 43.)

Keeping the Grape. Take the ripe clusters when free from external moisture, and pack them in jars, filling all the interstices with baked saw-dust. The grapes which are exported from France and Spain, are packed in this way. Alternate layers of grapes and kiln-dried bran would probably answer equally well.

Grapes have also been successfully kept for several months, by putting them in common flower-pots, and filling in, under, around and above them with common fine sand, a drainage of broken earthen or the like having first been placed in the bottom of the pot. The sand must be kept moist, and at a temperature a little above freezing.

These modes of preserving the grape are well worthy of trial; for, though not highly prized in its season, the fruit might be quite a luxury at mid-winter.

Uses of the Grape. Our hardy native grapes are not very much esteemed for the

dessert. Good house-keepers make some use of them in the kitchen. We hope, however, that new hybrid seedlings will yet be raised, which shall be far more valuable than any now cultivated.

Varieties—The *Isabella* succeeds well, in warm situations, in Worcester county; but the best three grapes that we know to be *perfectly* hardy with us, are, first and most valuable, the *Blackstone*; second, the *Fitchburg* (both natives of this county;) third, the *Carter* (which originated near Lowell.) In situations too cold for the *Isabella*, there is no better grape to cultivate than the *Blackstone*.

The *Catawba*, and the *White Sweetwater* (or *Chasselas*) are delicious grapes. They may be successfully cultivated, in the interior of New England, by pruning them heavily, in November, and laying them down, under a covering of three or four inches of loam and straw intermixed. Or they may be covered with a foot or more of soil, which should be carefully removed, early in the spring.

CHAPTER VIII.

THE APRICOT.

The Apricot would be a very desirable tree to cultivate, were it not for the difficulties in the way of obtaining even a small crop of its fruit.

The apricot is best, worked on the plum-stock; although it grows well also on the peach. The tree is of small growth, and is even less hardy than some varieties of the peach. It requires a deep, dry soil, and a somewhat sheltered situation.

The apricot needs the same cultivation and shortening-in pruning, which we have recommended for the peach.

Insects, &c. The insect (*Peach-worm*) which sometimes does so much mischief among peach trees, also works upon the apricot. But the greatest obstacle in the way of obtaining a good crop of the fruit, is the *Curculio*. It has been remarked that strong

offensive odors were often efficacious, in preventing the approach of insects. Thus we have heard of an apricot's being protected from the curculio, by winding a small rope strongly impregnated with tar, around and up through the trunk and branches of the tree. Downing recommends rags dipped in coal-tar to be hung in the tree, for this purpose. See the Chapter on *The Plum*.

Varieties Downing recommends for a small garden, the Large Early, Breda, Peach, and Moorpark.

The hardiest varieties worthy of cultivation are the Red Masculine, Roman, and Breda. For a single tree the Roman or the Red Masculine is as good as any.

CHAPTER VIII.

NUTS.

These fruits are certainly deserving of notice. Among those which are perfectly hardy in our climate we enumerate the Shellbark, Oilnut or Butternut, Chestnut, Black Walnut, Beach nut, Hazle nut, and—what is not generally known—the Filbert. It is said that all these nuts may be propagated by the ordinary modes of grafting; and, doubtless, they are in this way susceptible of as much improvement in size, flavor, &c., &c., as has been effected with the apple, and other cultivated fruits.

The European Walnut. This is better known by the name of the *Madeira* nut. The tree is of a fine lofty form, resembling that of the common Butternut or Oilnut. It is perfectly hardy, on Long Island and to the south of New York. And, as far north as the city of Charlestown in this state, there

may be seen, in the enclosure of a residence on Harvard street, two fine trees of this kind, either of them much taller and larger than the largest-sized of our apple-trees. We have eaten nuts from these trees, well-ripened and fully equal to any of those which are imported. The trees often bear a crop of some bushels of the fruit. Downing says this tree "may, with due care, be grafted on the common hickory nut."*

The Filbert. This is only an improved variety of the common wild hazel nut of Europe. It is not very generally known, that this fine nut may be easily grown, in open culture, in a suitable soil, here in the eastern states.

We saw fine samples of the filbert, which were grown in Boston, and exhibited at the last Annual Exhibition of the Mass. Horticultural Society. From an Article, on the 457th page of the second volume of Downing's Horticulturist, we learn "that a filbert tree (or rather bush,) may be rendered productive, in almost as small a space as is occupied by an ordinary gooseberry or currant bush. In fact—says the writer—under favorable

* Has it been done?

circumstances, the produce of these neat bushes is astonishing." It is said that, from a single forest near Recus, in Spain, sixty thousand bushels of this nut have been gathered in a single year. A loamy soil, with a dry subsoil, suits the plant well. The bushes may be raised best from suckers or layers, or they may be easily grafted on the common hazel nut. They may be suffered to grow either in the *tree* or the *bush* form, probably the latter is the best. They require the same annual pruning and thinning that is given to the gooseberry. "A few plants of them," says Downing—"should have a place in all our gardens." Phillips and Loudon both represent this nut as well deserving of cultivation on account of the profitable return which it makes for the labor bestowed upon it. The former states that the crop of a single acre of filberts has been sold for fifty pounds (upwards of \$200.)

CHAPTER IX.

BERRY-FRUITS.

SECTION I.

THE STRAWBERRY.

The strawberry is a perennial plant, a native both of the old and the new world. It is considered by many the most delicious and wholesome of all berries.

I. CULTIVATION, ETC.

Soil. The best soil for the plants is a deep rich loam. Two feet of this soil will give finer plants and larger crops of the fruit than a depth of only one foot would produce.

Specific Manures.—Slight intermixtures with the soil, of super-phosphate of lime, sulphate of ammonia, guano, bone-dust,

soot, nitrate of soda, &c., are recommended by English writers; but we hardly need them in rich soils here.

Propagation. The varieties of the strawberry, excepting the Bush Alpine, * easily and rapidly propagate themselves by their *runners*. They thus form a great number of *new plants* every season.

Transplanting. The strawberry *may* be transplanted (that is the new plants of it,) in August and September; but in our climate it is perhaps better to do this work in the spring. Downing advises to select the new plants from the runners of those old plants which were the most productive the previous summer. Other plants, however, answer very well.

Setting in Rows.—For market cultivation of the strawberry on a large scale, having prepared—trenched or subsoiled and manured,—the ground, let the *new plants* (so called) be set out in rows three or three and a half feet apart, and at any distance from each other in the row, from two or three inches to as many feet, according to the supply of the plants.

* This variety is increased by dividing the roots. It may also be reproduced by sowing the seed as soon as it is ripe.

The cultivation of the ground between the rows, the first season, may be chiefly performed with a horse and cultivator. Keep the plants well hoed and clean of weeds, remembering always *that the oftener they are cultivated and wed, the less the labor will cost*; for if the beds get once choked with weeds and grass, it will be found a sorry job to clean them. Train the runners the first season lengthwise of the rows. In the autumn of each year, it is an excellent plan to apply a little top-dressing of compost-manure, leaves or old rotted straw to the beds, in quantities nearly sufficient to hide the plants. The next season, the vines will spread so that it will hardly be practicable to go among them with the horse and cultivator. The plants, this and the next year, must be wed chiefly by hand. The vines will bear quite a moderate crop the first season, and their best crops during the second and third summers from their planting out. On the third or, at farthest, on the fourth spring after setting them, dig up all the old plants and throw them away; for their fruit-bearing days are over. If it is not a particular object to increase the number of plants, the number and size of the berries may

be increased, by cutting off the runners two or three times, during the second and third summers after they were planted out.* As soon as the blossoms have set their fruit, it is an excellent plan to carefully weed the plants and then cover the whole ground, under and around the vines, with a good quantity of old straw. This is beneficial to the growth of the plants, as a *mulching*, and protects the ripening fruit from the dirt. The vines thus treated need no further hoeing or weeding, until they have done fruiting.

An English writer recommends a fine substitute for this common practice. Have cheap tiles made, say twelve inches long and six inches wide, with a semi-circular notch in one side of each, so that when two are laid together there will be formed a round hole between them of about four inches diameter.

Place these, instead of the straw, around every bearing plant, so as to cover the whole ground. The weeds cannot grow under them, and they will keep the berries clean and hasten their maturity.

The cost of these tiles would be but trifling

* This is, in fact, a kind of *shortening-in*, similar to that practiced upon the peach, grape, &c.

and we think they would answer a good purpose here.

“*To accelerate the ripening* of strawberries,” says Downing, “it is only necessary to plant the rows or beds on the south side of a wall or tight fence. A still simpler mode is to throw up a ridge of earth three feet high, running east and west, and to plant it in rows on the south side.” Ten days or more may be gained in this way; and if later fruit is desired, rows planted on the north side would probably have their fruiting retarded nearly as much.

Cultivation in Alternate Strips.—This is an easy mode of renewing the plants, considerably practiced near Boston. On the third summer from planting, suffer the runners to grow and root into the spaces between the rows.—(See above, *Setting in Rows*;)—then, in the fall or spring, dig up the old plants and your new rows are already formed in what were last year the spaces between the rows. At the end of three years, repeat the process and so on, not forgetting to spade in a generous quantity of compost manure whenever you dig up the old rows.

The Bush Alpine. Strawberries, having

no runners, are the prettiest to cultivate in hills or in borders; and they produce considerable fruit, even until the setting-in of the frosts of autumn.

Some cultivators allow their vines to cover the whole ground; others quite as successfully keep them very neatly in hills. The *essential* requisites are—

1. Selection of proper varieties;
2. A deep rich soil;
3. Seasonable destruction of weeds;
4. A renewal of the plants once in three or four years.

II. CHARACTER OF STRAWBERRY BLOSSOMS.

There is another very important feature, in the management of the strawberry, which ought not to be passed over. Strawberry plants of different varieties—(some think even of the same variety,)—produce three kinds of blossoms, the *staminate* or male, the *pistillate* or female, the *hermaphrodite* or perfect blossoms.

The Cincinnati cultivators have practically proved, that the former two varieties produce their largest crops when growing in proximity to each other. Thus, in making a plantation

of the strawberry, they set every fourth or fifth row with *staminate*, and the intermediate rows with a *pistillate* variety, one plant of the former being sufficient to fertilize five or ten pistillate plants.

The success which has practically attended this mode of culture, justifies us in strongly recommending it to all who raise the strawberry either upon a small or a large scale. We should prefer this mode to that recommended by Downing, which is to select the *new plants*, for forming a bed, from the runners of those older plants which have distinguished themselves by their productiveness.

Of nearly a hundred varieties described in the catalogues of nurserymen, we shall here recommend only a very few.

Those who wish to cultivate the strawberry, not for fancy, but for the size, beauty, excellence and productiveness of its fruit, cannot do better, in our climate, than to plant out first a row of the *Large Early Scarlet* (a staminate * variety,) then four or five rows of the *Hovey's Seedling* (a pistillate variety,) in the manner above described under *Setting in Rows, and Character of Strawberry Blossoms*.

* "Sometimes, perfect"—Downing.

Other fine staminate varieties for our climate are, the *Old Scarlet* (or *Early Virginia Scarlet*,) and the *Hautbois*. Another capital large fruited pistillate variety is the *Black Prince*. The *Hudson's Bay* is a fine, hardy, rather late variety.

For perfect-blossomed plants there are none better than the *Red-fruited* and *White fruited Alpines*. These continue in bearing from June till November. A large autumn crop may be secured, by cutting off the blossoms in the spring.

The *Red Wood* and the *White Wood* are also hardy perfect-blossomed varieties, ripening their fruits in July; they are well worthy of cultivation.

The perfect-blossomed varieties, of course, need no intermingling of other plants to render them fruitful.

Gathering the Fruit. Gather the fruit when it is not moist with dew or rain. It may be kept for a little while, by placing it in a cool dry room or in an ice-box.

Uses of the Fruit, &c. The strawberry is a dessert fruit of the first rank. It is sometimes used also for preserving. Boerhave considered it a valuable remedy in cases of

putrid fever. Hoffman asserts that he has known consumptive people cured by the use of this fruit.

Eaten plentifully the strawberry averts rheumatic complaints. It also dissolves the tartarous incrustations on the teeth. We are very sorry that we feel obliged, also, to tell our cold-water friends, that an agreeable dessert wine may be made from this exquisite fruit.

Downing eulogises the strawberry as "the most delicious and wholesome of all berries," and after quoting from a northern bard,

"A dish of ripe strawberries, smothered in cream,"

which he calls a perfect *pastoral idyl* in itself, he boldly doubts the existence of any individual who does not relish the fruit.

The cultivation of the strawberry for market is not an unprofitable business. Six thousand bushels of the fruit are annually sold in the city of Cincinnati. Some of the West Cambridge gardeners have sold in Boston, during a single season, from \$700 to \$1000 worth of strawberries from *less than an acre of land!*

Size of the Fruit.—The Hovey's Seedling attains, on an average, the size of three to

three and a half inches in circumference. Specimens have been raised, by high cultivation and thinning the fruit, as large as five or even six inches in circumference.

The largest Strawberry of which the writer has any information,—(*See Farmer's Library, page 186, Oct. No. of 1845.*)—was raised in 1845 at Doddington Hall in England. The specimen was of the *British Queen* variety. It was *nine inches in circumference* laterally, and *six inches in circumference* through the stem and point,—being about the size of a fair specimen of the Baldwin apple. This is a most striking exemplification of what nature *can* do, when assisted by the cunning ingenuity of human skill; for, doubtless, that which wins our admiration, in the *British Queen*,—meaning, of course, the strawberry,—is the result, chiefly of cultivation and assiduous training for successive years;—just what might have been effected with any other of that little ignoble, uncultivated tribe, so quaintly described by Gerarde.*

* "Strawberries do grow upon hills and valleies. likewise in woods and other such places that bee something shadowie."

HERBALL, p. 485.

SECTION II.

THE CURRANT.

The Currant will grow in any soil that will produce corn or potatoes. It is more easily cultivated than any other fruit. The best mode of propagating the currant, is by planting out cuttings of it, in the fall, or quite early in the spring. (*See Chap. 2d, of Part I.*) It is well to procure the cuttings in the fall and keep them like scions until spring.

Tree and Bush Currant. By taking out all the eyes of a cutting except the three or four upper ones, currants can easily be kept in the form of little trees. By leaving all the buds on the cutting, or by propagating by dividing the roots, the plants will assume quite a bushy habit. Downing prefers the *tree* mode of culture; but we very much prefer the *bush* mode. We have never seen tree-formed currants so healthy and vigorous as those grow-

ing in the old fashioned way, although we admit that, while they live, they yield very large fruit and appear very pretty. It is an excellent plan to renew currant bushes, once in six or eight years.

When you desire extra sized fruit, pinch off the ends of the growing shoots about the 20th of June, and thin out the clusters just as you would to produce the same result with the grape. No further treatment is necessary, except to keep the ground around the bushes well cultivated and free from weeds, and to prune out the superfluous wood every winter.

The best varieties of a reputation well established here, are the large Red Dutch and the large White Dutch. Other fine, large varieties, highly recommended by those who have cultivated them, are Knight's Early Red, Knight's large Red, and the Victoria (a very large, fine currant.) These are nearly twice the size of the common red and white currants and are in every respect superior to them.

Of *Black Currants*, the Black Grape is one of the best. People who have *acquired* a fondness for this species of the currant, often place a high value upon it.

Uses of the Currant. The currant, stewed

while yet green, is an excellent article for tarts, sauces, pies, &c. As a dessert, the white varieties being less acid are preferred by most people. The white and red kinds are very pretty, when mixed together upon a glass dish or salver. Wine is also made from the currant; and frequently this is a no contemptible beverage. Fine jellies are made both of the red and the white varieties. When white currants are to be made into jellies, use the whitest sugar that can be obtained.

SECTION III.

THE GOOSEBERRY.

The Gooseberry requires a *deep*, strong rich soil. It is propagated precisely in the same way as the currant. The *tree*-gooseberry succeeds better than the tree currant, and nearly as well as the bush form of the plant. The plants should also be renewed, as directed for the currant. The uses of the gooseberry are the same as of that fruit.

Pruning. One half of the top of a gooseberry bush, should be thinned out at the winter pruning, so as to admit light and air through the head of the plant. When the berries are fairly set, thin them out, taking away one half or more of them, for the benefit of the rest.

Mildew. The best preventive and remedy for this, is to keep the plants well manured and pruned every year.

The following varieties are recommended by Downing and others: *Red*—Keen's Seedling, Crown Bob, &c.; *White*—Early White, White Honey, &c.; *Yellow*—Yellow Ball, &c.; *Green*—Green Walnut, Pitmaston, Green Gage, &c.

SECTION IV.

THE RASPBERRY.

The Raspberry is indigenous both in Europe and America.

Soil. Downing recommends "a deep rich loam, rather moist than dry." Kenrick says "a moist rich soil." Thomas recommends the same, with "an admixture of swamp muck." *Uses.* The fruit has the same use.

Cultivation. The raspberry is universally propagated by suckers or offsets from the main roots. A few varieties are raised by means of layers. They need the same cultivation as the currant.

Pruning. All dead wood and the smaller stems should be cut away, in the spring, even with the ground. Four or five shoots should be left, and tied to a stake, the tops having about one foot of their upper extremities headed off. Set the plants in rows, three or

four feet apart each way. The raspberry plant is in perfection, when it is three years old. When it is about six years old, it should be dug up and a new plantation made, on a piece of ground where the plant has not recently grown before. It is an excellent mode to make a small plantation every year, so as to continue a supply of the fruit. In extreme cold latitudes, it is necessary to bend the plants down and cover them with earth or straw through the winter.

Varieties. White Antwerp, Red Antwerp, Fastolff, and Franconia are the best for New England; the latter is the hardiest.

Uses. The fruit has the same uses as the currant. Plantations of the Raspberry for the supply of the market, have been made almost as profitable as those of the strawberry. This fruit like the strawberry, is also wonderfully susceptible of improvement by cultivation.

the first year each way. The raspberry
plant is in perfection when it is three years
old. When it is about six years old, it should
be dug up and a new plantation made, on a
piece of ground where the plant has not re-
sided too long. It is an excellent mode
to have a small plantation every year, so as
to have a supply of the fruit. In extreme
cold countries, it is necessary to bend the
canes down and cover them with earth or
straw throughout the winter.

Propagation. White and black raspberries
are propagated by cuttings, and the best for New
England is the former of the two.

Planting. The fruit has the same uses as the
strawberry.

Uses. The raspberries for the supply
of the market are now raised almost ex-
clusively in the State of New York, and
the fruit is sold in the summer months
at a high price.

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