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THE

NEW AMERICAN GARDENER,

CONTAINING

Practical Directions

ON THE CULTURE OF

FRUITS AND VEGETABLES;

INCLUDING

LANDSCAPE AND ORNAMENTAL GARDENING, GRAPE-VINES, SILK, STRAWBERRIES, &c. &c.

BY THOMAS G. FESSENDEN,
EDITOR OF THE NEW ENGLAND FARMER.

God Almighty first planted a *Garden*; and indeed it is the purest of human pleasures: it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handy-works. Bacon's Essays.

NINETEENTH EDITION.

BOSTON:
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THOMAS, COWPERTHWAITE, & CO.
1847.

DISTRICT OF MASSACHUSETTS, *to wit*,

District Clerk's Office.

BE IT REMEMBERED, That on the eighteenth day of July, A. D. 1828, in the fifty third year of the Independence of the United States of America, J. B. Russell, of the said district, has deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"The New American Gardener; containing practical Directions on the Culture of Fruits and Vegetables; including Landscape and Ornamental Gardening, Grapevines, Silk, Strawberries, &c. &c. By Thomas G. Fessenden, Editor of the New England Farmer.

"God Almighty first planted a Garden; and indeed it is the purest of human pleasures: it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handy-works.—Bacon's Essays."

In conformity to the act of the Congress of the United States, entitled, "An Act for the encouragement of learning, by securing the copies of maps, charts, and books to the authors and proprietors of such copies during the times therein mentioned;" and also to an act, entitled, "An Act supplementary to an act, entitled, An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned; and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

JNO. W. DAVIS,

Clerk of the District of Massachusetts

TO THE

HON. JOHN LOWELL, LL. D.

PRESIDENT OF THE MASSACHUSETTS SOCIETY FOR THE PROMOTION OF AGRICULTURE, &c. &c.

SIR,

THE compiler of the NEW AMERICAN GARDENER is happy to inscribe it to a gentleman, whose enlightened zeal, and disinterested efforts to promote the art to which it is devoted, have rendered such dedication so very appropriate. Please to accept of it, not only as a grateful acknowledgment of favours received, but a slight, though sincere, indication of the writer's high opinion of the value of your indefatigable exertions to encourage and enlighten the pursuits of the Husbandman and the Horticulturist; vocations, which, as they are first in the order of civilization, should, in every civilized country, be considered as of the first importance to the best interests of its inhabitants.

With the highest esteem,

your much obliged,

and most obedient servant,

THOMAS G. FESSENDEN.

With regard to the following pages, the Compiler begs leave to observe, that utility has been his sole object. He has no pride of authorship to sustain, nor new theories to establish. The work is nothing more than a humble attempt to render some service to cultivators, by collecting and condensing, from various sources, such directions, notices, and observations, relating as well to field as to garden culture, as seemed of most importance in practice.

We would here express our gratitude to gentlemen who have favoured us with articles for this work, which must not only greatly enhance its value, but, it is hoped, will atone, in some measure, for the faults and imperfections of those parts, for which the Compiler alone is responsible. The papers to which we allude have the following heads or titles, viz. "Flowers, Ornamental," 109; "Fruits," 128; "Landscapes and Picturesque Gardens," 184; "Silk," 268; "Strawberry," 285; and "Vine," 294. The two last mentioned articles were from the pen of the same gentleman; and that on the Vine, having been originally published in the *Massachusetts Agricultural Repository*, has been republished and recommended in other scientific journals, as forming a complete manual for the culture of the grape.

NEW AMERICAN GARDENER.

INTRODUCTION.

THE importance and utility of HORTICULTURE, or the art of cultivating those products of the soil which are used in domestic economy, require no elaborate exposition. The greatest blessings which a kind Providence can bestow on man, in his sublunary state of existence, are, health of body and peace of mind; and the pursuits of gardening eminently conduce to these. Gardening was the primitive employment of the *first man;* and the *first of men*, among his descendants, have ever been attached to that occupation. Indeed, we can hardly form an idea of human felicity, in which a garden is not one of its most prominent characteristics.

Gardening is not only an innocent and healthy, but a profitable occupation. It is not alone by the money which is *made*, but also by the money which is *saved*, that the profits of a pursuit should be estimated. Where a good garden constitutes part of a rural establishment, and the culinary uses of its productions are well understood, the field or the market furnishes a proportionably small part of the provisions necessary for family consumption. "I consider," said Dr. Deane, "the kitchen garden of very considerable importance, as pot-herbs, salads, and roots of various kinds, are useful in house-keeping. Having a plenty of them at hand, a family will not be so likely to run into the error, which is too common in this country, of eating flesh in too great a proportion for health. Farmers, as well as others, should have kitchen gardens; and they need not grudge the labour of tending them, which may be done at odd intervals of time, which would otherwise chance to be consumed in needless loitering."

Cowley says of gardening, "It is one of the best-natured delights of all others, for a man to look about him, and see nothing but the effects and improvements of his own art

and diligence; to be always gathering some fruits of it, and at the same time to behold others ripening, and others budding; to see his soil covered with the beauteous creatures of his own industry; and to see, like GOD, that all his works are good."

We shall here state, concisely, some of the principal prerequisites for successful horticulture, directing our observations, chiefly, to what relates to the kitchen garden. Gardens are usually classed under the following heads:—the *kitchen garden;* the *fruit garden;* and the *flower garden.* The flower garden, being designed principally for ornament, should be placed in the most conspicuous part, that is, in front, or next to the back part of the house; the kitchen garden and fruit garden may follow in succession. With respect to the natural situation of a garden, Nicol and Forsyth agree in preferring a gentle declivity towards the south, a little inclining to the east, to receive the benefit of the morning sun. "A kitchen garden," observed Dr. Deane, "should not be situated at any great distance from the house, lest, being too much out of sight, it should be out of mind, and the necessary culture of it too much neglected." It should be placed adjoining to a stable, whence the dung may be easily conveyed into the enclosure. It should be sheltered, as much as can be, from the north and east, to prevent the blighting winds from affecting the trees. The best soil for a garden is a sandy loam, two or three feet deep, according to Forsyth; but if deeper, the better. The earth should not be of a binding nature in summer, nor retentive of rain in winter, but of such a texture that it can be worked at any season, when not frozen, without difficulty."

Dr. Deane observed, that "a garden should have a close fence, that the winds may not drive seeds of weeds into it. The fence should be at least seven feet high, and picketed to prevent the entrance of thieves. The height and closeness of the fence will increase the vegetation by increasing the warmth of the air in the garden, excepting, perhaps, the parts which are shaded by the fences. The rage of high winds will be so opposed as to prevent the tearing and distorting of tender plants, and fowls may be more easily kept out." Loudon remarks, that "the height of walls for training fruit trees, generally approved, is from ten to twelve feet; but it is more commonly determined by the

size and form of the garden, and the inclination of its surface." "Many low walls, or stout ranges of paling," Abercrombie observes, "will produce a greater total effect, in accelerating fruit, than the same expenditure in high walls." "Fruit walls, five or six feet high," Hitt remarks, "will do very well for peaches, cherries, vines, and figs; but he would not advise the planting of apricots, plums, or pears, on such walls, they requiring more room, and to stand longer before they bear. Garden walls have been coloured white or black, and the latter colour is justly preferred as absorbing and refracting more heat than any other, and thereby accelerating the maturity, and improving the quality of fruits."—*H. Dawes*, in *Hort. Trans.* vol. iii. p. 380.

To assist in determining the extent of a garden, Marshall observes, that *an acre*, with wall trees, hot beds, &c. will furnish employment for one man, who, at some busy times, will need assistance. Loudon says, "To give some rules for the quantity of ground to be laid out, a family of four persons, (exclusive of servants,) should have *a rood* of good-working, open ground, and so in proportion." Mr. Armstrong obsefves, that "The size and shape of the kitchen garden are not indifferent, but admit of no positive rules for their regulation, because depending on circumstances rarely alike in two cases—the nature of the ground, and the wants and ability of the occupier. On these heads, therefore, we only say, that a parallelogram and a square are the forms most approved, because most susceptible of a cheap, easy, and regular arrangement into beds; and that *two acres*, devoted to the culture of table vegetables, will furnish an abundant supply, for even a large family."

"The ground is next to be divided into quarters, the size of which ought to be proportioned to the extent of the garden; because, if these divisions be too small, the soil will be wasted in walks; and as the quarters are generally enclosed by espaliers of fruit-trees, the vegetables which may be planted there will not thrive, for want of sufficient exposure. The walks should, therefore, be proportioned to the size of the ground; and in a small garden, they ought not to exceed eight feet; or, if it be a large one, from twelve to fourteen feet in breadth. It will also be advisable to place a border, three or four feet wide, between such wall and the espalier, in which may be sown small salads, or any similar vegetables, that do not take deep root, or continue

long in the ground. These quarters, however, ought not to be planted or sown, for raising the same crops, two successive years; and the warmest soil, or that which is next to the stable, where it is best sheltered from the cold winds, will be the most proper for hot-beds, to promote the growth of early cucumbers, melons, &c."—*Dom. Encyc.*

A copious supply of water is very essential to a good kitchen garden. Loudon remarks, that "Many kitchen crops are lost, or produced of very inferior quality, for want of watering. Lettuces and cabbages are often hard and stringy; turnips and radishes do not swell; onions decay; cauliflowers die off; and, in general, in dry seasons, all the *cruciferæ* become stinted or covered with insects, even in rich, deep soils. Copious waterings in the evenings, during the dry seasons, would produce that fulness and succulency which we find in the vegetables produced in the Low Countries, and in the Marsh Gardens at Paris, and in England at the beginning and latter end of the season. The vegetables brought to the London market, from the Neat's Houses and other adjoining gardens, where the important article of watering is much more attended to than in private country gardens, may be adduced as affording proofs of the advantage of the practice.

"The contrivance for watering or washing the foliage of the wall trees in Dalmeny garden, laid out by that excellent horticultural architect, John Hay, deserves particular notice. Water is supplied to the garden from a reservoir, situated on an eminence, a considerable height above the garden walls. Around the whole garden, four inches below the surface of the ground, a groove, between two and three inches deep, has been formed in the walls, to receive a three quarter inch pipe for conducting the water. About fifty feet distant from each other, are apertures through the wall, two feet and a half high, and ten inches wide, in which a cock is placed, so that, on turning the handle to either side of the wall, the water issues from that side. The nozles of the cocks have screws on each side, to which is attached, at pleasure, a leathern pipe, with a brass cock and director; roses, pierced with holes of different sizes, being fitted to the latter. By this contrivance, all the trees, both inside and outside the wall, can be most effectually watered and washed in a very short space of time, and with very little trouble. One man may go over the whole

in two hours. At the same time, the borders, and even a considerable part of the compartments, can be watered with the greatest ease when required. The convenience and utility of this contrivance must at once be perceived by every practical horticulturist. The same plan of introducing water is adopted in a garden, which J. Hay planned and executed for Lord V. Duncan, at Lundie House, near Dundee; and, after the experience of several years, it has been greatly approved of. The water at Lundie is conveyed to the garden from a considerable height, and is thrown from the point of the director with great force, and to a good distance."—*Endin. Encyc.* art. HORTICULTURE.

"Vegetables that are newly transplanted, as they have their roots more or less diminished, or otherwise injured, often need watering, until they have taken new root. But this should be done with caution. If a dry season follow the transplanting, let them be watered, if they appear to droop, only at evenings, and in cloudy weather, and with water which has been exposed, one day at least, to the shining of the sun; not with water directly from a well, or a cold spring, as it will give a chill to the plants. Only a small quantity should be applied at once, that it may have an effect similar to that of a refreshing rain; for water, applied too plentifully, sometimes washes away the finest of the mould from the roots, or makes little cavities about them, which admit too much air.

"In a dry season, whole gardens sometimes need watering; and, in doing it, the above precautions should be regarded. They are happy, who have a piece of standing water in their garden, or a rivulet near at hand, from whence the garden may be watered without much labour."—*Deane.*

In laying out the compartments of a garden, Forsyth observes, "You must be guided, in a great measure, by the form and size of the garden; but do not lay them out too small, as, in that case, a great part of the ground will be taken up with walks and borders. The best figure is a square, or oblong, when the garden is of that form; but if not, they may be laid out in any other figure that is thought to be most convenient." Some of the compartments, in some of our best gardens, Neill observes, are laid out in beds four feet wide, with narrow alleys. So many alleys, no doubt, occupy a deal of room; but advantages of conve-

niency and neatness in enabling the workmen to clean and gather the crop, without trampling the ground, seem to compensate the sacrifice of space. For currant, gooseberry, and raspberry bushes, the compartments are, of course, reserved undivided; and narrow beds are unnecessary in the case of large perennial plants, such as artichokes or rhubarb.

Abercrombie recommends the borders next the walls to be made of prepared soil, "from eight to twelve feet wide, and the same description of soil extended under the walks, in order to allow a liberal width for the roots to spread without impediment. Next to the borders, leave a space for a walk entirely round the garden, from four to six feet wide. Some persons, also, choose to have a border on the inward side of the walk, for the cultivation of espaliers, and esculents of a dwarf growth; others divide the central parts at once into main compartments or divisions. The walks or alleys must be regulated by convenience of access. Where the ground is extensive, the centre should be traversed by a walk, with parallel borders, from which cross-walks may branch, if necessary." The borders under the walls, Forsyth observes, "should, in the inside, be from ten to twenty feet wide, according to the size of the garden, to give full liberty for the roots of the trees to spread. There should be a foot-path, about two feet and a half from the wall, for the greater convenience of nailing the trees, gathering the fruit, &c. This walk should be from two to two feet and a half wide, (to admit a barrow or barrow engine for watering the trees,) and covered with sand, or, which is better, coal-ashes, about two or three inches thick, but without any gravel or rubbish below." "The borders for wall trees," according to Nicol, "should not be less than twelve feet in breadth; but fifteen or eighteen feet is not too much: that is to say, the soil should be prepared for these breadths, if it be not naturally good, and perfectly answerable for the different kinds of trees to be planted." —See further *Encyc. of Gard.* p. 474.

The above directions are mostly copied and abridged from European writers on horticulture, of established reputation. They may, perhaps, prove of use to American gardeners, though they may not apply, in their full extent, to the soil, objects of culture, &c. of any individual cultivator. Useful hints may be gathered from precepts, which, taken in the aggre-

gate, it would be the height of absurdity to be guided by It was well remarked, in a little work, lately published, entitled *Economy of the Kitchen Garden*, &c. by William Wilson, of New York, that "The word *garden*, considered in its most extensive point of view, embraces such a multiplicity of subjects, which properly come within its range, that people are very apt to enter upon the formation and cultivation of one under a very disadvantageous and erroneous impression of the impracticability of having one of any value upon a small scale; or at any thing short of a great expense and labour. Whereas, the truth of the matter is, that the most valuable part of all gardening, the raising of esculent vegetables, is an employment the most easily accomplished by those who are possessed of the hands of industry." A man may raise garden vegetables, fruits, &c. and receive benefit, as regards their culture, from books on horticulture, without possessing any of the requisites of what is technically called *a garden*.

FRUITS AND VEGETABLES,

ALPHABETICALLY ARRANGED.

APPLE.—*Preservation of apples.*—Apples keep best in a low temperature, and may be well preserved in an ice-house. An English journal recommends the use of dry pit sand for preserving pears and apples. Glazed earthen jars are to be provided, and the sand to be thoroughly dried. A layer of sand an inch thick is then placed in the bottom of the jar; above this a layer of fruit, to be covered with a layer of sand an inch thick; then lay a second stratum of fruit, covering again with an inch of sand. An inch and a half of sand may be placed over the uppermost row of fruit. The jar is now to be closed, and placed in a dry situation, as cool as possible, but entirely free from frost. Some assert that apples may be kept in casks through the winter, in a chamber or garret, by being merely covered with linen cloths. Apples, which are intended for winter's use, should be suffered to hang on the tree as long as they are safe from frost.

Cobbett says, "To preserve apples in their whole state, observe this, that *frost* does not much injure them, provided they be kept in *total darkness* during the frost, and until they be used; and provided they be perfectly *dry* when put away. If put together in large parcels, and kept from the frost, they *heat*, and then they *rot;* and those of them that happen not to rot, lose their flavour, become vapid, and are, indeed, good for little. This is the case with the Newtown pippins that are sent to England, which are half lost by rot, while the remainder are poor, tasteless stuff, very little better than the English, the far greater part of which are either sour or mawkish. The apples thus sent have every possible disadvantage. They are gathered carelessly, tossed into baskets, and tumbled into barrels at once, and without any packing stuff between them: the barrels are flung into

and out of wagons; they are rolled along upon the pavements; they are put into the hold, or between the decks; and is it any wonder, that a barrel of *pomace*, instead of *apples*, arrives at Liverpool or London! If, instead of this careless work, the apples were gathered, (*a week before ripe;*) not bruised at all in the gathering; laid in the sun on boards or cloths three days to let the watery particles evaporate a little; put into barrels with fine cut straw-chaff, in such a way as that no apple touched another; carefully carried to the ship, and put on board, and as carefully landed; if this were the mode, one barrel, though it would contain only half the quantity, would sell for as much as, upon an average, taking in loss by total destruction, twenty barrels sell for now. On the deck is the best part of the ship for apples; but, if managed as I have directed, between decks would do very well. In the keeping of apples for market or for house use, the same precautions ought to be observed as in gathering and laying out to dry; and, perhaps, to pack in the same way, also, is the best mode that can be discovered.

"Dried apples is an article of great and general use. Every body knows that the apples are peeled, cut into about eight pieces, the core taken out, and the pieces put in the sun till they become dry and tough. They are then put by in bags or boxes in a dry place. But the flesh of the apple does not change its nature in the drying; and, therefore, the finest, and not the coarsest apples should have all this trouble bestowed upon them."

The following valuable observations, contained in a letter from Noah Webster, Esq. have been published in the *Massachusetts Agricultural Repository*:—

"It is the practice with some persons to pick apples in October, and first spread them on the floor of an upper room. This practice is said to render apples more durable, by drying them. But I can affirm this to be a mistake. Apples, after remaining on the trees as long as safety from the frost will admit, should be taken directly from the trees to close casks, and kept dry and cool as possible. If suffered to lie on a floor for weeks, they wither and lose their flavour, without acquiring any additional durability. The best mode of preserving apples for spring use, I have found to be, the putting them in dry sand as soon as picked. For

this purpose, I dry sand in the heat of summer, and late in October put down the apples in layers, with a covering of sand upon each layer. The singular advantages of this mode of treatment are these:—1st. The sand keeps the apples from the air, which is essential to their preservation. 2d. The sand checks the evaporation or perspiration of the apples, thus preserving in them their full flavour; at the same time, any moisture yielded by the apples (and some there will be) is absorbed by the sand: so that the apples are kept dry, and all mustiness is prevented. My pippins in May and June are as fresh as when first picked; even the ends of the stems look as if just separated from the twig."

Apples, it is said, may well be preserved by packing in any kind of grain; also in paper cuttings of the book-binder; or in shallow pits, between layers of turf, the grassy side inwards, with a sufficient covering of straw and earth to protect them from frost; likewise in dry flax-seed chaff, or pulverized plaster of Paris.

A letter from Ebenezer Preble, Esq. published in the *Massachusetts Agricultural Repository*, Vol. iv. No. i. p. 24, contains the following useful directions on this subject:—"The general method of gathering apples for cider, is, shaking the tree, and thrashing the branches with poles. The former will answer when the fruit is at maturity; they will then drop without injury to the buds. Poles should never be used but with a hook at the end, covered with cloth or matts to prevent wounding the bark; they then serve to shake the small limbs. Particular attention is required in gathering winter fruit. They should be taken in the hand, the fingers placed at the foot stalk, and, by bending it upwards, the fruit is gathered with ease, and without injury; they should be moved from the gathering baskets with great care," &c. The same writer says, "The injudicious method practised in gathering fruit, is more destructive in its consequences, than is generally understood; the blossom buds of the succeeding year are placed at the side of the foot stalk of the fruit, and if the spurs are broken, no fruit on that part will be produced."—*See further*, FRUIT.

Use.—For pies, tarts, sauces, and the dessert, the use of the apple is too well known to require description. In France, bread is made consisting of one third of boiled apple

pulp, baked with two thirds flour, properly fermented with yeast for twelve hours. This bread is said to be very fine, full of eyes, and extremely palatable and light. Apples, by furnishing cider, a grateful and salubrious liquor, have a tendency to diminish the consumption of ardent spirits. Besides, apples are thought to alter and ameliorate the taste and the tone of the human system, in such a manner as to destroy that artificial appetite, which is gratified by the deleterious preparations of alcohol. "The palate," says Mr. Knight, a celebrated English horticulturist, "which relishes fruit, is seldom pleased with strong fermented liquors; and as feeble causes, continually acting, ultimately produce extensive effects, the supplying the public with fruit at a cheap rate, would have a tendency to operate favourably, both on the physical and moral health of the people." In medicine, verjuice, or the juice of crab-apples, is used for sprains, and as an astringent and repellent. The good table apple, when ripe, is laxative; the juice is useful in dysenteries; boiled or roasted apples fortify a weak stomach. "Scopoli," says Loudon, "recovered from a weakness of the stomach and indigestion from using them; and they are equally efficacious, in putrid and malignant fevers, with the juice of lemons or currants." "In diseases of the breast," says Dr. Willich, *(Dom. Ency.)* "such as catarrhs, coughs, consumptions, &c. they are of considerable service. For these beneficial purposes, however, they ought not to be eaten raw, but either roasted, stewed, or boiled. They may also be usefully employed in decoctions, which, if drank plentifully, tend to abate febrile heat, as well as to relieve painful strictures in pectoral complaints."

Apples have also been recommended as food for horses and farm stock, for which purpose sweet apples are of the greatest value.—*See N. E. Farmer*, vol. v. p. 82. Sweet apples are said, likewise, to afford a saccharine matter, which is a good substitute for molasses. For this purpose the apples are ground and pressed in a cider mill, and the juice boiled immediately, the scum being taken off till it is reduced to a proper consistence.

The following process for making apple jelly has been recommended:—Pare and quarter the apples, and remove the core completely. Then put them into a pot, and place it in a heated oven, or over a slow fire. When well stewed,

squeeze out the juice through a cloth, to which add a little of the white of an egg. Boil it to a proper consistence, skimming just before it begins to boil.

APPLE-TREE.—*Pyrus malus.*—In propagating the apple-tree, the common method in New England has been to sow the pomace from late made cider, without regard to the quality of the apples producing the pomace. But we doubt very much whether this is the best mode of raising this valuable fruit-tree. The seeds for a nursery should, we think, be selected from the best varieties of apples which can be procured; and this for the simple reason that "like produces its likeness." It is as expedient to propagate from the best individuals of the vegetable as of the animal creation. In proof of this theory, we would cite the following from a communication to Dr. Mease of Philadelphia, addressed to him by Mr. Joseph Cooper, of New Jersey, an accurate observer and scientific cultivator:—

"Experience for more than fifty years has convinced me that, although seedlings from apples will scarcely ever produce fruit, in New Jersey, exactly similar to the original, yet many of them will produce excellent fruit; some will be even superior to the apples from which the seeds were taken. This fact has led me to plant seeds from the largest and best kinds of fruit, and from trees of a strong and rapid growth, and to let all young trees bear fruit before grafting, which produced an uncommonly strong shoot, or large, rich looking leaf. I have seldom known them fail of bearing fruit having some good quality; at all events, they make stocks to put any good kind on, which may afterwards present itself."

Loudon observes, that "the apple, like most other hardy trees, may be propagated by seeds, cuttings, suckers, layers, or engrafting; by seeds, for obtaining new varieties, and by the other modes for continuing such as are in esteem. The seeds should be taken from fruits having the properties it is desired to perpetuate or improve in the greatest degree. In collecting seeds to sow, it must be remembered that the habits as well as the diseases of plants are often hereditary, and attention should be paid to the state of the tree from which the seeds are taken; it should be large, and of free growth, and rather in a growing state than one of maturity or decay."—*See* CUTTINGS, ENGRAFTING, LAYERS, NURSERY, ORCHARD, SCIONS, *in their alphabetical order.*

Manure for apple-trees.—Rotten leaves of trees are recommended by Forsyth as the best manure for fruit-trees, which, he says, is "much better than dung, which I by no means approve of for trees, unless it be perfectly rotten, and mixed up with mould. It is better, however, not to make use of such leaves as manure for fruit-trees unless it be perfectly rotten, and reduced to a fine vegetable mould."—*Forsyth's Treatise on Fruit-Trees*, pp. 62, 63, *American edition.*

Use.—Besides the uses to which the fruit of this valuable tree is applicable, the bark will produce a yellow colour, and the wood is used in turning and various purposes, where hardness, compactness, and variegation of colour are objects.

APRICOT.—*Prunus Armeniaca.*—The apricot-tree may be procured from the stone, like the peach; and approved sorts are perpetuated by budding, either on their own stocks or on plum stocks. They require the same sort of treatment as the peach and nectarine tree. The soil, which suits them best, is a rich black mould, according to some writers, but others recommend a light loam. "In our climate," says Dr. Thacher, "this tree should be screened from easterly and northerly winds; otherwise, it is said, they will not bear fruit, though they may grow very large. They do not attain to a bearing state so soon as the peach by one year. Some kinds ripen their fruit much earlier than others. The following are those best adapted to our climate:

The black apricot,	The large early apricot,
The Brussels apricot,	The peach apricot,
The Breda apricot,	The Moor's Park apricot,
The early apricot,	The Turkey apricot.

ARTICHOKE.—*Cynara scolymus.*—There are, according to Loudon, three varieties cultivated—conical, French, or oval artichoke, with green head. The head is oval, the scales open, and not turned in at the top, as in the globe sort. Globe, or largest, with dusky, purplish head. The scales are turned in at top, and the receptacle more succulent than the other. The dwarfish globe, a prolific variety, and valuable as occupying little room with its head. The globe kind is the only one usually cultivated in this country.

In making new plantations, select deep, rich, light loam, not liable to retain much wet in winter, nor to be very dry

in summer. Let it have a gentle slope, sufficient to carry off any moisture that might lodge in the trenches between the rows, for that is more injurious to the roots in winter than the severest frost. Lay on a good quantity of rotten dung, and trench the ground eighteen inches deep, incorporating the manure well therewith, and thoroughly pulverizing the ground in digging; then proceed to slip off the young shoots from the mother stools, with all the roots and fibres they may have thrown out, and close the earth about the remaining shoots. These being provided, pull off any loose hanging leaves, and trim the fibres; then plant them with a dibble about four or five inches deep, in rows five feet asunder, and two feet apart in the row, leaving part of their green tops above ground, and the hearts of the plants free from any earth over them; be careful also to give each plant a little water to settle the earth about its roots.

Or, if you have seedling year old plants in a seed bed, you may take them up, and after shortening the tap roots a little, and dressing their leaves, plant them as above.

Subsequent culture.—"All spring and summer keep them clear from weeds, by occasionally hoeing between the plants; this, with regular waterings in the dry weather of summer, is all the culture which they require, till the season of production has terminated. They will produce some tolerable heads the same year in August, and thence till November; next year they will head sooner in full perfection. By having fresh stools planted every year or two, the old and new plantations together furnish a production of heads from June or July till November. Besides the main head, several smaller lateral heads generally spring from the sides of the stem in succession; but, in order to encourage the principal head to attain the full size, most of the side suckers should be detached in young growths, when their heads are the size of a large egg, which in that state are also prepared for some tables. As to the continuing main heads, permit them to have full growth till the scales begin to diverge considerably, but gather them before the flowers appear, cutting to each head a part of the stalk. When the entire crop on a stem is taken, cut off the stem close to the ground, to give the plant more strength for new shoots."—*Abercrombie.* "To encourage the production of large main heads, some detach

all the lateral heads in a young state. These are commonly in a fit state for eating raw, having attained about one third of their proper size; and they are for this purpose frequently sold in Covent Garden market, chiefly to foreigners. Another thing practised, with the same view, is the shortening the ends of the large leaves."—*Neill, in Ed. Encyc.*

Winter dressing.—Abercrombie says, "First cut down all the large leaves, but without hurting the small central ones, or the new shoots. Then dig the ground between and along each row; raising it gradually from both sides, ridgeways, over the roots, and close about the plants. In rigorous frosty weather, cover also in the litter, and close about each plant." Armstrong remarks, that "various means have been employed for preserving the outstanding plants during the winter. That which is most commonly used is, after stripping off the dead or decaying leaves, and trimming down the sound ones to three or four inches, to open trenches around the plant, and to draw about it the earth furnished by these. This is again covered with long dung or stable litter, so as entirely to exclude rain, and snow, and frost. But, in making those provisions against cold and wet weather, we must not forget, that it is possible to be careful overmuch; for if the mounds of earth and litter be large and close, we expose our plants to suffocation from want of air; to exhaustion from a continued vegetation, and to scorching, from the fermentation of the covering matter, which, if the weather be wet, and but occasionally warm, seldom fails to occur.

"To obviate these difficulties, it has been proposed, that the mounds be *gradually* formed; that the first covering be merely a wrapping of long dung, and that the additions made to it be conformed to the weather, leaving openings, in all cases, on its southern side, for the purposes of ventilation, and in no case to permit the covering to exceed two feet in thickness. But even this mode of treatment is not free from objection; for, first, the direct application of the dung to the plant will always alter its flavour, and very much degrade it; and again, the capriciousness of the weather does not generally give either warning of its changes, or time to accommodate ourselves to them; they often take place in the night, and often (whether in the night, or in

he day) under circumstances which prevent us from giving he plant the additional covering it may require. Two other methods, therefore, not dissimilar in themselves, have been suggested—the one to employ hollow cylinders of earthen ware, covered with a tile or piece of slate, and of capacity sufficient to embrace the plant; the other to form caps of straw, (such as are used for lodging bees,) and having a moveable top of the same material. To the last method we see no room for objection; in application it is easy, requiring no skill and but little labour, while the material and workmanship are both cheap and durable, and their property of excluding rain, snow and frost, not to be doubted."

Spring dressing.—"In spring, the litter and earth being removed in March or April, (April or May in this country,) according to the season, the stocks are examined; and two or three of the strongest or best shoots being selected for growing, the rest are removed by pressure with the thumb, or by a knife, or wooden chisel. Those shoots, or suckers, are used for new plantations. Dig the whole ground level, loosening it to the crown of the roots of every plant."—*Loudon.*

Duration of the plants.—"Artichoke plants continue productive for several years; but, every season, some well rotted dung, or fresh sea-weed, should be delved into the ground at the winter dressing. It is certain, however, that, after a few years, the plants begin to degenerate, the heads becoming smaller and less succulent. It is therefore a general rule, not to keep an artichoke plantation beyond four, or, at most, six years. Scarcely any kind of grub or wire-worm ever touches the roots of artichokes: they form, therefore, an excellent preparative for a crop of onions, shallot or garlic. In many gardens, a small new plantation is formed every year; and in this way the artichoke season, which begins in June, is prolonged till November; those from the old stock continuing till August, when those from the new stocks come in. If the last gathered be cut with the stems at full length, and if these be stuck among moist sand, the heads may be preserved a month longer.

Seed.—"The heads, when suffered to remain ten days, or a fortnight, after the season of cutting, expand the calix

leaves, and display an aggregation of jagged purple florets, producing a fine appearance. When ripe seed is wanted, those heads in flower are to be bent down, and retained in that position, so as that the calix may throw off the autumnal rains. In general, however, the seed is not perfected in our [the British] climate."—*Loudon.* Armstrong says, "Every gardener, who understands his trade, will take care to set apart a few of the finest heads of his own crop for seed; but, as the stock is upright, and the head so formed as to receive and hold water, it often happens that the seeds rot. To prevent this, the stems of the plants, so set apart, should be tied to stakes driven into the ground near them, and gradually bent, so as to give to the heads that degree of declination, that will be sufficient to carry off the water, that may fall upon them."

Use.—In England, the full heads only are eaten, always boiled. In Italy, they eat the young heads raw, with oil, salt and pepper. The stalks are eaten in France and Germany, boiled and seasoned with butter and vinegar. The flowers have the property of rennet, and have sometimes been used as a substitute for that article.

ASPARAGUS.—*Asparagus officinalis.*—*Soil.*—Asparagus ground should be light, yet rich: a sandy loam, well mixed with rotten dung, or sea-weed, is recommended.

Preparation.—A good quantity of dung trenched twelve or fifteen inches below the surface.

Propagation.—It is best to raise this plant from seeds, although the sprouts from seeds will not be fit to cut so soon by a year as from the roots. The seeds should be dead ripe, when gathered, and taken from the strongest and most compact shoots.

Quantity of seeds or roots.—If sown to transplant, for a bed four feet and a half wide by six feet in length, one quart of seed will be requisite. If sown to remain, for a bed four feet and a half wide by thirty feet in length, one pint is necessary. If plants a year old are wanted for a plantation, then for a bed four feet and a half wide by thirty feet in length, to contain four rows of plants nine inches distant in the row, one hundred and sixty plants will be requisite. The seeds may be sown as early as the season will permit in the spring, or (according to Cobbett) "three weeks, or about, before the frost sets in" in the fall—and

"press the earth well down about the seed; and, as soon as the frost sets in, but not before, cover the ground with muck or litter, a foot deep, and lay some boards or poles to prevent its blowing off. As soon as the frost breaks up in the spring, take off the litter, and you will have the plants quickly up."

Asparagus beds may be from four to four and a half feet wide, with alleys of two feet in width between them. In these beds "the soil should not be less than two feet and a half deep, and, before planting a bed, it is considered good practice to trench it over to that depth, burying plenty of dung in the bottom, as no more can be applied there for eight or ten years. It can scarcely, therefore, be too well dunged; besides, though the plant naturally grows in poor, sandy soil, it is found that the sweetness and tenderness of the shoots depend very much on the rapidity of the growth; and this is promoted by the richness of the soil. Damp ground, or a wet subsoil, is not fit for asparagus. Indeed the French consider wetness as so prejudicial to this plant, that they raise their asparagus beds about a foot above the alleys, in order to throw off the rain."—*Hort. Trans.*

Method of planting.—"Stretch a line lengthwise the bed nine inches from the edge, and with a spade cut out a small trench about six inches deep, perpendicular next to the line, turning the earth displaced along by the other side of the trench; and, having the plants ready, set a row along the trench, nine inches apart, with the crown of the roots two inches below the surface, drawing some earth, just to fix them as placed. Having planted one row, directly cover them in fully with the earth of the trench, raking it back regularly an equal depth over the crown of the plants. Proceed then to open another trench a foot from the first: plant it as above; and in the same manner plant four rows in each bed. Then, lightly raking the beds lengthwise, draw off any stones and hard clods, and dress the surface neat and even. Then let the edges be lined out in exact order, allowing three feet for each alley. But sometimes, in planting large compartments of asparagus, a first trench having been made, and the roots placed as above, then a second trench is opened, of which the earth is turned into the first over the plants. So proceed in planting the whole; making allowance between every four rows for

an alley of three feet [more or less]. In a dry spring or summer, water the roots from time to time, till the plants are established."—*Abercrombie.* It is of very great importance to take up the roots carefully, and expose them to the air as little as possible before planting.

If you would raise asparagus directly from seed, without transplanting, you may sow two or three seeds in the places designated above for setting the plants, and cover them with an inch of good soil. When the plants are up, they should be thinned to one in a place. Armstrong says, "the crowns of the roots must be placed upright, and the *pattes*, [or fingers,] as they are sometimes called, spread and directed downwards; for on their taking (to the food provided for them) the prosperity of the plantation will principally depend."

The following are the directions for the culture of this root, given in the *Catalogue of Seeds*, &c. for sale by John B. Russell, Boston; and, perhaps, are as much to the purpose as those which are more prolix, minute and circumstantial:

"Sown in April and May, in the same manner as onions, in rows, eighteen inches apart. Let it stand one or two years—transplant into trenches four feet wide, dug, if the soil will admit, fifteen inches deep—fill up six inches with rotten manure—place the roots fourteen inches apart."

In a *Treatise on Gardening*, by J. Armstrong, of Dutchess, published in *Memoirs of the New York Board of Agriculture*, vol. ii., it is said, "If we can postpone the use of the plant for a year or two, sowing is to be preferred, because the crop it gives, (other things being equal,) though later in coming, is more abundant, of better quality, and of longer duration; but, if our supply must be prompt, planting is best, for, by this mode, we, no doubt, soonest obtain the fruit."

The same writer directs to plant roots of *three* years old, instead of those of one or two years old, according to the usual practice; and says, "roots of three years will not only give fruit sooner than those of one, or two years, but, their fibres being harder, and roots more numerous, are better able to sustain the violence inseparable from transplantation, and the other accidents, (such as heating and

chafing,) which often accompany it, particularly if the roots be brought from a distance."

Extent of the plantation.—An asparagus compartment should not contain less than a pole of ground, as it often needs this quantity to furnish a good dish at one time. For a large family, about sixteen rods are kept in a productive state, which are calculated to furnish, on an average, between two hundred and three hundred shoots every day in the height of the season.—*Neill, in Ed. Encyc.*

Progressive culture.—In the month of March or April, (during the whole existence of the plant,) the beds must be carefully forked and dressed, and kept clear of weeds. Occasional waterings are necessary, till the third or fourth year, wnen the plants will be sufficiently established to do without them. Permit the entire crop the two first years, and the greater part of it the third year, to run up to stalks. It is a common practice to sow onions, lettuce, &c. the two first years. Mr. Loudon, however, says, "the advantage of this practice is questionable; and, at all events, it should not be continued after the plants are in full bearing."

Asparagus beds should be completely loosened to a moderate depth, every spring, as soon as the frost is out of the ground, with a proper fork, having three short tines, six to eight or nine inches long. But care must be taken not to go too deep, so as to wound the crowns of the roots. The beds, being loosened in every part to a moderate depth, should be raked even, before the buds begin to advance In autumn, after the tops are turned white by the frost, they should be cleared off, and a layer of dung, or rich soil, an inch thick, laid over the bed. This should be done yearly, and the bed kept clear of weeds. If the bed should get too high by this management, the surface may be taken off with a spade, early in the spring, to the depth of two inches, before the young shoots are in the way. But when this is done, a thin dressing of rotten dung or compost should be laid on. This plant, according to *Deane's N. E. Farmer*, grows well in ground that is shaded. The sprouts will be very large and tender; but they will not be so early. It is not amiss to have one bed in a shady place, to supply the table, after the season is over for cutting the first.

Time of cutting.—"If you plant roots, the shoots may be

cut the second year after; if seeds, they will not be fit to cut till the third year. All the shoots, which come up before the middle of June, may be cut off without injuring the roots; after which time, the late shoots should be left to run up, and go to seed; otherwise the roots will be weakened."—*Deane*

Cutting and gathering.—"In new plantations, be careful not to begin cutting till the stools have become mature, or the third or fourth year. Likewise observe, both in old and new beds, to gather all the produce in a regular, successive order, within the proper limits of the season. As the rising shoots project two, three, four or five inches, at most, above the ground, while the top bud remains close and plump, they are in the best condition for gathering. Cut them off within the ground, with a narrow, sharp-pointed knife, or small saw, nine inches long; thrusting the knife or saw down straight, close to each shoot separately, cut it off slantingly, about three inches below the surface, with care not to wound the young buds advancing below. Observe in a new plantation, in the first year's gathering, if the shoots come up of irregular sizes, to cut only some of the larger for a fortnight, or three or four weeks, and then permit the whole to run; but otherwise, when in strong production, gather all as they come, two or three times a week, or as required during the season, till the 21st of June; then, at furthest, terminate the cutting, and permit the after-shoots to run up in stalk till October. If, from a particular inducement, you cut later than the 21st of June, be careful to leave two or more shoots to each stool, in order to draw nourishment to it; for the stools left without growing shoots will perish; and, by negligence in this respect, many vacuities or unproductive spots are left in beds."

Duration of the plantation.—Abercrombie says, "A plantation of asparagus, under good culture, will mostly continue for ten or twelve years to afford good crops; after which the stools usually decline in fertility, and the shoots in quality; so that, to provide a permanent annual supply, some fresh beds should be planted a sufficient time beforehand, allowing four years for their advancing to a productive state."

To save asparagus seed.—"Select some of the finest and earliest heads as they make their appearance in the spring;

tie them to stakes during summer, taking care not to drive the stake through the crown of the plant. In autumn, when the berries are ripe, wash out the seeds, if for the market, or to be sent to a distance; but for home sowing, keep them in the berry till the time of sowing, the pulp being a great nourishment to the seed, which ought to be kept in a dry place during the winter."—*Hort. Trans.*

The following directions for cultivating asparagus are from the second volume of the *Memoirs of the New York Board of Agriculture*. They were furnished by Richard Treat, the oldest gardener at the Shaker village in New Lebanon, Columbia county, New York:—

"Beds should be made as soon as the ground is clear from frost—the first part of April, in ordinary seasons. The ground must be well worked to the depth of a spade blade, and intimately mixed with rotted horse-manure. The seeds should then be sowed in rows or drills, twenty inches apart, and one inch deep, the rows crosswise of the beds. They should be raked in lengthwise of the rows.

"Asparagus will be large enough to begin to cut the third spring after it is sowed. It may be cut until the 20th June every year afterwards. As soon as the cutting season is over, hoe it over lightly, so as to loosen the soil, and make the surface even. Every other year, spread on each bed an inch layer of good yard-manure before hoeing. The tops will now grow to a great size, and mostly seed well. Early in the spring, cut the dry tops close to the ground, lay them evenly on the beds, and burn them there. Then hoe the beds over, and rake them again. They are then prepared for a new growth.

"Most of the English books recommend breaking up old asparagus beds once in a certain number of years. Some of the Shakers' beds have been cut twenty-five years, and, under that course of treatment, are as good as they ever were."

Armstrong, in the treatise quoted above, says, "It has been lately asserted, and with sufficient confidence, that a pickle of salt and water, of the ordinary strength for preserving meat, may be very usefully applied to asparagus beds in the spring. The effects ascribed to it are, its stimulating power over the crop, and its tendency to destroy the seeds of weeds, and of insects lying near the surface. Experiments

on this subject should be multiplied, and with pickles differing in strength and quality." In the last edition of *Deane's New England Farmer*, it is observed, "that to a bed fifty feet by six, a bushel of salt may be applied, with good effect, before the plants start in the spring."

Use.—"The esculent part is the early shoots or buds, when three or four inches high, and partially emerged from the ground in May or June. They are in great esteem in Britain, and on the continent; and this plant has, in consequence, been cultivated for an unknown period. In Paris, it is much resorted to by the sedentary operative classes, when they are troubled with symptoms of gravel or stone."—*Loudon.*

Forcing asparagus in hot beds.—The first step in this process is to procure a supply of three year old plants, for none else are fit for the purpose. Then form a hot bed, as directed under the article HOT-BED, in the alphabetical arrangement of this work. In this set the plants, at the distance of two inches. Armstrong observes, that the mode of taking the plants from hot beds "differs from that used for plants raised in the natural way. If you employ a knife, you cannot fail to destroy many young plants, (on account of the closeness with which they stand to each other,) but the mode in which you do least mischief, is, to thrust your finger down alongside of the bud, and break it off at the root."

BALM.—*Melissa officinalis.*—"The balm is a hardy perennial, with square stems, which rise two feet high or more, furnished with large ovate leaves, growing by pairs at each joint. It is a native of Switzerland and the south of France, produces flowers of a purplish colour from June to October." There is a variety with hairy leaves.

Propagation.—"It is readily propagated by parting the roots, preserving two or three buds to each piece, or by slips, either in autumn or spring."—*Loudon.*

Culture.—"Plant the slips or sets in any bed of common earth, by dibble or trowel, and from eight inches to a foot apart, giving water, if dry weather. Those of the spring planting will soon grow freely for use the same year; and afterwards will increase by the root into large bunches of several years' continuance, furnishing annual supplies from March to September."—*Loudon.*

Dried Balm.—"Gather when coming into flower, and

when the leaves are entirely free from dew or moisture; then dry rapidly in the shade, or better in an oven; and when cool press the herbage into packages, and wrap them up in white paper till wanted for use. Keep the packages dry, and in a close drawer."—*Loudon.*

Use.—"Formerly the balm was held in very high estimation: Paracelsus supposed it to possess virtues, by which human life could be prolonged beyond the usual period. In modern times, however, the properties of this agreeable plant are better understood: it yields, by distillation, a small proportion of an essential oil, of a yellowish colour, and a very grateful smell. A few drops of this oil, diluted in a glass of simple water, or strong infusions of the young shoots, drank as tea, and continued for several weeks or months, have proved of service to nervous and hypochondriacal patients, of a lax and debilitated habit. Either of these liquid preparations, when slightly acidulated with lemon juice, acquire a fine reddish colour, and may be taken with advantage in dry, parching fevers, as well as in cases of distressing flatulency, attended with eructations, where the first passages have previously been opened."—*Dom. Ency.* vol. i. p. 127.

BARLEY.—*Hordeum.*—The following remarks on the cultivation of this grain are extracted from an article written by Jesse Buel, Esq., published in the *N. E. Farmer*, vol. v. p. 290:—

"*The soil* for barley should be such as will grow good turnips, or other green crops, including clovers, and which embrace the varieties of loams and sands that are not wet, or *very* dry and poor. Indeed, I have taken my crops, and they have been pretty good, from my lightest turnip soils. Barley cannot be cultivated to advantage upon stiff, heavy, and wet grounds, or on such as are of a cold and tenacious quality. This crop occupies the ground but about three months; and it is only in a dry, light, mellow soil, that its roots can extend with sufficient facility, and supply the food necessary to bring the grain to rapid and perfect maturity.

"*Previous crop.*—Crops that precede this grain should be such as leave the ground mellow, and free from weeds; and for this reason hoed crops are to be preferred, such as turnips, potatoes, peas, beans, &c. Small grains should not precede it: they impoverish the soil, leave it foul, and

besides, it is contravening one of the most salutary maxims of husbandry, to grow two dry crops in succession. It may follow clover; but if the soil is heavy, the ley should be ploughed in autumn. Barley is successfully sown upon the fallows in England, (not summer, but autumn fallows,) and is sown sometimes after wheat; but in the latter case turnips are pulled, and previously fed upon the stubble—a practice which I think is not likely to obtain here. I have generally sown barley after ruta baga or potatoes, these crops having received a good dressing of long, yard or stable-manure.

"*Manure* should not be applied to the barley, but to the preceding crop. The short period that this grain occupies the ground does not afford time for the manure to decompose, and yield its food to the plants; and, if applied in excess, it causes a too rank vegetation, and the straw lodges before the grain is matured. Where a fallow or clover ley is employed, and ploughed in autumn, dung may be previously applied and ploughed under.

"*Preparation of the ground.*—Where barley follows a root or hoed crop, one ploughing will generally suffice: but in all cases a complete pulverization of the soil is necessary; and to effect this a roller is often of material benefit. If sown upon grass leys, ploughed in autumn, the spring ploughing should be shallow, so as to leave the sod reversed. But the preferable way may be to harrow the fallow, plough in the seed, with a light furrow, and smooth off with the harrow.

"*The seed, and sowing.*—Loudon enumerates six species and sub-species of the barley. The kinds uniformly cultivated here are the two, four, and six rowed spring, (*hordeum vulgare*, and *h. distichon.*) Thin-skinned, pale, plump seed should be selected. I sow as soon as the ground is sufficiently dry in spring. The young grain is not hurt by the ordinary frosts of the latter part of April and May. I sow from six to eight pecks per acre, according to the richness of the soil and the forwardness of the season; the poorest ground and the latest sowing requiring the most seed. In England the common quantity of seed is from eight to sixteen pecks. Our climate being much warmer than that of Great Britain, barley and other grains till better with us, and consequently we require less seed. We uni-

formly sow broad-cast, generally on the fresh furrow, and harrow in both ways; and those who have a roller use it in the finishing operation. It gives a smooth surface, breaks down the lumps, brings the earth in contact with the seed, and if grass seeds have been sown, its use is doubly beneficial. I steep my seed twenty-four hours in a weak solution of nitre, the crude kind of which costs me only eight cents per pound by the quantity. From the analysis and observations of Grisenthwaite, there is reason to believe that this salt is peculiarly beneficial to the barley crop, the grain yielding it on analysis. I have made no comparative experiments, but I think this steep serviceable. I have applied to this grain, as a top dressing, with singular success, the powdered dung of pigeons and dunghill fowls, at the rate of twenty to thirty bushels the acre.

"The crop admits of no after-culture when sown broad-cast. Yet the application of the roller, when the plants are two or three inches high, is no doubt salutary, especially if there has been no considerable rains. Rolling gives a salutary compression to the soil, which in the spring is apt to be loose and porous, and full of cracks, by the alternation of freezing and thawing, or of wet and dry weather; it destroys many insects; and, above all, it partially buries the crowns of the plants, and induces a multiplication of seed stalks. I can recommend the practice from experience.—When grass seeds are sown with barley, the luxuriance of the young grass sometimes chokes the grain, robs it of nutriment, and sensibly diminishes the product. To obviate this evil, it has been recommended to sow the grass seeds after the barley has come up, and to cover them with a light harrow and the roller; and it is said, and I think with truth, that this operation will not materially injure the grain. In dry seasons, the crop is sometimes attacked by worms, while young. In this case the roller should be applied, and sufficient weight added, to require the draught of two or three cattle.

"*Time and method of harvesting.*—When the soil is rich, and the season propitious, this grain is very liable to lodge. If this happens after it has blossomed, no material injury is sustained in the product. If before, the crop is greatly diminished. This shows the danger to be apprehended from making the soil too rich and of applying fresh manure.

Barley is known to be ripe by the disappearance of the reddish cast on the ear, or what the English farmers term *red roan;* by the ears beginning to droop, and bend themselves round against the stems; and by the stalks becoming brittle, and of a yellowish colour. This is the particular period for cutting, as, if suffered to stand longer, the heads break off, and the grain wastes, with the slightest touch. And it may be cut with the cradle, sickle or sithe, according to circumstances. If it stands straight, and is not too heavy, the cradle is to be preferred; if heavy, or lodged, the sickle or sithe. But, as the grain is yet soft, and the straw contains much moisture, when it ought to be cut, it should be suffered to become well dried in the swath before it is bound in sheaves, or carried to the barn or stack. If cut with the cradle or sickle, it is bound in sheaves; but the more common practice is to cut the crop with the sithe, rake the ground, and load it with the barley fork.

" Barley improves for malting by lying till October before it is threshed; though it is often threshed immediately from the field. The great difficulty in preparing it for market is to rid it of the awns. This may be done with flails, after it has passed once through the fanning mill. And, where it is in great quantities, it may be spread from four to six inches upon the barn floor, and trodden with horses.

" *Produce and profits.*—The average product in England is stated by Donaldson at thirty-two bushels per acre. The product in New York varies from fifteen to seventy bushels, according to season and soil; and I think the average is somewhat short of that of Great Britain. Compared with wheat, its product is as two or two and a half to one; compared with oats, about equal, provided the soil is adapted to this grain. It is, however, to be remembered, that neither wheat nor oats are adapted to a barley soil; the first requiring a more stiff and tenacious, and the latter a more cold and moist location. The average price of barley is at least two thirds that of wheat: supposing wheat, then, to be $ 1 12 the bushel, and the product 15 bushels per acre, and barley to be 75 cents, and the product of an acre 30 bushels, and the expense of cultivation equal, the profits of the barley will be nearly as three to two compared to wheat. Barley, besides, is a less precarious crop, is subject to fewer dis-

eases, and has fewer insect enemies to encounter than wheat."

A correspondent of the Bath Agricultural Society writes—'The last spring being remarkably dry, I soaked my seed barley in the black water, taken from a reservoir, which constantly receives the draining of my dung heap and stables. As the light grains floated on the top, I skimmed them off, and let the rest stand 24 hours. On taking it from the water, I mixed the grain with a sufficient quantity of sifted wood ashes, to make it spread regularly, and sowed three fields with it. The produce was sixty bushels per acre. I sowed some other fields with the same seed dry; but the crop, like those of my neighbours, was very poor, not more than twenty bushels per acre, and much mixed with green corn and weeds when harvested. I also sowed some of my seed dry on one ridge in each of my former fields, but the produce was very poor in comparison of the other parts of the field."

BEAN.—*Vicia faba.*—There are two distinct species of the bean, which are often confounded by writers on agricultural subjects, to wit, *vicia faba*, garden bean, or horse bean, and *phaseolus vulgaris*, or kidney bean. The want of distinguishing between these two different genera or sorts of plants, may lead to erroneous practices, and consequent detriment to the cultivator.

The *vicia faba*, or garden bean, (often called *English bean*,) is an annual plant, rising from two to four feet high, with a thick, angular stem, the leaves divided, and without tendrils; the flowers white, with a black spot in the middle of the wing; seed-pods thick, long, woolly within, and enclosing the large ovate flatted seeds, for the sake of which the plant is cultivated in gardens. The following varieties are advertised for sale in Mr. Russell's Catalogue, viz.

English dwarfs,	Green nonpareil,
Early mazagan,	Broad Windsor.
Sword long pod,	

"These varieties should be planted as early as practicable in April."

It is said that this kind of bean is propagated to the best advantage in a stiff, moist loam, with a considerable proportion of clay. The following are Mr. Loudon's directions for its culture:—

Quantity of seeds.—For early crops, one pint of seed will be requisite for every eighty feet of row; for main crops, two quarts for every 240 feet of row; and for late crops, nearly the same as the early.

Method of sowing.—"Plant all the sorts in rows, two feet and a half apart, for the smaller or very early, or very late kinds; and three feet for the larger; the smaller beans two inches deep, and three inches distant in the row; the larger three inches deep, and four inches distant in the row."

Transplanting.—Speechly constantly transplants his early bean crops, and considers that this plant may be as easily transplanted as cabbage, or any other vegetable. It is a practice with him to plant beans, alternately with potatoes, in the same row; the rows three feet apart, and the potatoes eighteen inches apart in the row, so that the beans are nine inches from the potatoes. The beans are transplanted, by which means they have the start and advantage of the potatoes and weeds, and, as they come in early, may be gathered before they can possibly incommode or injure the potatoes.

Manual process.—The work of sowing is most generally effected by a dibble, having a thick, blunt end, to make a wide aperture for each bean, to admit it clear to the bottom, without any narrow, hollow parts below: strike the earth fully and regularly into the holes over the inserted beans. Or the planting may be performed, occasionally, in drills drawn with a hoe the proper depth and distance as above; place the beans at intervals along the bottom of each drill, and earth them over evenly; which method, though suitable to any kinds, may be more particularly adopted in sowing the early and other small sorts.

Soaking seed in summer.—In planting late crops in June or July, if the weather be dry, it is eligible to give the beans a previous soaking for several hours in soft water; or, if they are to be sown in drills, water the drills beforehand; then directly put in the beans, and earth them in while the ground remains moist.

Subsequent culture.—"As the plants come up, and advance from four to six inches high, hoe up some earth to the stems on both sides of each row, cutting down all weeds. Repeat the hoeing as future weeds arise, both to keep the ground about the plants clean, and to loosen the earth to

encourage their growth. In earthing up, great care must be taken that the earth does not fall on the centre of the plant, so as to bury it; for this occasions it to rot or fail. After earthing up, stir between the rows with a three-pronged fork. As the different crops come into full blossom, pinch or cut off the tops, in order to promote their fruiting sooner in a more plentiful production of well-filled pods."—*Abercrombie.*

Nichol says, "Topping is unnecessary for any but the early crops; being practised to render them more early." Mr. Armstrong is of opinion, that "of this practice, and of the theory on which it is founded, we may be permitted to doubt, because it does not appear to follow that, when the growth of a plant is checked or suspended in one direction, it will not exert itself in another as injuriously to the crop as any increased length of stem would have done. Every day's experience shows, that, if we pollard an apple-tree, we indeed stop its growth upward; but that, instead of sending its surplus juices to the support and enlargement of the fruit, (as this practice supposes,) it hastens to throw out lateral stems or suckers, which give no fruit whatever. Our creed, therefore, is, that, in the vegetable economy, certain juices go to the production of the stem, and certain others, more elaborated, and of a different quality, to that of flowers and fruits, and that, whether desirable or not, the art of giving to either a destination different from what nature intended, is yet to be discovered."

Gathering.—For table use, gather only such as are tender, the seeds decreasing in delicacy after they obtain about half the size which they should possess at maturity. When they become black-eyed, they are tough and strong tasted, and much inferior.

To save seed.—"Either plant some of the approved sorts early in the spring, wholly for that purpose, or leave rows of the different crops ungathered, in preference to the gleanings of gathered crops. The pods will ripen in August, becoming brown and dry, and the beans dry and hard: then, pulling up the stalks, place them in the sun to harden the seed thoroughly, after which thresh out each sort separately."—*Abercrombie.*

Use.—Mr. Cobbett says, "In England there are some sorts of this bean used for horses and hogs; but there are

several sorts used as human food. It is at best a coarse and not very wholesome vegetable, yet some people like it. It is very much eaten by the country people, in England, with their bacon, along with which it is boiled." Bean flour, as Dr. Darwin observed, is probably more nutritive than that of oats, which appears by its effect in fattening hogs; and, from the relative prices of these articles, he was of opinion, that peas and beans, in general, supply a cheaper provender for horses and other animals. But as the flour of beans and peas is more oily than that of oats, it must be more difficult of digestion. Hence, when a horse has been fed with pulse, he will be less active for an hour or two afterwards, than if he had eaten oats. It will, therefore, be advisable to mix pollard or straw, finely cut, with peas and beans, before they are given to cattle.

BEAN, KIDNEY.—*Phaseolus vulgaris.*—This plant and its uses are too well known to require any description. The sorts mentioned in Russell's Catalogue, are *Kidney dwarfs, or string :*—early yellow cranberry; early Mohawk, (which will bear a smart frost without injury;) early yellow six weeks; early Canadian dwarf; early dwarf cluster; early dun coloured, or Quaker; early China dwarf; large white kidney dwarf; white cranberry dwarf; red cranberry dwarf; Warrington, or marrow; refugee, or thousand to one; Rob Roy; white cutlass bean of Carolina. *Pole or running beans :*—large white Lima; saba or Carolina; scarlet runners; white Dutch runners; Dutch case-knife, or princess; red cranberry; white cranberry; (the three last mentioned string beans;) asparagus, or yard long, *dolichos sesquipedalis.*

The following directions for the culture of the bean in gardens are from McMahon: "Towards the latter end of April, [or the fore part of May in New England,] you may plant a first crop of kidney-beans in the open ground. Select a warm, dry, and favourably situated spot, and, having dug and manured it properly, draw drills an inch deep, and two feet or thirty inches asunder; drop the beans therein, two inches apart, and draw the earth equally over them; do not cover them more than an inch deep; for at this early time they are liable to rot, if cold or wet ensue. The kinds proper to be sown now are, the early cream-coloured, speckled, yellow and white dwarfs."

Loudon gives the following directions for the culture of

runners, or *pole-beans*, as they are commonly called in this country:—The runner kidney beans may be sown in a small portion towards the end of April, [about the middle of May in New England,] if tolerably warm, dry weather; but as these beans are rather more tender than the dwarf sorts, more liable to rot in the ground by wet and cold, especially the scarlets, the beginning or middle of May [first of June in New England] will be time enough to sow a considerable crop; and you may sow a full crop about the beginning of June. Allot principally the scarlet and large white runners. Some Dutch runners are very eligible as a secondary crop. The first crops should have the assistance of a south wall. Intermediate crops may be sown in any open compartment, or against any fence not looking north. The latest sown will continue bearing longer under a good aspect and shelter. In sowing, draw drills about an inch and a half, or not more than two inches deep. Let parallel rows be at least four feet asunder, to admit in the intervals tall sticks or poles for the plants to climb on. Place the beans in the drills four inches apart, and earth them in evenly the depth of the drills. A row contiguous to a fence or building may ascend upon lines. Some may be sown in a single row along a border, or on each side of a walk, and have the support of a slight trellis of laths and lines; or they might be arched over with similar materials to form a shady walk or bower. In a cold, wet season, or when requisite to have a few plants more forward than the general crop, some scarlets may be sown in April, either in a slight hot-bed, or in pots, under frames of hand-glasses, to raise and forward the plants, till two or three inches high: then, at the end of May, transplant them into the open garden. As the plants come up, and advance from three to six inches in growth, hoe some earth to the stems, cutting down all weeds. When they begin to send forth runners, place suitable supports to each row; and conduct the tendrils to the sticks or lines, turning them in a contrary direction to the sun. The ascending plants will soon come into flower, podding at the joints, in long succession. They are so prolific, that the returns from three sowings, in May, June and July, will last from July till October.

Taking the crop.—Gather the pods, both from dwarfs and runners, while they are young, fleshy, brittle and tender,

for then they are in the highest perfection for the table; and the plants will bear more fully, and last longer in fruit, under a course of clean gathering, not leaving any superabundant pods to grow old.

To save seed.—Either sow a portion for that object, or leave rows wholly ungathered, of the main crop, or preserve a sufficiency of good pods promiscuously. The beans saved should be the first fruits of a crop, sown at a period which throws the entire course of growth into the finest part of summer. Let them hang on the stalks till they ripen fully, in August and September; then let the haulm be pulled up and placed in the sun, to dry and harden the seed, which should be afterwards cleared out of the husks, bagged up, and housed.

The pea, English bean, and kidney bean, are liable to the attacks of various insects, especially the *aphides*, [plant lice,] in dry seasons. When early crops are newly sown, or planted, mice will burrow for and eat the seed, and when it begins to penetrate the soil, it is attacked by snails, slugs, the cut worm, &c. The usual means of guarding against the ravages of insects must, therefore, be resorted to by the gardener.

As regards the field culture of the bean, we would observe, that the white kind, which is most generally approved of in New England, will produce pretty good crops, on poor, sandy, or gravelly soils; but, when planted on such ground, it is good husbandry to wet and roll them in plaster before planting. They may be planted in hills, or drills, the rows two and a half or three feet apart, according to the strength of the soil, and cultivated like other hoed crops. They may be planted the latter end of May, or beginning of June, or about the time of planting Indian corn. If planted in hills, they may be placed from fourteen to twenty-four inches apart in the rows, and the rows the distance before mentioned. Five beans are quite enough to remain in a hill. Hogs' dung, mixed with ashes, is said to be the best manure for them; and it is said to be very injurious to beans to hoe them while the dew is on, or in wet weather.

Judge Buel, of Albany, has given the following notices of some experiments, in the field culture of this vegetable: —"Beans may be cultivated in drills or in hills. They are

a valuable crop, and, with good care, are as profitable as a wheat crop. They leave the soil in good tilth. The China bean, with a red eye, is to be preferred. They ripen early, and are very productive. I cultivated beans the last year in three different ways, viz. in hills, in drills, and sowed broad-cast. I need not describe the first, which is a well known process. I had an acre in drills, which was the best crop I ever saw. My management was this:—On an acre of light ground, where the clover had been frozen out the preceding winter, I spread eight loads of long manure, and immediately ploughed and harrowed the ground. Drills or furrows were then made with a light plough, at the distance of two and a half feet, and the beans thrown along the furrows about the 25th of May, by the hand, at the rate of at least a bushel on the acre. I then gauged a double mould-board plough, which was passed once between the rows, and was followed by a light one horse roller, which flattened the ridges. The crop was twice cleaned of weeds, by the hoe, but not earthed. The product was more than forty-eight bushels, by actual measurement. The beans brought me one dollar the bushel last fall. The third experiment was likewise upon a piece of ground where the clover had been killed. It was ploughed about the first of June, the seed sown like peas, upon the first furrow, and harrowed in. The drought kept them back; but about 65 rods of ground, on which the experiment was made, gave a product of twelve and a half bushels. The crop was too ripe when it was harvested, and as it was cut with a sithe, I estimated that about two and a half bushels were left upon the ground. No labour was bestowed upon them from the time they were sown till they were harvested."

Forwarding an early crop.—The kidney bean is often partially forced, in hot-houses or frames, with a view to the forwarding of its produce in the open garden. Mr. Armstrong says, "In the neighbourhood of cities, the dwarf varieties are often cultivated in hot-beds, but the product is of a very inferior kind; for, of the whole catalogue of vegetables, none is more apt to take a disagreeable flavour from hot and fermenting dung (which is the basis of these beds) than the bean." It is probable, however, that beans might be forced to advantage, in hot-beds, composed of oak

leaves, tanner's bark, &c. without deriving therefrom the disagreeable flavour complained of.

BEET.—*Beta.*—Among the more common varieties of this valuable vegetable are,

French sugar, or amber beet,	Early blood turnip-rooted,
Mangel wurtzel,	Early dwarf blood,
Green—for stews or soups,	Early white scarcity,
Yellow turnip-rooted,	Long blood red.

Sown from April to June. The early turnip blood beet is the earliest, and of excellent quality for summer use; the tops being good for boiling as greens. Mr. Loudon's directions for the general culture of the beet are as follow: —

"*Seed and soil.*—The beet is always raised from seed, and for a bed four feet and a half by twelve feet, one ounce is requisite. The soil in which it naturally delights is a deep, rich sand, dry and light, rather than moist. Sowing in seed beds, and transplanting, has been tried; but, though it may answer for the spinage or pot-herb beets, [white, and its varieties,] it will not answer where the object is a large, clean root.

"*Sowing.*—The beet is sown annually the last week of March, or beginning of April, [in the northern United States, the main crop should be delayed till the middle of May.] The ground on which it is sown should have been previously enriched by mellow compost and sea sand; but rank dung is not to be laid in, as it is apt to induce canker. For the long-rooted kind, trench to the depth of eighteen inches. Sow either broad-cast on the rough surface, and rake well into the earth; or, as the seed is large, sow in drills an inch or two deep and a foot asunder; or dot it in with a thick, blunt-ended dibble in rows that distance, making holes ten or twelve inches apart, about an inch and a half deep; drop two or three seeds in each hole, but with the intention to leave only one beet plant."

Mr. Mahon says, "Make choice of a piece of rich, deep ground, lay it out into four feet wide beds, push the loose earth into the alleys, then sow the seed tolerably thin, and cover it with the earth out of these alleys to about three quarters of an inch deep. Or, let drills be drawn with a hoe, near an inch deep, and a foot or a little better asunder; drop the seeds thinly therein, and cover them over the same

epth as above. Or you may sow the seed on a piece of ground, rough, after being dug, and rake it well in."

Subsequent culture.—When the young plants are advanced into leaves, one, two, or three inches in growth, they must be thinned and cleared from weeds, especially those sown promiscuously, or broad-cast and in drills. If there be chasms in the rows, fill them up with the superfluous plants. The oftener the ground is stirred, during the whole course of the vegetation of the plant, the larger will be the product, and the better its quality.

As soon as vegetation is over, which always occurs after the first hard frost, take up the plants, expose them a day or two to the air, to evaporate their surplus moisture, and then house them carefully. This may be done by putting them in layers in a dry cellar, and interposing between these a slight covering of sand. In digging the roots, great care should be taken that they be not broken nor cut, as they bleed much. For the same reason, the leaves should be cut off at least an inch above the solid part of the root.

To save seed.—Either leave a few strong roots standing in the rows, or select a few, and transplant them to a spot where there will be no danger, when in flower, of being impregnated with any other variety. They will shoot up the second year, when their flower-stocks should be tied to stakes, to prevent their breaking over.

Field culture of the mangel wurtzel beet, and the sugar beet.—*Soil and preparation.*—The soil for these roots should be a loam, inclining to clay, in good tilth, well manured, and made fine to a good depth. John Hare Powel, Esq., corresponding secretary to the Pennsylvania Agricultural Society, in giving an account of his mode of cultivating this crop, says, "My soil was not naturally strong: it has been gradually so much deepened as to enable Wood's plough, No. 2, drawn by four oxen, to plough fourteen inches deep Fresh barn-yard manure was equally spread upon the surface, and ploughed under in the early part of April, in quantities not larger than are generally used for potato crops in this country. Early in May, the land was twice stirred with Beatson's scarifier, harrowed, rolled; after stirred, harrowed and rolled again in the opposite direction." The soil on which Messrs. Tristram Little and Henry Little of Newbury, Mass. raised their premium crop in 1824, is a clay

loam. In 1823, about three fourths of the same was sowed with onions, and manured with about 8 cords of compost manure to the acre. The other quarter was sowed with wheat without manure. In the fall of 1823, there were about 10 cords of compost manure drawn on the lot, and put in a heap. Most of the said compost was drawn from the salt marshes, when ditching the same; the other part was from the barn-yard. In the month of April, 1824, the heap was thrown over, and well mixed.

Planting.—Col. Powel says, "The holes for the seeds were made by a wheel, containing pegs in its circumference, which penetrated the ground about an inch, leaving intervals of four inches; the rows were made 2 feet asunder; two capsules were dropped into each hole; the wheel of a common barrow was passed over them, thus compressing the earth, and leaving a slight rut for the retention of moisture."

Messrs. Tristram and Henry Little observe, that, "Between the 8th and 11th of May, the land was ploughed and sowed in the following manner:—After one deep ploughing, the ground was furrowed two and a half feet apart, and the manure put into the furrows, and covered with a double mould-board plough; a roller was then passed on the top of the ridge, and the seed dibbled in with the finger over the manure, about six or eight inches apart." The quantity of seed, according to English writers, is four pounds to an acre. Mr. David Little, in obtaining a premium crop, sowed four pounds, but observed that he thought half that quantity would have been sufficient.

After-culture.—In raising Col. Powel's crop, "A small cultivator, which I had contrived for the purpose, was drawn between the rows soon after the weeds appeared; a three inch triangular hoe removed the alternate plants, leaving the others at distances varying from 8 to 12 inches asunder. The cultivator was twice used before the 20th of July. The heavy rains of August made another hoeing necessary, and surcharged the ground so much with moisture, that all roots increased much less in that month than during the same time in the two last years." The Messrs. Little, "in the course of the season, thinned their plants, and left them from 6 to 12 inches apart in the rows. They were once hoed, and ploughed three times between the

rows." Mr. Powel, in raising a previous crop, had placed the rows 30 inches apart, and left the plants 6 inches apart in the rows. He says, "I this year desired smaller roots, which might grow so closely, as, by their leaves, to protect the soil as much as possible from the rays of the sun. My cultivator, by its peculiar form, enabled me to cut off the weeds when the plants were so young, that, if I had applied the plough, their crowns must have been covered in many instances, by earth occasionally falling from its land side. The failure which attends the cultivation of most root crops in drills, proceeds from the neglect of weeds in their early stages. Four or five days of delay frequently make the difference of fifteen days in the labour of making clean an acre of ground. The same weeds which a boy with a sharp shingle could remove at the commencement of one week, may, before the end of the next, require the application of an implement drawn by a horse.

"I ascribe my success, in great measure, to the use of *Wood's extraordinary plough*, which enters the soil more deeply, and pulverizes it more perfectly, than any other I have ever seen, with equal force, in any country; to the use of cultivators, which complete the production of fine tilth; to the destruction of the weeds on their first appearance—leaving the smallest space upon which a horse can walk between the rows; and, above all, to *planting the seeds of a proper kind upon a surface which is kept perfectly flat.*"

General remarks.—Agriculturists have not agreed whether it is most expedient to plant the seeds of this root on ridges or on a level. Col. Powel condemns planting on ridges in this country, as a practice not adapted to our soil and climate, in which vegetables are very liable to suffer by drought. He says, "Among the various practices, into which we have been seduced by the plausible theories of the advocates of European husbandry, there is none which appears to me more absurd than that which has led us to drill or dibble our crops on ridges. The English farmer wisely contends with the evils produced by too much rain; the American husbandman should as anxiously guard against his most formidable enemy, drought. I am inclined to think that there is no crop cultivated in this state, (Pennsylvania,) which ought not to be put on a flat surface." The climate of New England, especially its northern part, is not so warm

and dry as that of Pennsylvania, and, in that part of the United States, perhaps the nature of the soil should decide the question, if dry, level planting, or if moist, ridge planting should be adopted."

We have heard complaints from American farmers, that the seed of this root is slow and uncertain in coming up. Perhaps the seed or soil, or both, may sometimes be too dry at the time of sowing. A writer in the *English Farmer's Journal* says, "I have of late years steeped my seed for at least forty-eight hours. I made an experiment with twenty sound seeds not steeped, twenty steeped twenty-four hours, and the same number steeped forty-eight hours; every seed of the latter produced plants, which came up two or three days sooner than either of the others, and some of those not steeped did not come up at all." Mr. Cobbett, in treating of the culture of the common garden beets, (*American Gardener*, par. 198,) directs to soak the seed four days and nights in rain water before it is sowed; and observes, that the mangel wurtzel should be cultivated in the same manner as the other kinds of beets. American writers, so far as we have observed, give no directions for soaking the seeds of this vegetable before planting; and it is possible that the omission of this part of the process may cause the slowness and uncertainty of vegetation complained of. The capsule, or husk, which contains the seeds, is dry, and it requires a long time for the moisture, which it may derive from the earth, to penetrate this integument, so as to cause the seed to sprout. But if the soil be very moist at the time of sowing, soaking the seed had better be omitted.

Much has been written and said on the subject of stripping these plants of their leaves for feeding cows and other economical purposes. An English writer observes, that six or seven crops of leaves and stocks may be taken off during the growth of the root; women and children can take off the leaves, which is done as follows:—They should place their hands on each side of the root, at the foot stalks of the leaves, leaving about six of the smallest central leaves between the fore-finger and thumb of each hand, (the small leaves are to be left on the root to grow, to make a fresh top;) then, spreading the hand flat with their face downwards, push them both at the same time towards the ground,

and thus, by one motion, will the whole of the top of each root, except the small leaves to be left to form a fresh head, be removed without unsettling the root or its fibres, which would check its growth. Some affirm, that stripping the plant of its leaves is no injury to the root, and others are of opinion that the root is injured by this means. We have doubts, whether, in field cultivation, it will often be deemed expedient to expend time and labour in this manner. The thinnings, or superfluous plants, however, should be preserved, as they make excellent food for milch cows or store swine.

Some cultivators affirm, that it is never worth the trouble to transplant these roots to fill vacancies. "I have seen," says an English writer, "much labour and expense employed in transplanting into vacant spots, when the seed has been dibbled thick enough, but have never seen the transplanted roots worth half the trouble; the tap root being broken in the drawing, nothing but the top, and useless rough roots and fangs are produced. It has been remarked by other writers, that the most common cause of failure in transplanting this root is the taking of them up when too small, before the plants have obtained strength and size sufficient to bear the operation of transplanting.

Use.—The following remarks are from a paper communicated to the trustees of the Massachusetts Agricultural Society, by J. Lowell, Esq. president of said society. They are derived, principally, from a French publication, by the Abbé Rosier:—

"This root is very little affected by changes of weather. It is attacked by no insect; drought affects but little its vegetation. It prepares the land extremely well for other crops. It may be sown and treated precisely like the common beet, except that it ought to stand eighteen inches asunder.

"In good land, they often weigh nine or ten pounds, and are stripped eight or nine times. In a light, sandy, but well manured soil, they sometimes weigh fourteen and even sixteen pounds each!

"The first crop of leaves in France is taken off in the latter end of June, or the beginning of July. In this country, probably, the latter period would be preferable. The lower leaves, those which incline towards the ground, are

those which are taken away, and care must be taken to preserve the top leaves, or the crown of the plants. The leaves may be taken off every fifteen days after the first gathering. Oxen, cows and sheep devour them greedily, and fatten readily upon them. All domestic poultry eat them readily, when chopped fine and mixed with grain. Horses will feed upon them very well, mixed with chopped straw. Hogs also fatten upon them.

"Cows fed upon this root, solely, give a greater quantity of milk and cream, and of better quality for the first fifteen days, after which they grow too fat, and the milk lessens. The food of cows must therefore be varied. Oxen and sheep fatten very well upon them. Cows should have grass in proportion of one third to the beet leaves, or every third day they should be turned to grass. In this mode their milk will be excellent. The trouble of gathering the leaves is less than that of gathering any other green fodder. It may be done by children, while men are required to cut other green food for cattle. It is the surest crop, since the plant will stand the largest droughts. The roots are gathered and treated like those of the common beet. The skin is very tender, and care should be taken to handle them so as they may not be wounded, as they will, in that case, not keep so well. In order to preserve the seed in purity, care must be taken to change the ground in which the seed-beets are planted. The seed can be preserved, after it is gathered, three or four years, without injury. In giving these roots to cattle for food, they are first washed, and then cut up into pieces about the size of a nut. It is always best to accompany them, when given to horned cattle, with clover, or other hay or straw, and if the hay or straw has been previously cut fine, it will be preferable. If horses are fed with this root, with a proportion of hay or cut straw, (half of each,) they will be fat, vigorous and healthy. If they are worked severely, a little oats or corn may be added. It is thus they are treated in Germany, where this root stands in the stead of meadows or grass lands, and whose excellent horses are well known.

"Hogs, fed upon them raw, after they have been cut up fine and mixed with milk or other drink, fatten as well upon them as upon boiled potatoes, by which the fuel and trouble of boiling is saved.

"As to the quantity given to animals, much will depend on the proportion of other fodder, which you allow them. Cows fed twice a day in winter upon eighteen pounds of these roots at each time, together with four pounds of hay or chopped straw, will give as much and as good milk as in summer, and they will be kept in the best possible state."

"Oxen fed with forty weight of these roots per day, with ten pounds of hay, for one month, and after that with fifty weight per day of the roots alone, will be fat enough for sale in two months more.

"Any person disposed may, from the facts above stated, calculate how many cattle will be supported by a single acre of land on which this plant is cultivated.

"Men can eat this vegetable throughout the year; it is agreeable and healthy. No insect attacks it, and it suffers but little from the variety of the seasons. The leaves of this plant form alone an excellent food for every species of domestic quadruped, during four months in the year. Turnips and other vegetables are, besides, liable to be destroyed by insects, whereas this beet is not. The roots can be preserved eight months in a sound state, while turnips are of little value after March. In some soils turnips will not grow, particularly in those which are very stiff or strong. The root of scarcity grows every where. The milk of cows fed on turnips has a bad taste. That of those fed on this plant is excellent, as is also the butter made from it. This forage on green fodder comes also at the hot seasons, when almost all other green food is scarce, and sometimes not to be procured. Cattle never get tired of it.. In many parts of Germany, where it is raised with success, they prefer it to every thing else to fatten those large herds of cattle which they annually export to France. In feeding cattle with beets, the same dry food must be given which is usually given with turnips."

Col. Powel observes, "My neat cattle prefer mangel wurtzel to any roots which I have offered to them. I have found its effects in producing large secretions of *good* milk very great. I selected, in November, two heifers of the same breed, and very nearly of the same age, and in similar condition; they were fed in adjoining stalls, and have been fed, regularly, three times a day, by the same man. One of them has had three pecks of mangel wurtzel

and four quarts of corn meal, daily; the other, four and a half pecks of mangel wurtzel. The last, which has had mangel wurtzel alone, is in the condition of good beef; the other is not more than what graziers call half fat.

"The application of mangel wurtzel as food for sheep is not the least important of its uses. Ewes yean usually at the season when grass cannot be supplied. The health of themselves, and the thrift of their lambs, essentially depend upon succulent food being had. I am inclined to think, that no small portion of the success which English breeders have met, is to be ascribed to the large stores of roots, which they always have at command. It cannot be denied, that Indian meal will, of itself, in most cases, produce extraordinary fatness, as well as great size; but I have been led to believe, that diseases are early engendered by this species of forcing, which is always expensive, and, too often, eventually destroys the animal which has been thus reared."

A writer in the *Farmer's Journal* says, "This root is now generally allowed to stand eminent for the excellence of its fattening qualities. Among our field productions, parsnips and carrots may justly be declared more nutritious, Swedish turnips, as holding divided empire with it; while white turnips and cabbages sink into insignificance before it. The taste, both of the leaf and root, is most grateful to every description of stock: bullocks, sheep and hogs instinctively lay hold of them, and, when once accustomed to their flavour, they reject every other sort of green food, if they have the election.

"No edible root has yet been brought into use, which has an affinity to the one under consideration, with respect to its imperishable properties. The white turnip is in March entirely divested of its fattening power; the Swede in May becomes shrivelled, and is almost refused by cattle; the potato, after this time, entirely sprouts away all its vigour, diminishes in bulk, and dries up; but not so the mangel wurtzel. It is not only ready for use in the autumn, the winter, and spring, but may, if required, be continued with unabated advantage, and, in the following autumn, it will be found in full possession of its most valuable qualities, undiminished in weight, and abounding in saccharine juices." It has, however, been thought by cultivators in this country, that the ruta baga is more easily

preserved, and will remain useful to a later period in the spring and summer after its growth, than the mangel wurtzel.

Messrs. T. and H. Little observe, as to the value of the roots for feeding stock, "there is a variety of opinions; but, from a number of years' experience, we think them a valuable addition, and highly worth cultivating. Comparing them with English hay,—and we know of no better standard—in our opinion, three tons of mangel wurtzel, or potatoes,—of the two, we value the mangel wurtzel the highest,—are equal to one ton of hay, for feeding stock generally; but for milch cows, we think two tons of equal value; for feeding store swine, mangel wurtzel is the only root, that we know of, which we can cultivate and feed to profit. Six bushels of raw mangel wurtzel we think equal to one bushel of Indian corn."

Quantity to an acre.—The premium crop of the Messrs. Little was 33 tons 10 cwt. and 14 lbs. on an acre. Col. Powel enclosed certificates to the president of the Penn. Agr. Society, showing that sixteen hundred and thirty-four bushels of mangel wurtzel, weighing seventy-eight thousand four hundred and forty-eight pounds, were produced upon one acre and fourteen perches; and a part of the same field, containing thirteen contiguous rows, produced at the rate of two thousand and sixty-five bushels per acre, weighing 44 tons, 5 cwt. and 27 lbs. In Great Britain, it is said that upwards of sixty tons have been raised on an acre.

Gathering and preserving.—In gathering the roots, care should be taken to cut off the leaves about half an inch above the crown, as they will not keep so well, if cut more closely. Messrs. Tristram and Henry Little say, "As to the best mode of preserving them, we have tried divers ways,—by pitting them, by putting them into a barn, and covering them with hay, and by putting them into the cellar; the last mode we think the best." Col. Powel observes, that one of his crops was "piled in a cellar, in rows, as wood, and covered with sand." A writer in the *English Farmer's Journal* observes, that he has practised, with success, the following mode of preserving this root:—"I pack it in long heaps, about seven feet wide at the bottom. I begin by forming the outsides with the roots, not stripped

of their tops; tops outwards; the internal parts to be filled with roots without leaves; continue one layer over another, until the heap is about six feet high, and about two feet broad at top, which may be covered with straw and earth; the ends of the heap should be covered in the same way; the leaves form an efficient covering against rain and frost."

Mr. M'Mahon's mode of preserving beets, and other roots, is as follows:—"Previous to the commencement of severe frost, you should take up, with as little injury as possible, the roots of your turnips, carrots, parsnips, beets, salsify, scorzonera, Hamburg or large-rooted parsley, skirrets, Jerusalem artichokes, turnip-rooted celery, and a sufficiency of horse-radish, for the winter consumption; cut off their tops, and expose the roots for a few hours, till sufficiently dry. On the surface of a very dry spot of ground, in a well sheltered situation, lay a stratum of sand two inches thick, and on this a layer of roots of either sort, covering them with another layer of sand, (the drier the better,) and so continue layer about of sand and roots till all are laid in, giving the whole, on every side, a roof-like slope; then cover this heap or ridge all over with about two inches of sand, over which lay a good coat of drawn straw, up and down, as if thatching a house, in order to carry off wet, and prevent its entering the roots; then dig a wide trench round the heap, and cover the straw with the earth so dug up, to a depth sufficient to preserve the roots effectually from frost. An opening may be made on the south side of this heap, and completely covered with bundles of straw, so as to have access to the roots at all times, when wanted either for sale or use.

"Some people lay straw, or hay, between the layers of roots, and immediately on the top of them; this I do not approve of, as the straw or hay will become damp and mouldy, and very often occasion the roots to rot, while the sand would preserve them sweet and sound.

"All these roots may be preserved in like manner in a cellar; but in such a place they are subject to vegetate and become stringy earlier in spring. The only advantage of this method is, that in the cellar they may be had when wanted, more conveniently during winter, than out of the field or garden heaps.

"*Note.* All the above roots will preserve better in sand

than in common earth; but when the former cannot be had, the sandiest earth you can procure must be dispensed with."

BENE PLANT.—*Sesamum.*—This was introduced into the Southern States by the negroes from Africa. It abounds in many parts of Africa. Sonnini and Brown, travellers in Egypt, say it is much cultivated there for the purpose of feeding horses, and for culinary purposes. The negroes in Georgia boil a handful of the seeds with their allowance of Indian corn. Probably no plant yields a larger proportion of oil, which Dr. Cooper of Philadelphia has pronounced equal to the finest oils. But it is worthy of cultivation in the Northern States, principally, as a medicinal plant. A gentleman in Virginia has given Messrs. Thorburn & Son the following account of its virtues:—"It requires to be sown early in April, at a distance of about one foot apart. A few leaves of the plant, when green, plunged a few times in a tumbler of water, make it like a thin jelly, without taste or colour, which children afflicted with the summer complaint will drink freely, and is said to be the best remedy ever discovered. It has been supposed, that (under Providence) the lives of three hundred children were saved by it last summer in Baltimore, and I know the efficacy of it by experience in my own family." This plant will throw out a greater profusion of leaves by breaking off the top when it is about half grown.—*Russell's Catalogue.*

BORECOLE.—*Brassica oleracea.*—The borecole contains several sub-varieties, the common characteristic of all which is an open head, sometimes large, of curled or wrinkled leaves, and a peculiar, hardy constitution. There are fourteen varieties enumerated by Loudon. Those which he says are the most valuable, are the green borecole, Scotch kale, or Siberian borecole, the purple or brown kale, the German kale, German greens, or curlies.

Propagation.—All the sorts are propagated by seed; and for a seed bed four feet by ten, Abercrombie says, one ounce of seed is necessary. M'Mahon directs to "sow towards the end of March [about three weeks later in New England] a first crop of borecole for autumn service," and observes—

"There are two principal sorts, the green and the brown, both very hardy plants, with tall stems, and full heads

of thick fimbriate, curled leaves, not cabbaging, and are desirable open greens for winter, &c. Let this seed be sown in an open exposure, distant from trees, and from close fences, as, in such situations, they are apt to draw up too fast, with long, weak stalks; sow it broad-cast, and rake it in." Several crops may be sown in several successive months, from the middle of April to the middle of September. In dry weather, water the plants occasionally, both before and after they are up. "When about three inches high, it will be proper to thin the seed bed, and prick out a quantity therefrom, at four inches distance, that the whole may obtain proper strength for final transplanting.

"When the plants are set in the places, where they are to complete their growth, they should be planted out like cabbages, at three feet distance every way, and afterwards be kept free from weeds, and the earth drawn to their stems as they advance in growth. Those intended for winter use should not be planted in a rich, fat loam, as there they would become too succulent, and consequently could not bear the frost as well as if growing on a gravelly soil. Such as are designed for autumn use, may be planted in any convenient bed that is tolerably rich.

"The green and brown curled borecole, being very hardy, will require little protection [against the cold of winter]. In November they may be taken up, and planted in a ridge tolerably close together, and, during severe frost, be covered lightly with straw; this will preserve them sufficiently: and during winter the heads may be taken off as they are wanted for use; the stems, if taken up and planted in rows, as early in March as the weather will admit, will produce abundance of the most delicious sprouts.

"In the Southern States, and even in warm soils and exposures in the Middle States, borecole will stand the winter in open beds, without any covering whatever."—*M'Mahon.*

Use.—The crown or centre of the plant is cut off, so as to include the leaves which do not exceed nine inches in length. It boils well, and is most tender, sweet and delicate, provided it has been duly exposed to frost.—*Loudon.*

BORER.—*Saperda bivitata.*—An insect that injures apple-trees, &c.—*See* INSECTS.

BROCCOLI.—*Brassica oleracea.*—There are several varieties of broccoli, which are all merely late-heading va-

rieties of the cauliflower. Miller mentions the white and purple broccoli, as imported into England from Italy; and it is thought that from these two sorts all the subsequent kinds have arisen, either by accidental or premeditated impregnations. The kinds introduced into this country are, the early white, early purple, and large cape.

The seeds of broccoli should be sown in New England about the latter end of May, or beginning of June; and when the young plants have germinated eight leaves, they should be transplanted into beds. By this management, towards the latter end of July, they will be fit to be planted out in some well sheltered piece of ground, at the distance of a foot and a half in the rows, and two feet between each row.

The soil proper for broccoli is rather light than heavy. M'Mahon says, the early purple broccoli, if sown early in April, and planted out as you do cabbage, in good rich ground, will produce fine heads in October or November, very little inferior to cauliflowers, and, by many, preferred to them: the white will not flower so early, and, in the Middle and Eastern States, must be taken up in November, and managed as directed in that month, [see "*preserving cabbages*," &c. under the article CABBAGE, in the following pages,] by which a supply of this very delicious vegetable may be had, in great perfection, during all the winter and spring.

"In such of the Southern States, as their winters are not more severe than in England, they will stand in the open ground, and continue to produce their fine flowers, from October to April. In the Middle, and especially the Eastern States, if the seeds are sown early in March on a hot-bed, and forwarded as is done with cauliflowers and early cabbage plants, and planted out finally in April, it would be the most certain method of obtaining large and early flowers."

Insects and diseases.—"In old gardens, infested, as is often the case, with an insect which in summer insinuates itself into the roots of all the *brassica* tribe, and causes the disease called the *club*, trenching the ground deep enough to bring up four or six inches of undisturbed loam or earth, will probably bury the insects too deep for mischief, and provide fresh ground for the benefit of the plants. In gar-

dens much exhausted by reiterated croppings, if this mode cannot be adopted, a good quantity of fresh loam from a common field, dug in, would materially improve the broccoli, and be of lasting use in future crops. Broccoli, in general, succeeds best in a fresh, loamy soil, where it comes, I think, more true in kind, and is hardier without dung; but if this situation cannot be had, deep digging, with plenty of manure, is the only remaining alternative to produce good crops. I believe soap ashes, dug into the ground in considerable quantities, to be a good preservative from the club; and if the roots of the plants, just previously to planting, are dipped and stirred well about in mud of soap ashes with water, its adherence will, in a great measure, preserve them from attack; perhaps a mixture of stronger ingredients, such as soot, sulphur, tobacco, &c. would be still better."—*Hort. Trans.* vol. iii.—*See* CABBAGE.

Wood, a writer in the *Caledonian Horticultural Memoirs*, says, he has paid a considerable degree of attention to the culture of broccoli, and has made considerable progress therein. He found that manuring with a compound of sea-weed and horse-dung produced the largest and finest heads he had seen for many years.

Culture without transplanting.—"M'Leod grows cape broccoli, in a very superior manner, without transplanting. In the end of May, after having prepared the ground, he treads it firm, and, by the assistance of a line, sows his seed in rows two feet apart, dropping three or four seeds into holes two feet distant from each other in the row. When the seeds vegetate, he destroys all except the strongest, which are protected from the fly by sprinkling a little soot over the ground; as the plants advance, they are frequently flat hoed until they bear their flowers; they are once earthed up, during their growth. A specimen of broccoli, thus grown, was exhibited to the Horticultural Society; the head was compact and handsome, measuring two feet and nine inches in circumference, and weighing, when divested of its leaves and stalks, three pounds; the largest of its leaves was upwards of two feet long. M'Leod adopts the same mode in the cultivation of spring-sown cauliflowers, lettuces, and almost all other vegetables, avoiding transplanting as much as possible."—*Hort. Trans.* vol iv p. 559.

To save seed.—Wood, already mentioned, selects the largest, best formed, and finest heads, taking particular care that no foliage appears on the surface of the heads: these he marks, and, in April, lays them by the heels in a compound of cleanings of old ditches, tree leaves, and dung. When the head begins to open or expand, he cuts out the centre, leaving only four or five of the outside shoots to come to seed. Lifting, [taking up,] he says, prevents them from producing proud seed, as it is called, or degenerating.—*Caled. Hort. Mem.* vol. ii. p. 267. Abercrombie says, broccoli seeds degenerate in this country, [England,] and that the best seed is obtained from Italy. —*Loudon.* The common directions are, in substance, as follow:

Reserve a few of the largest heads of the first crop, stripping constantly off all under shoots, leaving only the main stem to flower and seed, and tie them to strong stakes, to prevent their being broken by winds and heavy rain. Care should be taken, that no other sort of cabbage is suffered to go to seed near them.

Use.—The same as the CAULIFLOWER, which see in its alphabetical order.

BRUSSELS SPROUTS.—*Brassica oleracea.*—The Brussels sprouts produce an elongated stem, often four feet high, from which sprout out shoots, which form small green heads, like cabbages in miniature, each being from one to two inches in diameter, and the whole ranged spirally along the stem, the main leaves of which drop off early. The top of the plant resembles that of a Savoy, planted late in the season; it is small, and with a green heart of little value. Van Mons says, (*Hort. Trans.* vol. iii.) "If this vegetable be compared with any other, which occupies as little space, lasts as long, and grows as well in situations generally considered unfavourable, such as between rows of potatoes, scarlet runners, or among young trees, it must be esteemed superior in utility to most others." Nicol considered it deserving a more general culture in Scotland.

Use.—The sprouts are used as winter greens; and at Brussels they are sometimes served at table, with a sauce composed of vinegar, butter and nutmeg, poured upon them hot, after they have been boiled. The top, Van Mons

says, is very delicate when dressed, and quite different in flavour from the sprouts.

Culture.—The plants are raised from seed, of which an ounce may be requisite for a seed bed, four feet by ten feet. Van Mons, in the paper already referred to, says, "The seed is sown in the spring, under a frame, so as to bring the plants forward; they are then transplanted into an open border with a good aspect." By thus beginning early and sowing successively till late in the season, he says, "we contrive to supply ourselves in Belgium with this delicious vegetable full ten months in the year; that is, from the end of July to the end of May." The plants need not be placed at more than eighteen inches each way, as the head does not spread wide, and the side leaves drop off. In this, as in every other respect, the culture is the same as that of the borecole.

Gathering the crop.—Morgan says, the sprouts must have some frost before gathered; but this Van Mons assures us is an erroneous opinion. In Belgium, the small cabbages are not esteemed if more than half an inch in diameter. It is usual to cut off the top about ten or fifteen days before gathering from the stem. In spring, when the sprouts are disposed to run to flower, their growth is checked by taking up the plants, and setting them in the ground in any shaded spot.

To save seed.—Van Mons says, it is usual to save seeds indiscriminately from plants which have and those which have not been topped; but that he intends to save from the tops only, hoping thereby to improve the progeny. Whatever mode be adopted, the grand object is to place the plants where they will be in no danger of receiving the farina of any other of the *brassica* tribes.—*Loudon.*

BUCKTHORN.—*Rhamnus.*—There are many plants of this genus; but we shall take notice of but one species, principally on account of its use in forming hedges. The kind used for that purpose is the *rhamnus catharticus*, or purging buckthorn. It is common in a wild state in England and other parts of Europe, as well as in the United States. Gen. E. H. Derby, of Salem, Mass. has cultivated this plant, and is, we believe, the first person who applied it to the very important use of forming hedges; for which purpose it is said to be much preferable either to the haw-

thorn or crab, principally on account of its being entirely free from the *borer*, (an insect which frequently destroys the hawthorn,) as well as all other annoyances of a similar nature. A letter from Mr. Derby to the editor of the *N. E. Farmer*, published in that paper, vol. iii. p. 214, contains the following notices of this shrub :—

"You will perceive that Miller represents it as a shrub growing about 12 or 14 feet high. The tree from which my plants were raised, formerly stood in the garden of the venerable Dr. Holyoke of this place, who used the berries for medicinal purposes, and was as large as any of our common apple-trees. He assures me he was induced at last to cut it down, as it shaded so much of his garden. I was so pleased with the healthy and clean appearance of the tree, and the next spring observing several young plants in the adjoining garden belonging to my brother, raised from seed dropped in the autumn, that I was induced to transplant them to a nursery, where they grew with great rapidity.

"After trying several kinds of trees, for the purpose of making a hedge, without much success, I was induced to try this, which has afforded a most beautiful fence, so much so as to attract the attention of every person who has seen it. It divides my garden, is about three hundred feet in length, the plants set nearly a foot apart, is five feet high, and two feet wide at top, which is cut nearly level. It shoots early in the spring, makes a handsome appearance, and continues its verdure till very late in the fall. It has not so much spine as either the English or American hawthorn, but I think sufficient to protect it from cattle. The plant bears the knife or shears remarkably, and makes as close and tight a fence as either of the others, and is not subject to blight, as both of them have been with me. You will observe that Miller speaks of it as not so proper for hedges as the hawthorn or crab, which may be the case in England, but I cannot agree with him as it respects America.

"The tree furnishes a large quantity of seed, which rapidly vegetates; and I make no doubt it can be propagated by cuttings, which mode I shall adopt in the spring."

Propagation and culture.—"The purging buckthorn shrub is so common in the hedges of many parts of England, that it is seldom cultivated in gardens. It rises easily from

seeds, if they are sown in autumn soon after the berries are ripe; but if they be left out of the ground till spring, the plants will not come up till the year after. These will require no particular treatment, but may be managed in the same way as young crabs, or any other hardy, deciduous tree or shrub. It may also be propagated by cuttings or layers. If the young shoots be layed in autumn, they will put out roots by the following autumn, when they may be taken off, and either planted in a nursery, to get strength for a year or two, or where they are desired to remain."—*Miller.*

Uses.—There are other uses to which this shrub may be applied besides that of forming hedges. Goats, sheep, and horses eat the leaves, but cows refuse them. The wood is said to be valuable for the turner. "From the juice of the unripe berries, with alum, a yellow, and from the ripe ones a fine green is obtained; the bark also strikes a yellow and brown red colour. The juice of the unripe berries is of the colour of saffron, and is used in staining maps or paper; that of the ripe berries is the sap green of miniature painters, and is much esteemed; but if they are gathered late in autumn, the juice is purple."—*Dom. Ency.*

A syrup prepared from buckthorn berries has been used in medicine, but is not often prescribed, as it occasions much sickness and griping. In a Latin treatise, published by Dr. J. G. Kolb, of Erlang, in Germany, the bark of the buckthorn is much recommended as a mild, cheap, and efficacious remedy, in every respect preferable to the berries.

Budding.—*See* INOCULATION, in the alphabetical order.

CABBAGE TRIBE. The cabbage tribe is of all the classes of cultivated culinary vegetables the most ancient, as well as the most extensive. The *brassica oleracea*, being extremely liable to sport or run into varieties and monstrosities, has, in the course of time, become the parent of a numerous race of culinary productions, so very various in their habit and appearance, that to many it may appear not a little extravagant to refer them to the same origin. Besides the different sorts of white and red cabbage and Savoys, which form the leaves into a head, there are various sorts of *borecoles*, which grow with their leaves loose in the natural way, and there are several kinds of cauliflower and broccoli, which form their stalks or flower-buds into a head.

All of these, with the turnip-rooted cabbage and the Brussels sprouts, claim a common origin from the single species of *brassica* above mentioned. Cabbage of some sort, White, in his History of Selborne, informs us, must have been known to the Saxons; for they named the month of February *Sprout kale*. Being a favourite with the Romans, it is probable that the Italian cabbage would be introduced at an early period into South Britain. To the inhabitants of the north of Scotland, cabbages were first made known by the soldiers of the enterprising Cromwell, when quartered at Inverness.—*Edin. Ency.* art. HORTICULTURE.

CABBAGE.—*Brassica oleracea capitata.*—Among the varieties of the cabbage, which have been introduced into this country, the following are enumerated in Mr. Russell's Catalogue :

Early Salisbury dwarf,	Late sugarloaf,
Early York,	Large green glazed,
Early Dutch,	Tree, or thousand-headed,
Early sugarloaf,	Large Scotch, *for cattle*,
Early London Battersea,	Green globe Savoy,
Large Bergen, or great American,	Red Dutch, *for pickling*,
Early emperor,	Large cape Savoy,
Early Wellington,	Yellow Savoy, [ground)
Russian,	Turnip-rooted, or Arabian, (above
Large late drumhead,	Turnip-rooted, (below ground)
Late imperial,	Chou de Milan.

Soil and situation.—Every variety of cabbage grows best in a strong, rich, substantial soil, inclining rather to clay than sand; but will grow in any soil, if it be well worked, and abundantly manured with well rotted dung. But, according to Loudon, "The soil for seedlings should be light, and, excepting for early sowings, not rich. Where market gardeners raise great quantities of seedling cabbages to stand the winter, and to be sold for transplanting in the spring, they choose, in general, the poorest and stiffest land they have got, more especially in Scotland, where large autumnal sowings, of winter drumhead and round Scotch, are annually made, and where the stiffness of the soil gives a peculiar firmness of texture and hardiness of constitution to the plants, and prevents their being thrown out of the soil during the thaws which succeed a frosty winter. Transplanted cabbages require a rich mould, rather clayey than sandy; and, as Neill and Nicol observe, it can scarcely

be too much manured, as they are an exhausting crop. Autumnal plantations, intended to stand the winter, should have a dry soil, well dug and manured, and of a favourable aspect. The cabbage, whether in the seed-bed or final plantation, ever requires an open situation. Under the drip of trees, or in the shade, seedlings are drawn up weak, and grown crops are meager, worm-eaten and ill-favoured.

Sowing cabbage seed.—M Mahon says, "The proper period for sowing cabbage in the Middle States, to produce *early* summer cabbages, is between the sixth and the tenth of September, if intended to be transplanted into frames in October, for winter protection, which is the preferable method; but if they are designed for remaining in the seed-beds till spring, the period is between the fifteenth and twentieth. However, it will be very proper to make two or three sowings within that time, as it is impossible to say whether the fall may be favourable or otherwise, and, therefore, the better way is to be prepared in either case by successive crops.

"The consequence of having crops too early is, that they are subject to run to seed in the spring soon after being planted out; and if the seeds are sown too late, the plants do not acquire sufficient strength before winter to withstand its rigour, without extraordinary care. But in either case there is a remedy; that is, if the plants are likely to become too luxuriant and strong, transplant them once or twice in October, and if too backward and weakly, make a slight hot-bed towards the latter end of that month, and prick them out of the seed-bed thereon; this will forward them considerably."

Mr. M'Mahon thinks that, in the Eastern States, the fore part of September will be a suitable time to sow cabbages intended to be grown the succeeding summer. The seeds should be covered about a quarter of an inch deep, and, if the weather prove dry, should be watered occasionally in the evening till they come up. According to Abercrombie's seed estimate, "for a seed-bed to raise the early York and similar varieties, four feet wide by twenty in length," two ounces will be required; for a seed-bed to raise the large sugarloaf, and other luxuriant growers, four feet by thirty-six in length, two ounces. The same writer directs to "sow at three different seasons, that is, spring,

summer and autumn, and cover from an eighth to a quarter of an inch. Under a deficiency of winter standing young plants for final transplanting in spring, or in order to have some spring sown plants as forward as possible, a moderate portion of some best early sorts may be sown between the middle of February and the middle of March, in a slight hot-bed or frame, to nurture the plants till the leaves are an inch or two in length. Then prick them into intermediate beds in the open garden, there to gain strength for final transplanting."

Planting in New England.—"Some drop the seeds where the cabbages are to grow. By this they escape being stinted by transplanting; for winter cabbages, the latter part of May is early enough to put the seed into the ground, whether the plants are to be removed or not. I have tried both ways, and, on the whole, I prefer transplanting. They are otherwise apt to be too tall, and to have crooked stems. Covering plants with leaves is not a good practice. They will be much heated through some sorts of leaves, the free circulation of air about them will be prevented, and their perspiration partly obstructed. If a hot sun cause them to droop, a shingle, stuck into the ground, will be sufficient shelter, if it be on the south side of the plants. I commonly allow each plant two shingles, one on the south-east side, and one on the south-west, meeting at the south corner."—*Deane.*

The act of planting should be performed carefully. Holes, of sufficient depth and width, should be dibbled, for the smaller sorts of cabbages, at the distance of two feet and a half, and, for the larger sort, of three feet every way. In these the earth should be placed up to the lower leaves, and the earth brought closely about the roots, which is best done by pushing down the dibbler, at a small angle with the plant, and then bringing it up to it with a jerk. This leaves no chambering, (as gardeners call it,) no vacancy between the plant and the soil.

"The state of the weather, when these operations are performed, is not a matter of indifference, and has been a subject of controversy; some recommending dry weather, others wet. As in many other cases of disputation, the truth lies between them—that is, moist weather is neither dry nor wet, and is precisely that which is best for setting

out cabbages, or any other vegetable. We ought not, however, to wait long for even this most favourable state of the atmosphere, since, with a little labour, we have the means of making up for its absence."—*Armstrong.*

"Dig the plants up, that is, loosen the ground under them with a spade, to prevent their being stripped too much of their roots. The setting stick should be the upper part of a spade or shovel handle. The eye of the spade is the handle of the stick. From the bottom of the eye, to the point of the stick, should be about nine inches in length. The stick should not be *tapering*, but nearly of equal thickness all the way down to within an inch and a half of the point, where it must be tapered off to the point. If the wood be cut away, all round, to the thickness of a dollar, and *iron* put round in its stead, it makes a very complete tool. The iron becomes bright, and the earth does not adhere to it as it does to wood. Having the plant in one hand, and the stick in the other, make a hole suitable to the root that it is to receive. Put in the root in such a way, that the earth, when pressed in, will be on a level with the but-ends of the lower or outward leaves of the plant. Let the plant be rather higher than lower than this; for care must be taken not to put the plant so low as for the earth to fall, or be washed into the heart of the plant, nor even into the inside of the bottom leaves. The stem of a cabbage, and the stems of all the cabbage kind, send out roots from all the parts of them that are put beneath the surface of the ground. It is good, therefore, to plant as deep as you can without injury to the leaves. The next consideration is, the *fastening of the plant in the ground.* The hole is made deeper than the length of the root, but the root should not be bent, at the point, if it can be avoided. Then, while one hand holds the plant, with its root in the hole, the other hand applies the setting stick to the earth on one side of the hole, the stick being held in such a way as to form a sharp triangle with the plant. Then, pushing the stick down, so that its point go a *little deeper than the point of the root*, and giving it a little *twist*, it presses the earth against the point, or bottom of the root. And thus all is safe, and the plant is sure to grow."—*Cobbett.*

After-culture.—Little more is necessary than to stir the ground pretty frequently, and keep it clear of weeds. It

is recommended to hoe the ground while the dew is on, once a week, till they begin to head.

Diseases and insects.—Cabbages are liable to a disease in the roots, in which they become swelled and knobby, and the plants of weak and imperfect growth. This disorder is called *stump foot*, *fumble foot*, &c. It has been supposed to be caused by the attacks of grubs, below the surface of the ground; and the disorder is said to be chiefly prevalent where the same sorts of cabbages have been raised on the same ground several years in succession. Lovet Peters, Esq. of Westborough, Mass., says, the cause of the stump foot, is in the soil:—"Few pieces of land, I believe, that have been, for several successive years under the plough, will produce a good crop of cabbages, though there may be exceptions. My method of raising them, which I have practised several years with complete success, is the following:—In the spring, take a piece of green sward, of a good soil, and free from stones, and turn it over with the plough as flat as possible; then spread on a large quantity of good manure: if it has been previously mixed with leached ashes, the better. Then harrow greatly, and early in June: if for winter cabbage, cut holes through the turf, with a hoe, as near together as the cabbages ought to grow; fill the holes with fine earth and manure, and then set the plants, or put in a small number of seeds: I prefer the latter, however,* since it saves the labour of setting, and

* Cultivators do not agree on the subject of transplanting cabbage plants, or sowing the seeds in the spots where the plants are to grow. Dr. Deane, as has appeared above, after having tried both methods, gave the preference to transplanting. Mr. Peters, we have seen, prefers the other mode. Mr. Bordley relates an experiment, in which he "compared cabbages transplanted with others *not once moved*. The *unmoved* grew, and were better than the *moved*." Mr. Cobbett says, "to have *fine* cabbages of any sort, they must be *twice* transplanted. First, they should be taken from the seed-bed, (where they have been sown in beds near to each other,) and put into fresh dug, well-broken ground, at six inches apart, every way. This is called *pricking out*. By standing here about fifteen or twenty days, they get straight, and stand strong, erect, and have a straight and stout stem. Out of this plantation they come *all of a size*; the roots of all are in the same state, and they strike quicker into the ground where they stand for a crop." According to *Rees' Cyclopedia*, it was the practice of the celebrated Bakewell, and other cultivators who followed his example, to drill cabbage seed where the plants were to remain. Perhaps there would be no necessity for transplanting cabbages, in order to make the stems "straight and stout," according to Mr. Cobbett's directions, if the plants were not originally sown too thick, or were properly thinned at an early period of their growth. An English writer says, "Much injury frequently arises to young cabbage plants, from the seed being

is much surer of success, if it happens to be a time of drought. They will need no more hoeing than is necessary to keep down the weeds. In this way, I have raised cabbages of the largest size, in a green sward potato field, without more hoeing than was necessary for the potatoes."

Cabbage plants are liable to be attacked, by a grub or black worm, in the night, which eats off the stalks, just above ground, and buries itself in the ground as soon as the sun rises. Dr. Deane observed, that a little circle of lime or rock-weed round the plant, will preserve it, and recommends digging for the worm near the place which shows the marks of its ravages, and destroying it. Scalding the hills with boiling water, and then enclosing them with boards, barks, or shingles, would be an effectual, but troublesome mode, of guarding against worms. The *Economical Journal of France* gives the following method, which, it states, is infallible, to guard not only against caterpillars, but all other insects which infest cabbages or other vegetables:—Sow with hemp all the borders of the ground where the cabbage is planted; and, although the neighbourhood be infested with caterpillars, the place enclosed with hemp will be perfectly free, and not one of the vermin will approach it. Watering the plants with water which had been poured boiling hot on elder leaves, or walnut leaves, and suffered to stand till cool, has been recommended. The following mixture is also said to be a preservative against all kinds of insects:—Take a pound and three quarters of soap, the same quantity of flowers of sulphur, two pounds of puff balls, and fifteen gallons of water. When the whole has been well mixed, by the aid of a gentle heat, sprinkle the insects with the liquor, and it will instantly kill them. To get rid of the *aphides* or cabbage lice, watering the plants with soap-suds, or a solution of salt in water, (not too strong, lest it kill the plants,) is said to be efficient.

Use.—The culinary uses of the cabbage are too well known to need description or recapitulation. If they grow near a yard where cattle are kept, the under leaves, when they begin to decay, may be stripped off and given them.

sown too thick; care should, therefore, be taken, to have them properly thinned out, whenever they come up in too thick a manner. Probably, if the plants were sown in the hills in which they are intended to grow for a crop, and thinned out in due season, they would grow as straight and stout, as if they had been several times transplanted."

The plants will not be injured, and they are an excellent food for cattle, and will much increase the milk of cows. But the least decayed alone should be given to cows, lest they give the milk a bad taste. Much account is made of cabbages, in England, for feeding cattle in the winter; but the difficulty of preserving them renders them less valuable for that purpose with us. Cabbages are also eaten by swine and horses, and are thought to be excellent food for ewes that have newly dropped their lambs, and for calves.

Preserving cabbages.—Mr. M'Mahon recommends the following method for preserving cabbages for winter and spring use :—"Immediately previous to the setting in of hard frost, take up your cabbages and Savoys, observing to do it in a dry day; turn their tops downward, and let them remain so for a few hours, to drain off any water that may be lodged between their leaves; then make choice of a ridge of dry earth, in a well-sheltered, warm exposure, and plant them down to their heads therein, close to one another, having previously taken off some of their loose, hanging leaves. Immediately erect over them a low, temporary shed, of any kind that will keep them perfectly free from wet, which is to be open at both ends, to admit a current of air in mild, dry weather. These ends are to be closed with straw when the weather is very severe. In this situation, your cabbages will keep in a high state of preservation till spring; for, being kept perfectly free from wet, as well as from the action of the sun, the frost will have little or no effect upon them. In such a place the heads may be cut off as wanted, and if frozen, soak them in spring, well, or pump water, for a few hours previous to their being cooked, which will dissolve the frost, and extract any disagreeable taste occasioned thereby."

The principal gardener in the Shaker establishment, in New Lebanon, Columbia county, N. Y. directs not to pull up cabbages in autumn, "till there is danger of their freezing too fast in the ground to be got up. If there happens an early snow, it will not injure them. When they are removed from the garden, they should be set out again in a trench dug in the bottom of a cellar. If the cellar is pretty cool, it will be the better."

The *London Monthly Magazine* gives the following method, by which cabbages may be preserved on board ships,

&c.—"The cabbage is cut so as to leave about two inches or more of the stem attached to it; after which the pith is scooped out to about the depth of an inch, care being taken not to wound or bruise the rind by this operation. The cabbages then are suspended by means of a cord, tied round that portion of the stem next the cabbage, and fastened at regular intervals to a rope across the deck. That portion of the stem from which the pith is taken, being uppermost, is regularly filled with water."

To save cabbage seed.—"The raising of the seed of the different sorts of cabbage, Neill observes, affords employment to many persons in various parts of England. It is well known that no plants are more liable to be spoiled by cross breeds, than the cabbage tribe, unless the plants of any particular variety, when in flower, be kept at a very considerable distance from any other; also in flower, bees are extremely apt to carry the pollen of the one to the other, and produce confusion in the progeny. Market gardeners, and many private individuals, raise seed for their own use. Some of the handsomest cabbages of the different sorts are dug up in autumn, and sunk in the ground to the head; early next summer a flower-stem appears, which is followed by abundance of seed. A few of the soundest and healthiest cabbage-stalks, furnished with sprouts, answer the same end. When the seed has been well ripened and dried, it will keep for six or eight years. It is mentioned by Bastien, that the seed-growers of Aubervilliers have learned by experience, that seed gathered from the middle flower-stem produces plants, which will be fit for use a fortnight earlier than those from the seed of the lateral flower stem; this may deserve the attention of the watchful gardener, and assist him in regulating his successive crops of the same kind of cabbage."—*Loudon.*

Field culture.—The variety cultivated in the fields for cattle is almost exclusively the large Scotch, or field cabbage. The land is prepared the same way as for other hoed crops. "The preparation given to the plants," says Loudon, "consists in pinching off the extremity of their tap-root, and any tubercles which appear on the root or stem, and in immersing the root and stem in a puddle or mixture of earth and water, to protect the fibres and pores of the roots and stem from drought. The plants may then be inserted by

the dibber, taking care not to plant too deep, and to press the earth firmly to the lower extremity of the root. If this last point is not attended to, the plants will either die, or, if kept alive by the moisture of the soil, or rain, their progress will be very slow. When the distance between the ridglets [or rows] is twenty-seven inches, the plants are set about two feet asunder in the rows, and the quantity required for an acre is about 6000 plants." The after-culture, preservation, uses, &c., have been sufficiently detailed in the preceding pages, under this head.

CANKER-WORM.—*See* INSECTS.

CARAWAY.—*Carum carui.*—"The caraway is a biennial plant, a native of England, being occasionally found in meadows and pastures. It rises a foot and a half high, with spreading branches; the leaves are decompound; the leaflets in sixes; it produces umbels of white flowers in June.

"*Use.*—The plant is cultivated chiefly for the seed, which is used in confectionary and in medicine. In spring, the under leaves are sometimes put in soups; and in former times the fusiform roots were eaten as parsnips, to which Parkinson gives them the preference. In Essex, large quantities of the seed are annually raised for distillation with spirituous liquors.

"*Culture.*—It is raised from seed, of which a quarter of an ounce is sufficient for a seed-bed four feet by five. Sow annually, in autumn, soon after the seed is ripe: the seedlings will rise quickly, and should be thinned to a foot's distance each way. In default of sowing in autumn, sow in March or April, either in drills or broad-cast; but the plants, so raised, will not in general flower till the following year. When the seed is ripe, the plant is generally pulled up in gathering, especially in field culture."—*Loudon.*

CARDOON.—*Cynara cardunculus.*—The cardoon is a hardy, perennial plant, a native of Candia, introduced into England in 1658. It is a species of artichoke, and grows wild in the south of France.

Propagation.—"Though a perennial, it often dies in the winter, and therefore requires to be raised from seed almost every year; and, for a bed four feet wide by eight feet, two ounces are sufficient. Formerly the plants were raised on hot-beds, and transplanted in May and June, but now the seed is generally sown where the plants are to remain."—*Loudon*

Use.—"The parts of the cardoon that are eaten are not those belonging immediately to the flower, as of the artichoke, but the roots, stalks, and middle ribs of the leaves and chiefly the latter, which are thick and crisp. But as all these are naturally bitter, the plants are blanched by being tied up like lettuces, about the month of September, and having earth thrown upon their lower parts to the depth of eighteen inches or two feet. Cardoons come into season about the end of November; and are either eaten alone, or as a sauce to animal food, particularly roast meat; or are introduced as a dish in the second course."—*Loudon.*

CARROT.—*Daucus.*—This plant is said to be a native of Great Britain, where it is still found growing wild. There are many varieties of the carrot; and the following are the finest sorts enumerated in Mr. Russell's Catalogue:

Altringham, (a superior sort,)	Lemon,
Early horn,	Long orange,
Cremer, (fine for the table,)	Blood red.

Soil.—"The carrot requires a light, mellow soil, mixed with sand, and should be dug or trenched one or two spades deep, breaking well all the lumpy parts, so as to form a porous bed, and an even surface. The orange and red sorts, on account of their longer roots, require a soil proportionably deeper than the horn."

Seed estimate and sowing.—The seeds have numerous forked hairs on their borders, by which they adhere together, and therefore should, previously to sowing, be rubbed between the hands, and mixed with dry sand, in order to separate them as much as possible. They are also very light, and therefore a calm day must be chosen for sowing; and the seeds should be disseminated equally, and trodden in before raking. Previously to sowing, if convenient, the seed should be proven, by sowing a few in a pot, and placing it in a hot-bed or hot-house, as it is more frequently bad than most seeds. For a bed 4½ feet by 30, one ounce will be requisite, and the same for 150 feet of drill row. Dr. Deane advises to sow carrots in drills from 9 to 12 inches apart, across beds 4 feet wide. M'Mahon directs to sow thin in drills, distant from each other from 8 to 10 inches, and to thin them to 3 inches, plant from plant, in the rows.

To save seed.—Plant some largest, best roots early in the spring, two feet apart; insert them a few inches over the

crowns. They will yield ripe seed in autumn, of which gather only from the principal umbel, which is likely not only to afford the ripest and largest seed, but the most vigorous plants.

Field culture.—"The only sort of carrot adapted to field culture," says Loudon, "is the long red, or field carrot. New seed is most essential, as it will not vegetate the second year. The best soil for the carrot is a deep, rich, sandy loam; such a soil ought to be at least a foot deep, and all equally good from top to bottom. On any other the field culture of the carrot will not answer.

"The usual preparation of the seed for sowing is the mixing it with earth or sand, to cause it to separate more freely; but Burrows adds water, turns over the mixture of seeds and moist earth several times, and thus brings it to the point of vegetating before he sows it. Having weighed the quantity of seed to be sown, and collected sand or fine mould, in the proportion of about two bushels to an acre, I mix the seed with the sand or mould, eight or ten pounds to every two bushels, and this is done about a fortnight or three weeks before the time I intend sowing; taking care to have the heaps turned over every day, sprinkling the outside of them with water each time of turning over, that every part of the sand heaps may be equally moist, and that vegetation may take place alike throughout. I have great advantage in preparing the seed so long before hand; it is by this means in a state of forward vegetation, therefore lies but a short time in the ground, and, by quickly appearing above ground, is more able to contend with those numerous tribes of weeds in the soil, whose seeds are of quicker vegetation."

The quantity of seed, when carrots are sown in rows, is two pounds per acre; and, for broad-cast sowing, five pounds. The rows for the larger or proper field carrots, should be from 14 to 16 or 18 inches apart; and the carrots thinned, in hoeing, to 3 or 4 inches apart in the rows. The seeds will do best when sown by hand, as their shape does not well admit of their being sown by machines. Loudon says, "It has been advised, by an intelligent cultivator, to deposit the seed to the depth of one inch in the rows, leaving the spaces of fourteen inches between them as intervals; the seed, in these cases, being previously steeped in rain

water for twenty-four hours, and left to sprout, after which it is mixed with saw-dust and dry mould, in the proportion of one peck and a half of each to a pound of seed. The land is afterwards lightly harrowed over once in a place. Two pounds of seed, in this mode, is found, as has been observed, sufficient for an acre of land."

After-culture.—The first hoeing of carrots must be by hand—an operation which requires a great deal of attention, as it is difficult to distinguish and separate the weeds from the young carrots. Loudon says, "From eight to fifteen or eighteen inches, each way, is the common distance at which they are allowed to stand; and it has been proved, from many years' experience in districts where they are most cultivated, that carrots which grow at such distances always prove a more abundant crop than when the plants are allowed to stand closer together." Deane observed, "It is not amiss if they grow large and rank, when they are chiefly designed as food for cattle, though small-sized ones are preferred for the table."

Mr. Quincy gives the following statement of the mode of cultivating carrots, made use of by Samuel Wyllys Pomeroy, Esq., and which he prefers to all others:—

"Plough as deep in the fall or spring as the state of the land will permit. Cross-plough in the spring, and harrow level. Put on fifteen, twenty, or twenty-five buck-loads of the most rotten compost to the acre, as the heart of the land may be. Spread and harrow it fine. Then, with a horse-plough, strike it into two-bout ridges, as near together as four back furrows will make them, and if the two first back furrows are narrow, the other two being deep, the ridge will be nearly to a point, and should be eighteen or twenty inches from the bottom of the furrow, if it be well cleared out. To do which, make another bout in the furrow, if necessary. Then, with the head of a rake, strike off the crown of the ridge, till it is three or four inches wide, and with it, or a hoe, open a drill in the usual manner. Sow the seed pretty thick, cover and press down a little with a hoe or shovel. When the weeds appear, run a small plough through the furrows. Hand-weed the crop, and hoe the weeds from the sides of the ridge. The orange carrot is best."

"In harvesting, a plough with one yoke of oxen should

be run near the side of the range of carrots, and as deep as possible. This loosens the dirt, and clears one side of the carrots almost entirely from the earth. The labourers then, with great facility, take them by their tops out of the beds, and throw them into carts, with only an occasional use of the hoe to plants which the plough has not loosened.

"I have no question that, conducted in this mode, a carrot crop may be made more productive, and much less expensive, than the potato crop usually is. In sowing, I use a small hand-drill, which lays the seed with great regularity—a circumstance very important both to facilitate weeding and harvesting; since, if the carrots stand straggling, and not in a line, the plough, when harvesting, leaves the more to be loosened by the hoe or the fork."—*Massachusetts Agricultural Repository*, vol. iv. p. 24.

A mode of cultivating carrots, differing slightly from the above, is described by Mr. Quincy, in the same work, vol. iv. p. 212.

For other modes of cultivating this root, see *Mass. Agr Rep.* vol. v. pp. 20, 255, 347.

Use.—"Horses are remarkably fond of carrots, and it is even said, that, when oats and carrots are given together, the horses leave the oats, and eat the carrots. The ordinary allowance is about forty or fifty pounds a day to each horse. Carrots, when mixed with chaff, that is, cut straw, and a little hay, without corn, keep horses in excellent condition for performing all kinds of ordinary labour.

"In comparing the carrot with the potato, an additional circumstance greatly in favour of the former is, that it does not require to be steamed or boiled, and it is not more difficult to wash than the potato. These and other circumstances considered, it appears to be the most valuable of all roots for working horses.

"The use of the carrot in domestic economy is well known. Their produce of nutritive matter, as ascertained by Sir H. Davy, is ninety-eight parts in one thousand; of which three are starch, and ninety-five sugar. They are used in the dairy in winter and spring to give colour and flavour to butter. In the distillery, owing to the great proportion of sugar in their composition, they yield more spirit than the potato; the usual quantity is twelve gallons per

ton. They are excellent in soups, stews, and haricots, and boiled whole with salt beef.

"The diseases of carrots are only such as are common to most plants, such as mildew, insects, &c. The mildew and worms at the root frequently injure crops, and are to be guarded against, as far as practicable, by a proper choice, soil, season of sowing, and after-culture."—*Loudon.*

CATERPILLAR—an insect on fruit trees.—*See* INSECTS.

CAULIFLOWER.—*Brassica oleracea. var. botrytis.*—The cauliflower is one of the most delicate and curious of the whole of the *brassica* tribe; the flower buds forming a close, firm cluster or head, white and delicate, for the sake of which the plant is cultivated.

Varieties.—Early, (*for the first, early crops.*)—Later, or large, (*for principal crops.*)

"*Propagation and soil.*—The cauliflower is raised from seed, of which half an ounce is sufficient for a seed-bed four feet and a half wide, by ten in length. The soil for the seed-bed may be light, but, for final transplanting, it can hardly be too rich, the cauliflower, like the vine, being reputed a 'rough feeder.' Cleanings of streets, sesspools, &c., ought, therefore, to be liberally supplied during the growth of the plants, when very large heads are desired.

"*Times of sowing.*—The early and main superior crop, brought to fruit by the longest nursery attendance; the late summer succession crop, raised by the shortest course; and the Michaelmas (29th of Sept.) crop, obtained at the least expense, are sown, respectively, at three different seasons. The principal sowing is made about the end of the third week in August, or a day or two before or after the 21st, to raise plants to stand over winter, under frames, hand-glasses, or half-sheltered warm borders, for the early and main superior crops next summer. A secondary sowing in February or March, for succession, and late inferior crops the same year in summer and autumn. A final sowing, near the close of May, for ordinary crops, to yield fruit the following autumn and winter. The seedlings, protected with glass frames, generally grow too gross in the stems, which become partly blackened, and the plants, being thus unhealthy, are not fit for planting out. Late-raised seedlings, which spend the winter in the open border, uniformly become the large and

finest table cauliflowers during the summer, though they certainly do not come in quite so early. Cauliflower plants, it is probable, are often killed with too much attention. Seedlings, raised late in autumn, seem to be very tenacious of life."—*Caled. Hort. Mem.* iii. 192. "A method of producing cauliflowers, pretty early, and with great certainty, is this:—The plants are set in small pots in the winter season, and kept in any convenient part of the floor of a vinery or other glazed house. In the beginning of March, they are taken out of the pots with the ball of earth attached, and planted in the open ground. If they be here protected against severe frosts with bell-glass covers, they come into head in the course of April, if the weather prove favourable."—*Neill, in Edin. Encyc.*

Drummond, of the Cork botanic garden, protects cauliflower plants during winter by planting them in excavations made in the common soil of the garden, and covered with frames thatched with long, straight wheat straw. He uncovers constantly, in mild weather, whether nights or days.—*Hort. Trans.* v. 369.

For after-culture, preservation through winter, saving seed, &c. proceed as with the common white cabbage.

Use.—"Among the succulent plants produced in our climate, this doubtless is one of the most nourishing, and likewise the best adapted to tender organs of digestion, especially in valetudinarians and invalids: such persons, however, ought to eat it with the addition of some aromatic spice, such as pounded cardamoma, or caraway, or a small proportion of bread. To make the cauliflower blanch handsomely, the gardeners tie over the heads of the plant.

"*To prepare cauliflowers.*—Let the cauliflowers first be parboiled; next they must be immersed in cold, hard water, for some time, till they be nearly wanted for the table; thus, on being boiled for a few minutes, they will become more firm and crisp than if cooked in the usual manner."—*Dom. Encyc.*

Neill (in *Edinburgh Encyc.*) observes, "These heads or flowers being boiled, generally wrapped in a clean linen cloth, are served up as a most delicate vegetable dish. Cauliflower is a particular favourite in this country. 'Of all the flowers in the garden,' Dr. Johnson used to say, 'I like the cauliflower.' For the early supply of the London market, very great quantities of cauliflower are fostered under hand-glasses during winter and the first part

of spring; and to behold some acres overspread with such glasses, gives the stranger a forcible idea of the riches and luxury of the metropolis."

CELERY.—*Apium graveolens.*—Celery is a hardy biennial plant, a native of Great Britain, and, when in its wild state, it is denominated *smallage*. The root, in its wild state, is thick and fibrous. The stalk is bushy and furrowed, and attains the height of two or three feet. The leaves are wedge-shaped, and the flowers yellow, which are produced in August. The varieties usually cultivated are, the

White solid,	Italian, and
Rose-coloured solid,	Celeriac, or turnip-rooted.

Propagation.—All the sorts are raised from seed; and half an ounce is reckoned sufficient for a seed-bed four feet and a half wide by ten feet in length, of the upright sorts; but for celeriac, a quarter of an ounce will be enough for a bed four feet square.

Soil.—Celery delights in a soil rather moist, rich in vegetable mould, but not rank from new, unrotted dung.

Times of sowing.—"The most forward crop is slightly forced; any of the varieties may be sown in the spring, in the open garden, at two or three different times, from the 21st of March till the first week in May; but the principal sowing should be made in the first fortnight in April. Sow in beds of light mellow earth, and rake in the seed lightly and regularly. In very dry weather, give moderate watering both before and after the plants come up. When they are two, three, or four inches high, thin the seed-bed, and prick out a quantity, at successive times, into intermediate beds, three or four inches asunder. Water those removed until they have struck" [*taken root.*]—*Loudon.*

Transplanting into trenches.—"When either the plants left in the seed-bed, or those removed, are from six to twelve inches high, or when the latter have acquired a stocky growth, by four or five weeks' nurture in the intermediate bed, transplant them into trenches for blanching. For this purpose, allot an open compartment. Mark out the trenches a foot wide, and from three to three and a half distance; dig out each trench lengthwise, ten or twelve inches in width, and a light spit deep, that is, six or eight inches. Lay the earth dug out equally on each side of the trench; put about three inches of very rotten dung into the trench, then pare the sides, and dig the dung and parings with an inch or two of the loose mould at the bottom.

Trim the tops and roots of the plants, and then set them in single rows along the middle of each trench, allowing four or five inches distance from plant to plant. When this work is finished, give the plants water in plenty, and occasionally water them from time to time, if the weather be dry, and likewise let them be shaded, till they strike root, and begin to grow. When they have grown to the height of eight or ten inches, draw earth to each side of them, breaking it fine. This should be done in dry weather, being careful not to bury the hearts. Repeat the earthing once in ten days, till the plants are fit for use. Be careful, however, not to draw up too much earth to the plants at first, lest they be smothered, and leave the plants in a little hollow, that they may receive the full benefit of the waterings, rain, &c."

Taking the crop.—It is best to begin at one end of a row, and dig clean down to the roots, which then loosen with a spade, and they may be drawn up entire, without breaking the stalks.

To preserve this plant during the winter, on the approach of frost, take up a part of the crop, and lay it under sand for winter use. Those left in the beds may be covered with litter, to be removed in mild weather. Cobbett directs, to preserve celery in beds, as follows:—"Two boards, a foot wide each, their edges on one side laid upon the earth of the ridge, formed into a *roof* over the point of the ridge, the upper edge of one board going an inch over the upper edge of the other, and the boards fastened well with pegs, will do the business completely; for it is not the frost, but the occasional *thaws*, that you have to fear, and the *wet* and *rot* that they produce."

To save seed.—Either leave some established plants in the spring where growing, or in March, as soon as the frost will permit, set the plants in the ground, full two feet asunder.

Cultivation of celeriac.—The times of sowing are the same as for the other sorts. In the beginning or middle of June, they are transplanted into a flat bed in the open air, at the distance of fifteen inches from each other, and not in trenches, like other celery. They must be abundantly watered as soon as they are set out, and the watering must be repeated every other day, or, if the weather should be warm, every day. As they increase in size, they will require a greater quantity of water, and they must be occa-

sionally hoed. The roots will be fit for use in September or October. Sabine states, that he has been informed that the plan of giving excess of water is peculiar to this plant, and that its vigorous growth is more dependent on richness of soil than any other cause. Abercombie directs to earth up the bulbs four or five inches, after they are full grown, in order to blanch them.

"*Use.*—The blanched leafed-stalks are used raw, as a salad, from August till March; they are also stewed, and put in soups. In Italy, the unblanched leaves are used for soups, and when neither the blanched nor the green leaves can be had, the seeds bruised form a good substitute. The root only of the variety called the celeriac is used, and Sabine informs us (*Hort. Trans.* vol. iii.) 'it is excellent in soups, in which, whether white or brown, slices of it are used as ingredients, and readily impart their flavour. With the Germans, it is also a common salad, for which the roots are prepared by boiling, until a fork will pass easily through them: after they are boiled, and become cold, they are eaten with oil and vinegar. They are also sometimes served up at table, stewed with rich sauces. In all cases, before they are boiled, the coat and the fibres of the roots, which are very strong, are cut away; and the root is put in cold water, on the fire, not in water previously boiling.'"—*Loudon.*

CHAMOMILE.—*Anthemis nobilis.*

Varieties.—These are the common single and double-flowered.

Soil and culture.—This herb delights in a poor, sandy soil. "Both kinds are propagated by parting the roots, or by slips of the rooted offsets or of the runners. Detach them with roots in little tufty sets in March, April or May, and plant them from eight to twelve inches asunder, giving water. The flowers should be gathered in their prime, in June or July, just when full-blown. Let them be spread to dry in a shady place; then put them into paper bags, and house them for use."—*Abercrombie.*

"*Use.*—It is cultivated on account of the flower, which is a safe bitter and stomachic, and much used under the name of chamomile-tea. The double-flowering variety, though more beautiful than the single-flowered, is less useful; the aromatic principle not residing in the floscules of the ray, the multiplication of which constitutes the double flower. The double sort, however, is most cultivated by growers

for the market, on account of its greater bulk and weight." —*Loudon.*

CHERRY-TREE.—*Prunus cerasus.*—The cherry is a genus of plants, which comprise too many species to be described in this place. Loudon's catalogue contains thirty-six kinds, but does not include all that are cultivated in England; and there are several varieties in the United States, which are natives of the country. See *Thacher's Orchardist*, *Coxe on Fruit-Trees*, and *Domestic Encyclopedia*. Gen. Dearborn's communication for *N. E. Farmer*, vol. v. p. 210.

"The cherry-tree is propagated by seeds and by suckers, when stems are wanted; by seeds alone, when new varieties are required;* by scions, when you have to work on old subjects; and by buds, when your trees are young. If intended for dwarfs, bud your plants at *two*, and if for standards, at *four* years of age. The spring succeeding this operation is the time for transplanting; which should be done carefully, and in the manner prescribed for setting out apple-trees. The fashion or form of the trees will direct the distance at which they are to stand from each other; between standards this should not be less than thirty feet;† and between pyramids and espaliers, not less than twenty.

"Though in our climate all the varieties of the cherry-tree do well as standards and pyramids, and are therefore generally and properly cultivated in these forms, still it may be useful to remark, that two of them, the May duke and the Morello, when trained against walls, give fruit not only of increased precocity, but of much finer flavour; a circumstance in which they differ, not only from all other varieties of their own races, but from fruit-trees of all other kinds.

"As the cherry grows on small spurs, pushing from the sides and ends of two, three, and four years old wood, and as the procession of new buds is constant, it follows as a general rule, that 'the knife must be sparingly employed;' and as a particular one in relation to wall-trees, that 'bearing branches are not to be shortened, if room can be found for extending them.' These rules, however rigorously

* The seeds employed should be taken from ripe fruit, committed promptly to a bed of sand, and kept in a dry and cool place till the spring, when they may be set out in rows two and a half feet apart.

† Miller thinks the distance should be forty feet.

executed, must not prevent *summer* pruning, (which consists in rubbing off redundant or ill-placed buds,) nor that of *winter*, if confined to the renewal of fractured and unsound wood, or branches too much multiplied, or crossing each other. The nature of the Morello will, however, render it an exception to the general practice here recommended; for, instead of bearing like the other varieties, on two, three, and even four years old wood, its fruit is generally produced on shoots of the last year, and rarely, if ever, on even two years old wood. Whence it follows, that, with regard to this variety, our aim, in both summer and winter pruning, ought to be 'a removal of old, and a provision of new bearers.'

"In renovating an old tree, pursue Forsyth's method—shorten it to a stump not more than eighteen inches high; remove the old soil from the roots; replace it with that of upland pasture, on a layer of stone or other impervious body, two feet below the surface; and encourage a single shoot."—*Armstrong.*

Use.—"It is a refreshing summer fruit, highly grateful at the dessert, and affording pies, tarts, and other useful and elegant preparations in cookery and confectionary. Steeping cherries in brandy qualifies and improves its strength and flavour; a fine wine is made from the juice, and a spirit distilled from the fermented pulp. The gum which exudes from the tree is equal to gum arabic; and Haselquist relates, that more than two hundred men, during a siege, were kept alive for nearly two months, without any other sustenance than a little of the gum taken sometimes into the mouth, and suffered gradually to dissolve. Cherry wood is hard and tough, and is used by the turner, flute-maker and cabinet-maker."—*Loudon.*

"The common wild or native cherry, (*Prunus cerasus Virginia,*) though it bears only a small, bitter cherry, which serves as food for birds, is valuable on account of its medicinal bark, and also for its timber, which is of a reddish, streaked colour, resembling mahogany, and capable of receiving a fine polish; it is used by turners and cabinet-makers for many purposes. The tree grows to a large size.

"Cherry brandy is made in the following manner:—Fill the cask with an equal proportion of Morello and sweet black cherries; pour over them as much brandy as the cask will contain. When it has been on ten days, draw it off, and pour on hot water; let this remain some time, sha-

king the cask frequently, then draw it off, mixing the last with the first liquor."—*Domestic Encyclopedia.*

Dr. Cooper adds, in the last edition—"It is best made with the small wild black cherry." Cattle, it is said, have been killed by eating leaves of the wild cherry-tree. For a method of making cherry wine, see *N. E. Farmer*, ii. 27.

CHERVIL.—*Chærophyllum.*—This is an annual plant, with leaves resembling those of double parsley. It is used for salads and in soups, and is sown occasionally in rows, like parsley, from April to September.

CHIVE.—*Allium schænoprasum.*—"The *chive*, or *cive*, is a hardy perennial plant, a native of Britain, and found in meadows and pastures, though but rarely. The leaves rise from many small bulbous roots connected in bunches; are awl-shaped, thread-like, and produced in tufts. The flowers are white, tinged with reddish-purple, and appear on round stalks in June."—*Loudon.* It is of common and easy cultivation.

COLEWORT.—*Brassica oleracea viridis.*—"The original variety of cabbage, called colewort," says Loudon, "is, or seems to be, lost, and is now succeeded by what are called cabbage-coleworts. These, Abercrombie observes, are valuable family plants, useful in three stages; as young open greens, as greens with closing hearts, and as greens forming a cabbage growth." The culture and uses of the cabbage-colewort are so similar to those of the common white cabbage, that details on the subject would seem unnecessary.

It is said in *Gleanings on Husbandry*, &c. that colewort is "a name given by gardeners to a cabbage plant, to be cut for use from the time the leaves are as broad as a man's hand, till it begins to form a close head. They are generally raised from seeds of any of the best kinds of heading white cabbage; but those of the sugar-loaf are preferable to all others for eating."

CORIANDER.—*Coriandrum sativum.*—Coriander is a hardy annual plant, which originated in the East.

Culture.—This plant delights in a sandy loam. It is raised from seeds, which may be sown in March, or as soon as the frost will permit, when the weather is mild and dry. The quantity of seed requisite for a bed six feet long and four feet wide, sown in rows nine inches apart, is half an ounce. The seed should be buried half an inch.

Use.—The seeds have a pleasant flavour, and, when en-

crusted with sugar, are sold by the confectioners under the name of *coriander comfits.* They are also used in the bitter infusions and preparations of senna, the disagreeable taste of which they completely overcome, and for various other purposes, both by druggists and distillers.

CRESS, WATER.—*Sisymbrium nasturtium.*—A genus of plants, of which the principal is the common water-cress, found in springs and brooks. It is perennial, and produces white flowers that are in bloom in June or July. Lasteyrie tells us, that, in Germany, great pains are taken to propagate the water-cress, and gives the following account of their mode of doing it: "The water," says he, "most favourable for its production, is that in which it grows naturally, and which in winter preserves heat enough to prevent it from freezing. The situation on which to form a cress plantation ought to have a little slope or inclination, because water in a state of repose, alters the flavour of the plant. Having chosen the place, it is formed into heights and hollows alternately. the latter are destined for the cresses, and the former for the culture of other plants. The size of the hollows is made to depend on the quantity of water you can bring into them, and the demand for the article to be raised. If the soil of the hollows is not sufficiently rich, better earth must be brought to amend it, and if the bottom be marshy, you throw over it some inches of sand. Your next step is to cover it with water for some hours, after which you drain and sow or plant. At the end of a few days, you let in the water, and drain as before, and continue these processes until the cresses appear, if sown, or until they have taken root, if planted. The quantity of water let in is always to be regulated by the growth of the plant; for, though it cannot live but in water, it will not bear to be long covered with it. Planting is always surer than sowing, and is therefore preferred. The epoch for this is either March or August. The distance between the plants should not be less than ten or fifteen inches. Moving the earth about their roots with the hoe, from time to time, is useful; but for the rest, (having once taken root,) no further care is necessary. A cress plantation is in full bearing the second year, and lasts a long time. When it begins to fail, it may be renewed by taking off a foot of the surface soil of the old beds and replacing it with good and fresh earth. In winter, the beds are covered more deeply with water, which protects the plant against the frost."

The same writer informs us how they manage their cress plantations near Paris. "Having there," he says, "no running water, they cultivate it in the neighbourhood of wells, and water it every day. The cress vegetates promptly, but becomes acrid in its taste. They accordingly prefer sowing to planting, because, if cut when only six inches high, and treated, in all respects, as an annual, it has least of this pungency."—*Armstrong's Treatise.*

Loudon says, "Some market gardeners, who can command a small stream of water, grow the water-cress in beds sunk about a foot in a retentive soil, with a very gentle slope from one end to the other. Along the bottom of this bed, which may be of any convenient breadth and length, chalk or gravel is deposited, and the plants are inserted about six inches' distance every way. Then, according to the slope and length of the bed, dams are made six inches high across it, at intervals; so that, when these dams are full, the water may rise not less than three inches on all the plants included in each. The water being turned on will circulate from dam to dam; and the plants, if not allowed to run to flower, will afford abundance of young tops in all but the winter months. A stream of water, no larger than what will fill a pipe of one inch bore, will, if not absorbed by the soil, suffice to irrigate in this way an eighth of an acre. As some of the plants are apt to rot off in winter, the plantation should be laid dry two or three times a year, and all weeds and decayed parts removed, and vacancies filled up. Cress grown in this way, however, is far inferior to that grown in a living stream flowing over gravel or chalk."

Use.—"Water-cresses are universally used and eaten as an early and wholesome spring salad. Being an excellent antiscorbutic and stomachic, they are nearly allied to scurvy grass, but do not possess so great a degree of acrimony. They are also supposed to purify the blood and humours, and to open visceral obstructions."—*Dom. Encyc.*

CRESS, GARDEN.—*Lepidium sativum.*—The garden-cress is a hardy, annual plant, cultivated, says Loudon, since 1548; but its native country is unknown.

Varieties.—

Curled, or peppergrass, | Broad-leaved garden cress.

This plant is raised from seed, of which one ounce will suffice for a bed of four feet square.

Times of sowing, and site of the crop.—Cress should be raised three or four times every month, as it may be in de-

mand, to have young crops constantly in succession. Allot some warm situation for early spring sowing; and, if the weather be cold, either put on a spare frame, or cover with matting between sunset and sunrise. For autumnal sowings, when cold weather is approaching, allot some warm borders, and give occasional protection. "The cress," says Loudon, "is often raised on porous earthen ware vessels, of a conical form, having small gutters on the sides for retaining the seeds. These are called *pyramids*, are somewhat ornamental in winter, and afford repeated gatherings."

Process in sowing, and subsequent culture.—"Having allotted a fine, mellow soil, to receive the seed, dig the surface, and rake it finally, preparatory to sowing, which mostly perform in small, flat, shallow drills, four, five, or six inches asunder. Sow the seed very thickly, and earth over very lightly, or but just thinly cover. Give occasional waterings in warm, dry seasons."

Taking the crop.—"To gather cress in perfection, cut them while moderately young, either clean to the root, or only the tops of advanced plants. They will shoot again for future gathering, but the leaves will be hotter, and not so mild and tender as those of younger plants."

To save seed.—"Either sow a portion in the spring for that purpose, or leave some rows of any overgrown old crop in April or May. The plants will yield seed in autumn."

CUCUMBER.—*Cucumis sativa.*—Among the varieties of this species of plants, are,

Early Green cluster,	Long prickly,
Early frame,	White spined,
Long green Turkey,	Short prickly,
Long white Turkey,	Small girkin, or West India.

Soil.—In our climate, cucumbers will grow in any soil, though not with the same degree of vigour, provided they be supplied with a sufficiency of heat, light, water, and air. It is an object with many market gardeners and others, to produce cucumbers at an early period, and for this purpose artificial heat is necessary. For early forcing, Abercrombie recommends a mould or compost, of the following materials: "one third of rich top spit earth, from an upland pasture, one half of vegetable mould, and one sixth of well decomposed horse-dung, with a small quantity of sand.

Time of beginning to force.—Abercrombie says, "Managers, who have to provide against demands for early cucumbers, must raise seedlings from twelve to ten weeks before

the fruit will be required, according to the length of the days in the interval. In proportion as the entire course embraces a greater part of mid-winter, the liability of failure from obstacles in the weather will be greater. The last fortnight in January, or first week of February, is a good time for beginning to force the most early crop. In the subsequent months, both main and secondary crops may be started as required, and will come forward more freely. To have a constant succession, seedlings should be originated twice a month. As the course of forcing more coincides with the natural growing season, the length of it will be reduced to eight, seven, or six weeks." Nicol recommends the middle of January. He says, "Some begin sooner, but it is striving hard against the stream to little purpose. If the dung be prepared, and the bed be got ready, so as to sow about the 1st of February, the success will be often greater than by sowing a month earlier." Besides, cucumbers, produced altogether by the heat of dung, without the aid of the sun, are less wholesome and palatable than those which Nature affords in the due course of her operations.

Sorts.—Abercrombie recommends "the short prickly for very early fruit, and the long prickly kinds for the chief early and main summer crops." M'Phail prefers "the green cucumber with black prickles, as best for forcing. When fit for table, it runs from six to nine inches long, and, when ripe, runs to about eighteen or twenty inches long."

Choice of seeds.—"It is advisable," Abercrombie observes, "to have seed from two, at least, to four years old, in preference to newer seed, which is apt to run luxuriantly in vine, and the plants from it do not show fruit so soon nor so abundantly as those from seed of a greater age. But when seed has been kept more than four years, it is sometimes found to be too much weakened." Mr. Armstrong says, "A debate has long existed, on the preference to be given to *old* or *new* seeds, and which, like many others, appears to be interminable. The Abbé Rozier and his followers think that the most vigorous plants of all species and kinds are the best, and, accordingly, prefer new seeds, because more likely to produce such than old ones: while, on the other hand, their opponents maintain, that plants may have too much vigour, as well as too little; and that, whenever an excess of vigour exists, according to all vegetable analogy, it shows itself in the production of stems and

leaves, not in that of flowers and fruits—whence they conclude, that old cucumber seeds, (like those of all the rest of the *cucurbitaceæ*, family,) are better than new, because *less vigorous*. The best practical use to be made of this controversy, is to sow *old* seeds in the *spring*, when vegetation is most powerful, and *new* ones in *July*, when it begins to abate."

Forcing cucumbers.—"Towards the latter end of January, a quantity of fresh horse-dung should be procured with the litter among it, to which a small portion of sea-coal ashes may well be added. In the course of four or five days, the dung begins to heat, when a little of it may be drawn flat on the outside, and covered two inches thick with good earth; over which a bell-glass ought to be placed; and two days after, when the soil is warm, the seeds should be sown, covered with fresh mould one fourth of an inch thick, and the glass again set over it. This must be screened by a mat during the night, and in four days the young plants will germinate. As soon as they appear, the rest of the dung must be beaten close together into a bed for one or more lights, which bed should be three feet thick, and covered three inches deep with fine, fresh earth; the frame is then to be put on; and, during the night, or in bad weather, sheltered with mats. When the soil is hot enough, the young plants must be removed into it, and set at two inches distance, the glasses being occasionally raised to admit fresh air, and also frequently turned, to prevent the wet steam of the dung from dropping down on the plants. These ought to be watered at stated times, with tepid or luke-warm water; and, as they increase in size, should be earthed up; an operation which will considerably augment their strength. If the bed be not hot enough, fresh litter should be laid round its sides; but if it be too warm, it should be perforated with a stake to give vent to the heat; and, as soon as the bed acquires a proper temperature, the holes are to be closed up with fresh earth. When the plants begin to shoot their third or rough leaf, another bed should be prepared for them, similar to the first; and, when the soil is thoroughly warmed, they should be transplanted into it, in holes about a foot deep, and nine inches broad, filled with light, fine, fresh mould, laid in a hollow, circular form. In each of these holes four plants should be set, and shaded for two or three days from the heat of the sun, that they may strike root; after which time it will be useful to expose them to

the sun and air, as often as the weather will permit. When they have attained the height of four or five inches, they should be gently fastened down to the soil, in different directions; and the branches afterwards produced ought to be treated in a similar manner, as it will much contribute to forward their maturity. In the course of a month the flowers will appear, and, shortly after, the rudiments of the fruit. The glasses should now be carefully covered during the night, and the plants gently sprinkled with water in the day time. These will produce fruit till midsummer, and may be succeeded by a second crop, which is to be raised nearly in the same manner as the earlier cucumbers, with this only difference, that the former should be sown toward the end of March, or the beginning of April, and that it requires less care and attention."—*Dom. Encyc.*

The smallest degree of heat for forcing cucumber plants, at the coldest time of night, is 58 degrees; and the greatest heat necessary in the day time is 65 degrees.

"Well preparing the dung is of the greatest importance in forcing the cucumber, and if not done before it is made into a bed, it cannot be done after, as it requires turning and watering to cause it to ferment freely and sweetly; fresh dung from the stable will require at least six weeks' preparation before it will be fit to receive the plants. A month before it is made mto a bed, it should be laid into a heap, turned three times, and well shaken to pieces with a fork, and the outsides of the heap turned into the middle, and the middle to the outsides, that the whole may have a regular fermentation; and if any appear dry, it should be made wet, keeping it always between the two extremes of wet and dry. A dry spot of ground should be chosen to prepare the dung on, that the water may drain away from the bottom of the heap. The dung having been a month in heap, I make the bed as follows:—I form a stratum one foot high, of wood of any kind, but if large the better; (old roots of trees, or any other of little value will do;) this is to drain the water from the bottom of the bed; for, after a month's preparation, with every care, it will frequently heat itself dry, and require water in large quantities, which, if not allowed to pass off freely, will cause an unwholesome steam to rise, in which the cucumber-plant will not grow freely: on this bottom of wood I make the bed, four feet high, with dung, gently beating it down with a fork: this is done about the 1st November, and by the month of February, the four feet of dung will not be more than two feet thick, which, with the

foot of wood at the bottom, will make the bed three feet high; this I consider a good height, for, if lower, it cannot be so well heated by linings, which is the only method of warming it in the months of February and March, as by that time the first heat of the bed will have quite declined. Having made the bed, I put on the frames and lights, which I shut close till the heat rises. I then give air night and day, sufficient to allow the steam to pass off, and once in two days I fork the surface over, about nine inches deep, to sweeten it, and if, in the operation, I find any part dry, I carefully wet it. The bed being quite sweet, I prepare it for the mould, by making the middle about eight inches lower than the sides, as the sides are liable, from the weight of the frames, to settle faster than the middle, which often causes the hills of earth to crack, by which the roots of the plants are greatly injured."—*Hort. Trans.* vol. iii. p. 147.

Mr. Cobbett says, "If you wish to have cucumbers a *month earlier* than the natural ground will bring them, do this:—Make a hole, and put into it a little hot dung; let the hole be under a warm fence. Put six inches deep of fine rich earth on the dung. Sow a parcel of seeds in this earth; and cover at night with a bit of carpet, or sail-cloth, having first fixed some hoops over this little bed. Before the plants show the *rough* leaf, plant two into a little flower-pot, and fill as many pots in this way as you please. Have a larger bed ready to put the pots into, and covered with earth, so that the pots may be plunged in the earth up to their tops. Cover this bed like the last. When the plants have got two rough leaves out, they will begin to make a *shoot* in the middle. Pinch that short off. Let them stand in this bed, till your cucumbers *sown in the natural ground come up;* then make some little holes in good, rich land, and, taking a pot at a time, turn out the *ball*, and fix it in the hole. These plants will bear a *month sooner* than those sown in the natural ground; and a *square yard* will contain thirty-six pots, and will, of course, furnish plants for thirty-six hills of cucumbers, which, if well managed, will keep on bearing till September. Those who have *hot-bed frames*, or *hand-lights*, will do this matter very easily. The cucumber plant is very tender and juicy; and, therefore, when the seedlings are put into the pots, they should be *watered* and *shaded* for a day or two; when the balls are turned into the ground, they should be *watered*, and shaded with a bough for one day. That will be enough.—I have one observation to make upon the cultivation of cucumbers, melons of

all sorts, and that of all the pumpkin and squash tribe; and that is, that it is a great error to sow them *too thick*. One plant in a hill is enough; and I would put *two into a pot*, merely as a bar against accidents. One will bring more weight of fruit than two, (if standing near each other,) two more than three, and so on, till you come to fifty in a square foot; and then you will have no fruit at all! Let any one make the experiment, and he will find this observation mathematically true. When cucumbers are left eight or ten plants in a hill, they never shoot *strongly*. Their vines are poor and weak. The leaves become yellow; and, if they bear at all, it is poor, tasteless fruit that they produce. Their bearing is over in a few weeks. Whereas, a single plant, in the same space, will send its fine green vines all around it to a great distance, and, if no fruit be left to *ripen*, will keep bearing till the white frosts come in the fall.—The roots of a cucumber will go ten feet, in fine earth, in every direction. Judge then, how ten plants, standing close to one another, must produce mutual starvation!"

Mr. Armstrong has the following observations with regard to *early* cucumbers:—"To obtain these, we must have recourse to artificial heat; and with the less reluctance, as, of all plants, the cucumber is that with which it best agrees. To this end, therefore, scoop as many large turnips as you propose to have *hills;* fill these with good garden mould, sow in each three or four seeds, and plunge them into a hot-bed. The advantage of the scooped turnip, as a seed-bed, over pots or vases, will now appear; for, instead of the ordinary difficulty of separating the mass of earth and the plant from the pot which contained them, and without injury to either, we re-inter both pot and plant, and even find in the one an additional nutriment for the other. The subsequent treatment does not differ at all from that of plants sown and cultivated in the open air."—*Mem. of N. Y. Board of Agr.* vol. ii. p. 115.

Training.—To force the cucumbers into early fruit, Abercrombie directs to "stop the runners as soon as the plants have made two rough leaves: as the bud that produces the runner is disclosed at the base of the second rough leaf, it may be cut off or picked out; or, if the runner has already started, it may be pinched off close. This is called stopping at the first joint, and is necessary to promote a stronger, stocky growth, and an emission of fruitful laterals; and from these the prolific runners will be successively produced. The vines, without the process of stopping, would

generally be both weaker, and so deficient in fertile runners, that they would sometimes extend two or three feet without showing fruit. When plants, which have been once stopped, have extended the first runners to three joints without showing fruit, they are to be again stopped for the purpose of strengthening the plant, and disposing it for bearing. As fertile runners extend, train them out regularly along the surface, fastening them down neatly with pegs."

Upright training.—Cucumber plants being climbers by means of their tendrils, some branchy sticks being placed to any advancing runners, they will ascend, and produce fruit at a distance from the ground, of a clean growth, free from spots and well flavoured. "Mr. J. W. of Philadelphia informed Dr. Mease, that he enriched the ground near the trunk of a peach tree, and sowed some cucumber seed, which came up very abundantly. He pulled up all the plants but one, and permitted the vine to run up the tree. It bore 150 cucumbers. The numerous creepers with which the cucumber abounds, and the result of this experiment, would seem to point out the climbing nature of the plant, and the great advantage arising from permitting it to attach itself to a frame or tree, instead of confining it to the ground."—*Dom. Encyc.*

Setting the fruit.—"The cucumber," Abercrombie observes, "bears male and female blossoms distinctly on the same plant. The latter only produce the fruit, which appears first in miniature, close under the base, even before the flower expands. There is never any in the males; but these are placed in the vicinity of the females, and are absolutely necessary, by the dispersion of their farina, to impregnate the female blossom; the fruit of which will not otherwise swell to its full size, and the seeds will be abortive. The early plants under glass, not having the full current of the natural air, nor the assistance of bees and other winged insects to convey the farina, the artificial aid of the cultivator is necessary to effect the impregnation. At the time of fructification, watch the plants daily; and as soon as a female flower and some male blossoms are fully expanded, proceed to set the fruit the same day, or next morning at furthest. Take off a male blossom, detaching it with part of the footstalk. Hold this between the finger and thumb; pull away the flower-leaf close to the stamens and anthera or central part, which apply close to the stigma or bosom of the female flower, twirling it a little about, to discharge thereon some particles of the fertilizing powder

Proceed thus to set every fruit, as the flowers of both sorts open, while of a lively, full expansion; and generally perform it in the early part of the day; using a fresh male, if possible, for each impregnation, as the males are usually more abundant than the female blossoms. In consequence, the young fruit will soon be observed to swell freely. Cucumbers attain the proper size for gathering in about fifteen, eighteen, or twenty days from the time of setting; and often in succession, for two or three months or more, in the same bed, by good culture. The above artificial operation will be found both necessary and effectual in forcing the cucumber, between the decline of autumn and May, while the plants are mostly shut under glass. In plants more freely exposed to the free air, in the increasing warmth of spring, and in having the full open air in summer, from June or July till September, the impregnation is effected mostly or wholly by nature. The male flowers, being by some ignorantly denominated false blossoms, are often plucked wholly off as useless, under a notion of strengthening the plant: but this should not be generally done. Where crowded too thick in clusters, some may be thinned out moderately; but their agency being absolutely necessary in fertilizing the females, they should only be displaced as they begin to decay, except where they are superabundant."

Principal summer crop.—"The ground being dug and smoothed, line it into squares of six feet. In the centre of each, dig a hole about fourteen inches deep; fill this with well rotted dung, and sow on it five or six cucumber seeds: cover these with mould, and, when they rise and take a rough leaf, select two to each hill, and draw out the remainder. This sowing cannot be safely made in our climate till the 10th of May. For the fall and pickling crops, you must sow the first or second week in July."—*Armstrong.*

Those cucumbers, which are sowed as late as July, will not require topping or cutting off the runners as before directed, for at this season vegetation will be less vigorous and there will be less danger of the plant running too much to vine.

Raising plants from cuttings.—"Instead of raising cucumber plants from seed, they may be raised from cuttings, and thus kept on from year to year, in the following manner:—Take a shoot that is just ready for stopping, cut it off just below the joint, behind the joint before which the shoot should have

been stopped; then cut smooth the lower end of the shoot or cutting, and stick it into fine leaf or other rich mould about an inch deep, and give it plenty of heat, and shade it from the rays of the sun till it be fairly struck. By this method, as well as by that of laying, cucumbers may be propagated.

"Mearns, gardener at Shobden Court, near Leominster, propagates his cucumber-plants for a winter crop in this way, and "finds that the plants raised from cuttings are less succulent, and therefore do not so readily damp off, or suffer from the low temperature to which they are liable to be exposed in severe weather; that they come into bearing immediately, as they have formed roots of sufficient strength to support their fruit, and do not run so much to barren vine as seedlings are apt to do." He takes the cuttings from the tops of the bearing shoots, and plants them in pots nine inches deep, half filled with mould. He then waters them, covers the tops of the pots with flat pieces of glass, and plunges them into a gentle bottom heat. "The sides of the pot act as a sufficient shade for the cuttings during the time they are striking, and the flat glass, in this and other operations, answers all the purposes of bell-glasses. The cuttings form roots, and are ready to put off in less than a fortnight."—*Hort. Trans.* vol. iv. p. 411.

Cucumbers increased by layers.—"As soon as several flower-buds appear on a plant, bend the second or third joint of a branch below the blossom, fasten it firmly into the ground, and cut off the capillary point of the plant; it speedily takes root, and must be separated from the parent stock; as each root has only to supply a few fruits with nourishment, it saves room, labour and time, and affords a constant supply for eight, twelve and more months, which is not so liable to degenerate as if they were raised from a variety of seeds."—*Gleanings in Husbandry.*

Culture.—In the culture of all the crops, give proper supplies of water in dry, warm weather, two or three times a week, or every day when very warm and dry. If the heat in the hot-beds, after three or four weeks or more, be much declined, and the nights or general season remain cold, let a moderate lining of hot dung be applied to both sides; which will not only cause a reviving heat, but widen the bed for the roots and runners of the plants to extend.

Insects.—"The fly, which is often very destructive to cucumbers, melons and pumpkins, may be killed by sprinkling a mixture of tobacco water and red pepper over the vines."—*Dom. Encyc.* Sprinkle the plants with a strong

infusion of elder leaves; that of hops and of walnut leaves is likewise recommended; or, suspend a diamond-formed piece of white paper, shingle, or other piece of wood, by a thread, tied to the end of a stick stuck in the ground at a small distance from the hill, so that the paper shall hang directly over the hill and near the plants. The air, by constantly vibrating the paper or shingle, will have a tendency to prevent insects from alighting on the plants. The surest way, however, is to enclose the hills with frames covered with gauze, or other cloth of a light texture. The following method of making sieves, or boxes, to protect cucumber vines, melon vines, &c. against the yellow bug, &c. was communicated to the editor of the *N. E. Farmer* by Mr. Levi Bartlett, of Warner, N. H. and published in that paper, vol. ii. p. 305.

"Take a strip of pine board (about three fourths of an inch in thickness is most suitable) eight or ten feet in length, and four or five inches in width—plough one edge of it with a carpenter's plough or match plain—then mark off an equal number of side and end pieces; before sawing the side pieces, run a brad-awl through where you want to drive your nails, as it is not so likely to split, as after it is sawed. The side pieces eleven inches long—ends eight inches long. They must be of this particular size, because one yard of millinet will just cover nine boxes; or a third of a yard will make three covers. After having nailed your boxes, and divided your millinet, have some thin strips or tongues, as the carpenters call them. Press these with the edges of the covers into the groove, which fastens them much cheaper and more expeditiously than small nails. I made about twenty last season, and they effectually secured them from the yellow bug, and (by sinking the edges of them in the earth a little) from worms. But if they were of no use but to guard against insects, they would be worth having, as they keep off the cold winds, and greatly promote the growth of the vines in the early part of the season."

To save seed.—"Select some best summer fruit from good, productive plants, which permit to continue in full growth till they become yellow. Then cut them from the vine, and place them upright on end, in the full sun, for two or three weeks; when they may be cut open, and the seed washed out from the pulp; spread it to dry and harden; then put it up in papers or bags for future sowing. It will remain good for many years; and seed of three or

four years' keeping is preferable for early frame crops."—*Abercrombie.*

Uses.—"Cucumbers are a salubrious, cooling fruit, and may be safely allowed to consumptive patients, as they sweeten acrid humours, at the same time are gently laxative; but being in a considerable degree acescent, and sometimes attended with flatulency and diarrhœa, such effects may be prevented by eating them with great moderation; or with the addition of vinegar and pepper, which counteract their natural coldness. If properly pickled, (without colouring them with that poisonous metal, copper, or rendering them too acrid with stimulant spices,) they are an excellent antiseptic; yet we consider them highly improper either for children or wet nurses."—*Dom. Encyc.*

CURCULIO—an insect found in apples and other fruits.—*See* INSECTS.

CURRANT.—*Ribes.*—There are several species of currants, of which the principal are the common red currant, the white currant, and the black currant.

Soil and site.—All the sorts are very hardy, will grow freely and bear plentifully, almost any where, alike in open and shady situations, by which the fruit may be obtained early in June and July, and prolonged for several months in succession till October. As to soil, the currant generally does well in any common garden ground, well tilled and recruited; it bears the greater crop in a strong loam, or improved clay, somewhat moist; the earlier in a sandy light mould, which is not poor. Previous to planting, the ground should be dug two feet deep.

The following directions for the cultivation of the currant are taken from the *Amer. Phil. Trans.* vol. i. 1st series.

"Plant them round the quarters in the garden, that they may have the benefit of the manure and culture annually bestowed thereon, which will consequently make the berries large and the juice rich. The red currant is preferable to the white, as yielding richer juice, and in much greater quantity.

"Take the most luxuriant slips or shoots of a year's growth, set them in the ground about eight inches deep, and not less than twenty-four inches distant from each other: these never fail of taking root, and generally begin to bear in two years. For the rest, let them, from time to time, be treated as espaliers, (but not against a wall,) observing to keep the roots from suckers and grass.

"The goodness of the currant depends upon their hav-

ing the full benefit of the sun and air, to maturate and give the berries a proper balsamic quality, by exhaling a due proportion of their acid watery particles."

M'Mahon observes, that "The only proper method of propagating gooseberries and currants is by cuttings; suckers should never be resorted to, except in cases of necessity, for such will always produce others numerously from their roots, which carry off the nourishment, that ought to go to the support of the fruit; and, besides, they form such thickets, as to smother, and deprive them of the benefit of a free circulating air.

"The proper cuttings for planting are the shoots of the last summer's production, of straight, clean growth; they should be taken from healthy trees, and such as are remarkable, according to their kinds, for bearing the finest fruit; let each be shortened from about ten to twelve or fifteen inches long, according to its strength.

"Previous to planting, cut off every bud as close as possible to the shoot, except three, four or five, near the top; which are to be left to form the head of the plant. Some people imagine, that the buds of those parts inserted in the earth grow into roots, which is by no means the case, nature never having designed them for such; the roots, or fibres, always strike out through the clean and smooth bark, but generally a little below a bud, and sometimes at the lower extremity of the cutting, from between the bark and the wood." The cuttings may be first planted in rows, eighteen inches or two feet asunder, and about eight or nine inches apart in the rows. When they have had one or two years' growth in these rows, they may be planted out either in autumn or early in spring, where they are intended to produce fruit. Dr. Thacher directs to "let no limbs grow nearer than six inches of the ground. Prune the shrub every year, and keep it thin of wood, leaving the middle open; the limbs extended; and, when these get about three feet in length, cut off, every spring, all the last year's shoots. To cultivate on an extensive scale for the purpose of making wine, set the bushes in rows, six or eight feet between each bush, with intervals of proper width, and at regular distances for passing across the rows. It is estimated that an acre well cultivated will probably yield on an average a quantity of fruit sufficient to make one thousand gallons of wine annually. The expense of making this wine is about fifty cents a gallon.

"The common black currants are larger than the red or

white, but they have a peculiar flavour, which to some persons is unpleasant; they are, however, wholesome, and afford a juice which, when made into syrup with sugar, is much esteemed in sore throats and quinsies. The officinal black currant has a small berry, but is highly valuable as a medicine when made into wine. In lung fevers, putrid fevers, and ulcerous sore throats, and in putrid dysentery, the medicinal properties of this wine are not to be surpassed."—*Thacher's Orchardist*, p. 225.

The following receipt for the manufacture of currant wine is by Dr. Green, of Mansfield, Mass.

"Let the currants be fully ripe, and freed from all leaves, webs of insects, and decayed or defective fruit; break and press out the juice, and to every gallon of juice add two gallons of water, and to every gallon of this mixture three and one fourth pounds of good clean sugar, one gill of good brandy, and one fourth of an ounce of alum pulverized. Mix well together, and put the same into a clean cask. To expedite the process, ascertain the number of gallons the cask intended for the wine will contain—calculate the proportions of the ingredients—put into the cask the juice, brandy and alum—dissolve the sugar in water, and fill the cask, and with a stick mix the whole together.

"In the month of March following, draw off the wine, adding one gill of brandy to a gallon, and the wine is excellent, and improves by age. After the wine is drawn off, the residue may be worked into vinegar, or be suspended in a thick bag, in a cool place, that the remaining wine may filter out and be saved."

A kind of wine has been manufactured from the black currant, by Samuel Wyllys Pomeroy, of Brighton, Mass. which has been much celebrated for its medicinal properties. Dr. John G. Coffin, editor of the *Boston Medical Intelligencer*, says of this wine, "It has all the good properties of the best Port, without any of its heating or constipating effects. We could name several instances, where, in great debility and exhaustion, after protracted and severe fever, and from other causes, nothing else could be thought of, or taken with pleasure or advantage, in which this wine proved grateful to the palate, and most friendly to the stomach; in which, indeed, it was the principal means of conducting the patient to health and strength."

"Its exhibition has been attended with remarkable success in the early stages of cholera and dysentery,—and again also in the later stages of these diseases, after the

symptoms of inflammation or febrile excitement had ceased. It has been strikingly remedial in the low states of typhoid and bilious fever. The late Capt. Gilchrist, who for several years followed the Batavia trade, and who had always suffered an attack of the severe cholera, which proves so destructive of human life in that climate, used to say that after he had this wine with him, and took two glasses of it every morning, he escaped the disease. On one voyage, his mate, who had not taken the wine, was seized with this complaint, when a bottle or two stopped its progress. We have not room to enumerate many other morbid affections, in which this wine has proved useful. In *sore throat* it has, for many years, been considered almost a specific reme dy."

CUTTINGS, *or* SLIPS.—The branches, twigs or slips of plants, shrubs or trees, may, sometimes successfully, be cut off, and set in the ground to take root and grow. The best time for this operation is from the middle of August to the middle of April; but when it is done, the sap ought not to be too much in the top; neither must it be very dry or scanty, for the sap in the branches assists it to take root.

When you intend to propagate trees for timber, or for a tall, stately growth, be very particular never to take the cuttings from horizontal branches, for they will ever have an inclination to grow in a spreading manner; always make choice of perpendicular shoots, and particularly those that terminate the branches; these will produce the straightest trees.

The power of protruding buds or roots resides chiefly at the joints, or those parts where leaves or buds already exist. Cuttings should, therefore, be cut smoothly across at an eye or joint. This cutting ought to be made in the wood of the growth of the preceding season, or in the point between the two growths. It is a common practice to cut off the whole or part of the leaves of cuttings, which Loudon says is attended with bad effects.

"Cuttings which are difficult to strike may be rendered more tractable by previous ringing; if a ring be made on the shoot which is to furnish the cutting, a callus will be created, which, if inserted in the ground after the cutting is taken off, will freely emit roots. A ligature would, perhaps, operate in a similar manner, though not so efficiently; it should lightly encircle the shoot destined for a cutting, and the latter should be taken off when an accumulation of sap has apparently been produced. The amputation in the case

of the ligature, as well as in that of the ring, must be made below the circles, and the cutting must be so planted as to have the callus covered with earth."—*Hort. Trans.* vol. iv. p. 558.

"The insertion of the cuttings may seem an easy matter, and none but a practical cultivator would imagine that there could be any difference in the growth, between cuttings inserted in the middle of a pot, and those inserted at its sides. Yet such is actually the case, and some sorts of trees, as the orange, ceratonia, &c. if inserted in a mere mass of earth, will hardly, if at all, throw out roots, while, if they are inserted in sand, or in earth at the sides of the pots, so as to touch the pot in their whole length, they seldom fail of becoming rooted plants. Knight found the mulberry strike very well by cuttings, when they were so inserted, and when their lower ends touched a stratum of gravel, or broken pots; and Hawkins, (*Hort. Trans.* vol. ii. p. 12,) who had often tried to strike orange trees without success, at last heard of a method, by which, at first trial, eleven cuttings out of thirteen grew. The art is to place them to touch the bottom of the pot; they are then to be plunged in a bark or hot-bed, and kept moist."

"The management of cuttings, after they are planted, depends on the general principle, that, where life is weak, all excesses of exterior agency must have a tendency to render it extinct. No cutting requires to be planted deep, though such as are large ought to be inserted deeper than such as are small. In the case of evergreens, the leaves should be kept from touching the soil, otherwise they will damp, and rot off; and in the case of tubular-stalked plants, which are in general not very easily struck, owing to the water lodging in the tube, and rotting the cutting, both ends may, in some cases, (as in common honey-suckle,) be advantageously inserted in the soil, and, besides a greater certainty of success, two plants will be produced. Too much light, air, water, heat or cold, are alike injurious. To guard against these extremes in tender sorts, the means hitherto devised is that of enclosing an atmosphere over the cuttings, by means of a hand or bell-glass, according to their delicacy. This preserves a uniform stillness and moisture of atmosphere. Immersing the pot in earth, (if the cuttings are in pots,) has a tendency to preserve a steady, uniform degree of moisture at the roots; and shading, or planting the cuttings, if in the open air, in a shady situation, prevents the bad effects of excess of light. The only method of regulating the heat is by double or single cover-

ings of glass or mats, or both. A hand-glass placed over a bell-glass will preserve, in a shady situation, a very constant degree of heat. Whatever degree of heat is natural to the mother plant, when in a growing state, will, in general, be most favourable to the growth of cuttings."—*Loudon.*

The same writer says, "Every variety of apple may be grown from cuttings; though some with much greater facility than others. All those of the burknot and codling tribes grow as well this way as by any other, and some allege, that the trees so raised are not liable to canker, (*Hort. Trans.* vol. i. p. 120,) which is supposed to be owing to their 'putting out no tap-root, but spreading their numerous fibres from the knot or bur horizontally.' Even the golden pippin may be continued in this way, and the trees have remained seven years in perfect health, when grafts taken not only from the same tree, but from the very branch, part of which was divided into cuttings, cankered in two or three years. 'All apple-trees raised in this way,' Biggs observes, 'from healthy one-year-old branches, with blossom-buds upon them, will continue to go on bearing the finest fruit, in a small compass, for many years. Such trees are peculiarly proper for forcing, and not liable to canker.'—*Hort. Trans.* vol. i. p. 65. The cuttings are to be chosen from the young wood of horizontal or oblique branches, rather than from upright ones; from six to eight inches or more in length, with a small portion of old wood at the lower end. Cut off the tip of the shoot, and all the buds, excepting two or three next the tip or upper extremity; then smooth the sections at the lower end, and insert them three or four inches in sandy loam, pressing the earth firmly to them, watering, and covering with a hand-glass. The proper time for this operation is early in February, and the glass should not be touched, excepting to give water, till the shoots have sprung an inch or two. Shade during the mid-day sun, and begin to harden by giving air in July; finally, remove the glass in August; and in October transplant to nursery rows, or in pots, according to future intention. With the burknot tribe, all that is necessary is to plant the cuttings in a shady border, and treat them like those of the gooseberry or currant."

DANDELION.—*Leontodon taraxacum.*—This is a hardy perennial plant, which is found growing spontaneously in Great Britain and the United States. Loudon says that this vegetable, "though regularly produced in London market, is seldom or never cultivated, being generally to be found

in sufficient luxuriance by the sides of hedges and dry ditches. It might easily be propagated either by seeds or roots; and, if introduced as a garden plant, should have a rich, deep soil, and be carefully tied up and earthed round to blanch it effectually. Cut off all the flowers as they appear, to prevent the dispersion of the seed, and the weakening of the plant. When salad is scarce, the dandelion might be dug up from road-sides in winter, and forced in pots like succory.

"*Use.*—The leaves in early spring, when just unfolding, afford a very good ingredient in salads. The French sometimes eat the young roots, and the etiolated [blanched or whitened] leaves with thin slices of bread and butter. When blanched, the leaves considerably resemble those of endive in taste. The root is considered an equally good substitute for coffee as chiccory, and may, like that plant, be stored in cellars and barrels, for producing winter salad." —*Caled. Hort. Mem.* iv. 138. In this country, the dandelion has, we believe, been used for greens, or pot-herbs only, and we have never known it subjected to cultivation.

DIBBLE—a tool used by gardeners and farmers in Europe, chiefly in transplanting. It consists of a stick about a foot or eighteen inches long, slightly sharpened at the end, with which a hole is made to receive the plant or seed. It may be made of the upper part of an old spade or shovel handle, sharpened a little at the lower end. The common dibble is about eighteen inches long. The long dibble, used for potatoes, is about three and a half feet long.

The following method of making holes for beans has been recommended, viz.—Take a plank of oak, of such size as a man can easily manage, by a handle fixed upright in the middle of it, and of such thickness as not to give way in working; in the under part of this plank let there be fixed wooden pegs of such length, and at such distance from each other, as may form proper holes in the ground for the beans: when the land has been properly prepared, the workman must thrust the pegs of this instrument into the ground, and proceed sideways, managing it so that there may be the same distance between the last row of holes made by the first impression and the first row made by the next, as there is between the rows of any one impression. The youngest children may be taught to follow the instrument, and drop a bean into every hole that it makes.

DILL.—*Anethum graveolens.*—Dill is a hardy biennial

plant, a native of Spain, somewhat similar to fennel, but smaller. It is raised from seed sown in any of the autumnal months, or very early in the spring. Half an ounce of seed is sufficient for a bed three feet by four feet. M'Mahon directs to sow dill broad-cast on four feet wide beds, covering it, if sown in autumn, half an inch, and if in spring, a quarter of an inch deep: when the plants come up, thin them to six inches distance, and the same season they will perfect their seeds; which, if any are suffered to shed, will not fail to come up plentifully the next year. The seeds and leaves of this plant are used for giving a flavour to pickles, and also occasionally in soups and sauces. It is also used in medical preparations.

DRAINS.—Drains used in agriculture may be divided into two kinds, open and covered. They should be of a size and depth proportioned to the extent of the tract which it is wished to drain, and the probable quantity of water for which they are designed to be channels. They should, generally, be carried through the lowest and wettest part of the soil. It is a rule in making drains, to begin at the lowest place, and work upwards, by which means the water will pass from the workmen, and point out the level. The mud and other materials, which are dug out of a ditch or drain, should not be suffered to lie in heaps by the side of the ditch, but should be spread as equally as possible over the surface of the drained land. In some cases, it will be expedient to transport the earth taken from ditches to the farm-yard or the hog-pen, to form a part of that layer, which good farmers generally spread over those places, to imbibe liquid manure, or make into compost. In many instances, it is asserted, that the earth dug out of ditches, is worth enough for manure, to pay for the expense of digging the ditches.

Open drains often answer the purpose not only of conveying off superfluous water, but serve for enclosing fields. But they make a hazardous and inconvenient fence without the addition of a bank, hedge, or railing. The *Farmer's Assistant* says, "When a ditch is made for a fence, it ought to be four feet wide at the top, one or less at the bottom, and about two and a half deep; with the earth all thrown out on one side, and banked up as high as possible." Sir John Sinclair states, that "it is a general rule, regarding open drains, with a view of giving sufficient slope and stability to their sides, that the width at top should be three times as much as that which is necessary at the bottom; and,

in the case of peat mosses, or soft soils, it should be such as to allow the water to run off without stagnation, but not with so rapid a motion as to injure the bottom."

The American editor of Sir John Sinclair's *Code of Agriculture* observes, that "The most expeditious, effectual, and economical mode of making a drain would undoubtedly be, to use oxen, and a *scraper*, or ox-shovel, as it is sometimes called,—an instrument well known in this country in the making of roads. In some cases, this mode might not answer, as in very miry grounds, and lands just cleared of timber. But where lands are very miry, if the process is begun at the outlet of the water,—and there, indeed, it ought always to be begun,—the next adjoining portion will, generally, be made so dry as to allow being trodden upon in a proper season; and in this way a drain may by degrees be carried on towards the centre. In nineteen cases out of twenty, drains may probably be effected in this mode. Where the ground will admit of it, two men and a boy, and two yoke of oxen, will accomplish more business of this sort in a day, than half a dozen men in the same time, with only spades and shovels. Wherever the labour of cattle can be substituted in this country for human labour, policy requires it to be done. The surface of wet and miry land is usually full of inequalities; if a *scraper* is employed in draining them, the earth taken from the drain is easily landed in any hollow spot which needs to be filled; and if there are no such hollows, or they have already been filled, the earth may be spread over the surface in such a manner as to do the most good. If the earth is not wanted for other purposes, it is recommended to drop and spread it, if practicable, in such a manner as to leave the general surface of the land sloping towards the drain, that the water may the more readily incline towards it, and pass off. At some distance below the surface, in peat grounds, there is usually found a hard stratum of earth, called, in the common language of our farmers, *hard pan*. The hard pan, if ploughed into, scraped out, and spread on the surface, would greatly improve the texture of such soils. This furnishes another argument in favour of using a scraper in draining, for in no other way can the upper earth, taken out of the drains, be so cheaply removed, and put on the adjoining; nor in any other way can the hard pan be so easily broken up and carried off; nor in any other way, oftentimes, can suitable earth be so well obtained, for the purpose of spreading it over the surface with a view to improve the texture of the

soil. If the object be to pile the earth from the drains into heaps, with a view to composts, this purpose is completely accomplished by means of the scraper."

To make a covered drain, dig a channel between thirty and thirty-six inches wide at the top, and six inches, or the breadth of a spade, at the bottom, and three feet deep, giving it just descent enough to make the water run briskly. Fill it half full or more of small stones, thrown in at random, and cover them with a layer of straw, leaves, or the small branches of trees with the leaves on them; then fill it up to a level with the surface, with the earth that was thrown out.

In forming small drains, chiefly for retentive soils, the common plough may be used. A mode described in *Young's Annals of Agriculture*, from very ample practice, is his: he says, when he has marked the drains in a field, usually a rod asunder, he draws two furrows with a common plough, leaving a balk betwixt them, about fifteen inches wide; then, with a strong, double-breasted plough, made on purpose, he splits that balk, and leaves a clean furrow fourteen or fifteen inches below the surface; but where the depth of soil requires it, by a second ploughing he sinks it to eighteen or twenty inches; it is then ready for the land-ditching spade, with which he digs, fifteen inches deep, a drain as narrow as possible. But the method followed by some farmers, who do not possess ploughs made on purpose for the work, is this: with their common plough, drawn by four or five horses, and usually stirring about four or five inches deep, they turn a double furrow, throwing the earth on each side, and leaving a balk in the middle. This balk they raise by a second bout, in the same manner; then they go in the open furrow twice, with their common double-breast plough, getting what depth they can. After this, they shovel out all the loose mould and inequalities to the breadth of about a foot; and thus having gained a clear, open furrow, the depth varying according to the soil and ploughs, but usually about eight or nine inches, they dig one spit with a draining spade sixteen inches deep, thus gaining in the whole twenty-four or twenty-six inches. But as this depth is seldom sufficient, when necessary, they throw out another, or even two other spits, which makes the whole depth from thirty to forty inches.—*Loudon.*

Turf-covered drains may be made as follows:—Turn up a deep furrow with a strong plough, clear the sod from the

earth thus turned up, reduce it to about three inches in thickness, and then place it in the furrow from whence it was taken. The grassy side being placed uppermost, there is a hollow beneath, sufficient to discharge a considerable quantity of surface water, which readily sinks into it. This mode of draining is used on the sheep farms of the Cheviot Hills in England, and is recommended by Sir John Sinclair. It would not answer, however, in lands exposed to the tread of heavy cattle, as they would be apt to push their feet through a covering of turf of no more than three or four inches. Perhaps, in a few years, the verdure would thicken, and the sward strengthen over drains of this kind, so that there would be nothing to apprehend from the tread of the heaviest animals.

Cultivation of drained land.—It is well known that swamps, marshes, and other low lands are commonly places of deposit for the lighter and more fertile parts of the soil, washed from the neighbouring hills. Many marshes are in fact intervale land, naturally too wet for profitable cultivation. Wet lands, which receive the wash of higher grounds of a tolerable quality, may be expected to be worth considerable expense in draining. A bog, however, on the top of a hill, not overlooked by high ground, we should suspect of barrenness, and would not be at great expense in draining it, without examining and analyzing the soil in various parts, and becoming satisfied of its fertility. But a drained marsh, which can be flooded at the will of its owner, by means of a dam at its outlet, with water which has washed the neighbouring uplands, may be considered as inexhaustible, and, perhaps, had better be appropriated to the raising of hemp. That plant exhausts the soil very much, and it would, therefore, be good economy to raise it where the land can be recruited without manure from the farm-yard, &c. If the land is rich, not very dry, or water can be set back in the ditches, in a dry time, to within three or four feet of the surface, it will be quite an object to introduce fowl meadow, (*Agrostis stricta.*)

It is often advisable to let drained lands lie over one summer to ferment and rot, before any attempt to cultivate them. Flooding them completely in the winter, and drawing the water quite off rather late in the spring, will likewise assist in rotting the sod.

DUCK.—"Ducks are excellent *vermin pickers*, whether of caterpillars, (such as are within their reach,) slugs, snails and others; and ought to be turned into the garden

one or two days every week, throughout the season. Never keep them longer in than two or three days at a time, else they tire of their food, and become indolent. While here, they should be offered no food, but may have a little water set down to them, if there be no pond or stream in the garden.

"They are very fond of ripe strawberries or gooseberries; and, while they can get at these, will seek little after snails, or other insects; but they are most useful before these come into season for them. There are some kinds of vegetables they have a liking to, and on which they will fall, if vermin be any wise scarce; therefore, when this is perceived, they should be turned out. Never turn them into the garden in the time of heavy rains, or in continued wet weather; as, in that case, and particularly if the soil be stiff, they patter and harden the surface, to the great injury of small crops, and rising seeds."—*Nicol.*

EGG-PLANT.—*Solánum melongena.*—"There are two varieties of this plant, the white-fruited and the purple, cultivated for culinary purposes; the latter kind is preferable, and, when sliced and nicely fried, approaches, both in taste and flavour, nearer to that of a very nice fried oyster, than, perhaps, any other plant.

"This delicious vegetable may be propagated by sowing the seed on a slight hot-bed, the beginning of April, or in March; and towards the latter part of May, they should be planted in a rich, warm piece of ground, at the distance of two feet and a half asunder, every way, for the purple, or two feet for the white kind; and if kept clean, and a little earth be drawn up to their stems, when about a foot high, they will produce plenty of fruit. Or, the seed may be sown about the end of April, on a warm border, and planted out finally the beginning of June; but these will be rather late, and not produce fruit so abundantly, in the Middle or Eastern States, as by the former method."—*M'Mahon.*

ELDER.—*Sambucus nigra.*—This shrub grows plentifully in most or all parts of the United States, and is too well known to need description. Something, however, may be said with regard to its uses, some of which may not be so well known.

"This tree, professor Martyn observes, is a whole magazine of physic to rustic practitioners, nor is it quite neglected by more regular ones. An excellent healing ointment is made of the green, inner bark, which is also purgative in moderate, and diuretic in small doses. A decoction

of the flowers promotes expectoration and perspiration, and they give a peculiar flavour to vinegar. The flowers are reported to be fatal to turkeys, and the berries to poultry in general. No quadruped will eat the leaves of this tree; notwithstanding it has its own *phalæna* and *aphis*. The wood is used by the turner and mathematical instrument maker; and is made into skewers for butchers, tops, angling rods, and needles for weaving nets."—*Loudon.*

Willich says, "The leaves are eaten by sheep, to which it is of great service, when diseased with the rot; for, if placed in a situation where they can easily reach the bark and young shoots, they will speedily cure themselves."

The expressed juice of elder leaves, it is said, will kill skippers in cheese, bacon, &c.; and strong decoctions of it, poured or sprinkled over plants, are said to be fatal to insects.

In Europe, this shrub is sometimes propagated, but in this country, to destroy it is commonly an object of more consequence to the cultivator. It was remarked by the Rev. Dr. Jared Elliot, in his *Essays on Field Husbandry*, that "Elder bushes are stubborn and hard to subdue, yet I know by experience that mowing them five times a year will kill them."

To make elder-berry wine.—One bushel, when picked from the stalks, produces three gallons, or upwards, of berries; put these to seven gallons of soft water; after standing forty-eight hours, put them into the copper, let them boil one hour, then press the juice through a coarse cloth; then put the liquor into your copper again, with twenty pounds of raw sugar, half a pound of Jamaica ginger, bruised, one ounce of cloves, and one ounce of allspice. Boil the whole together one hour, then put it into a tub, and, when cold enough, add some good yest spread on a toast, and in two days put it all into a cask, and lay the bung lightly on for two months; then add one quart of brandy; this wine will keep for several years.

ELECAMPANE.—*Inula.*—This plant is found wild in moist pastures, both in Europe and America. It may be propagated either by seeds, sown in October, or offsets, which, if carefully taken from the old roots, with a bud or eye to each, will take root freely. M'Mahon directs to set such offsets in rows, about a foot asunder, and the same distance plant from plant in the rows. They will be fit for use after two years' growth, but will abide many years if permitted to stand. But young roots are preferable to those which are old, as they become tough and stringy by age.

Use.—This is a plant of some repute in medicine. It is said to strengthen the stomach and promote perspiration. An infusion of the roots, sweetened with honey, is useful in hooping cough. If liberally taken, they are diuretic, and said to be of great service in removing visceral obstructions. A decoction of this plant has been employed by farmers for the cure of scab in sheep; and externally applied for removing disorders of the skin. The fresh roots beaten in a mortar, with new butter, and applied externally, are said to cure the itch, scald head, &c.

ENDIVE.—*Cichorium endivia.*—The endive is a hardy annual, a native of China and Japan, and introduced into Great Britain in 1548. The varieties are

Green curled leaves, | White curled leaves, | Broad-leaved Batavian.

Estimate of sorts.—"All the sorts are eligible for culture; but allot, principally, the green curled for the main crops of autumn and winter endive, this being of the most stocky, full growth, and hardiest to stand severe weather. As to the others, allot a smaller portion of the white curled for early summer and autumn use: of the broad-leaved kind, provide a moderate crop for autumn, till November or December; being by some esteemed preferable for stews and soups, though not much used in salads."

Propagation.—All the varieties are raised from seed, of which, for a seed-bed four feet by ten in length, half an ounce is sufficient.

Times of sowing.—"The proper seasons are, May, for a smaller early crop; and principally June and July to the beginning of August; for full and successive crops, all autumn and winter, till the following spring. For, if sown earlier than the middle of May, or beginning of June, they will mostly run to stalk the same season, before attaining mature, useful growth. If any are required for early young summer endive, sow only a small portion of the white curled in April or May, as the plants will soon run to seed. In the middle, or towards the end of May, you may begin sowing moderately of the different sorts; but do not sow fully til nearly the middle of June, that the plants may stand without running to seed the same year. About the twelfth and twenty-fifth of that month, also at the beginning and middle of July, sow the main and successive crops, for autumn and winter; and a finer smaller sowing about the beginning of August, for late supplies in the end of winter and following spring.

Culture in the seed-bed.—"Sow each sort separately in

beds of rich, mellow earth, in an open situation, scattering the seeds thinly, and rake in the seed. When the plants are up an inch or two in growth, thin them moderately, where in clusters, that they may have room to grow stronger and stocky, for transplanting. But if a portion are sown in soil of sufficient depth, and thinned to the distances mentioned under *transplanting*, instead of being moved, they may be expected to produce heads of the finest kind, under the same culture as is given to the others.

Transplanting.—"As the plants attain a sufficient growth, being from four to six inches high, or in a month or five weeks from the time of sowing, proceed to transplant the successive crops. The ground should be light and rich, on a dry sub-soil. Dig it a full spit deep; set in shallow trenches or drills the depth of a hoe, endive blanches with less trouble than if inserted on a level surface. The lines may be fifteen inches asunder; the plants ten or twelve inches distant in the lines. Drawing the strongest first, plant out portions from June to October; but the principal removals will fall in August, in which month three different plantings may be made for succession; also for a general winter crop, at the beginning of September. While the plants are in hand, trim the extremities of the leaves, and shorten the tap roots a little; water at planting, and moderately afterwards, once in two days, if the weather be dry, till the plants take root. At the end of September, and in October, likewise, plant some in a warm, dry border, to stand the winter more effectually. Also, in the last fortnight of October or beginning of November, it would be proper to insert some stout plants, thickly, on a bank of dry, light soil, raised a foot or two behind, sloping to the south. Thus they will remain drier in winter, and will be preserved more securely from rotting in that season. The bed might also be defended, in very severe weather, with frames and glasses, or with an occasional awning of mats or sail cloth.

Blanching.—"As the transplanted crops advance to full growth, stocky and full in the heart, some should have the leaves tied up every week or fortnight, to blanch or whiten, and to render them tender, crisp, and mild-tasted. Perform this in dry days, and in winter, when the weather is dry without frost. Using strings of fresh bass, or small osier twigs, tie the leaves regularly together, a little above the middle, moderately close. If the soil be light and dry, earth them up half way; but if moist, merely tie them.

The two curled sorts, if neatly earthed up, will blanch pretty well without being tied. The Batavian, from its loftier, looser growth, in every case hearts and blanches better with a bandage. The blanching will be completed sometimes in a week, when the weather is hot and dry; at others, it may take a fortnight or three weeks; after which the endive should be taken up for use, or it will soon rot, in six days or less, especially if much rain fall. To save the trouble of tying, this esculent is also occasionally blanched by setting up flat tiles, or boards, on each side of the plants, which, resting against each other in an angular form, and confined with earth, exclude the light. Further, endive may be blanched under garden-pots or blanching-pots, in the manner of sea-kale. In the heat of summer and autumn, tying up is best; but in wet or cold weather, to cover the plants preserves while it blanches them.

Occasional shelter.—"At the approach of severe frost, cover some thickly with straw litter. Also plunge a portion into a raised bank of light, dry earth, under a glass case, or covered shed, open to the south. Protect with litter in rigorous weather; but uncover, and give plenty of air, on mild days.

To save seed.—"Allot some of the strongest old plants in February or March, if any remain; otherwise, sow seed in March or April, and transplant or thin the plants to twelve or fifteen inches distance. They will shoot, and the seed ripen in autumn.

Use.—"It is cultivated for the stocky head of leaves, which, after being blanched to take away the bitter taste, are used in salads and stews."—*Loudon.*

ESPALIERS.—Espaliers in horticulture are rows of trees, planted in gardens or hedges, and trained to rails, lattices or trellises of wood work, &c.

The trees chiefly planted for espaliers are, apples, pears, and plums. Espalier rails are substitutes for walls, and which they so far resemble, that the trees are regularly spread and trained along them, are fully exposed to the light, and, having their branches fixed, are less liable to be injured by high winds. They may be made of wood, cast iron, or wire and wood.

"An espalier has this advantage over a wall tree, that, as being wholly detached, the branches have liberty to form fruit spurs on both sides, which, in the wall tree cannot be effected but on one; in fact, common fruit walls are unnecessary in the United States, except in the Eastern

and some of the Middle States, where they are useful in forwarding, to due perfection and flavour, some late kinds of superior peaches, grapes, and other late fruits; but when walls are built for other purposes, and are conveniently situated, advantage ought to be taken of them for raising fruit; observing to suit the various kinds to the various aspects."—*M'Mahon.*

FENNEL.—*Anethum fœniculum.*—"The fennel is a perennial plant, naturalized in England, and found in chalky soils. The plant rises with finely cut leaves, and capillary leaflets, on a smooth, dark-green, branched, tubular stalk, to the height of five or six feet. On the summit are produced umbels of gold-coloured flowers, in July and August. The whole plant is aromatic, and has long been an inmate of the garden.

"*Use.*—The tender stalks of common fennel are used in salads; the leaves, boiled, enter into many fish sauces; and, raw, are garnishes for several dishes. The blanched stalks of the variety called *finochio* are eaten with oil, vinegar, and pepper, as a cold salad, and they are likewise sometimes put into soups.

"*The varieties* are—

The common, or sweet,
Dark-green-leaved,
Dwarf, or finochio. This variety is characterized by a tendency in the stalk to swell to a considerable thickness. This thickened part is blanched by earthing up, and is then very tender. 'Owing to the peculiar nature of this variety,' Neill observes, 'it is more tender than the common fennel, and often perishes in the course of the winter. Misled by this circumstance, several horticultural writers describe it as an annual species, under the appellation *A. segetum.*'

"*Propagation.*—They are all raised from seed, of which half an ounce is sufficient for a seed-bed four feet by six feet. Sometimes, also, they are raised from offsets from the old plants, where only a few are wanted. 'Sow in the spring in light earth, either in drills from six to twelve inches apart, or broad-cast and raked in. When the plants are three or four inches high, thin or transplant a quantity fifteen inches asunder. As the roots of old plants divide into side offsets, these may be slipped off in spring, summer, or autumn, and planted a foot apart. They will produce immediate leaves for present supply, and in continuance; or, for an immediate larger supply of leaves, you may procure some established full roots, and plant as above: let them be well watered.'

"*Subsequent culture.*—'The same plants remain several years by the root; but as fennel sends up strong stems for

seed in summer. these, or a part of them, should be cut down, to encourage a production of young leaves below, in succession. It is apt to spread more than is desirable, if suffered to seed. The swelling stems of the finochio variety, when of some tolerable substance, should be earthed up on each side five or six inches, to blanch them white and tender. This will be effected in ten days or a fortnight; and, by successive sowings, or cutting down plants during summer, successive crops of blanched stalks may be had from June to December.'

"*To save seed.*—'Permit some of the best stalks to shoot; they will produce large umbels of seed in autumn.'—*Abercrombie.*"—*Loudon.*

FLOWERS, ORNAMENTAL.—Should the agriculturist have no taste for ornamental gardening, yet such is the laudable taste of the fair daughters of America, at the present day, that there are but comparatively few, that do not take an interest in a flower garden. And this alone is a sufficient reason for the publication of these remarks.

Horticulture, as it respects ornamental gardening, is one of the most innocent, the most healthy, and, to some, the most pleasing employment in life. The rural scenes which it affords are instructive lessons, tending to moral and social virtue; teaching us to "look through nature up to nature's God."

Flower gardens were ever held in high estimation by persons of taste. Emperors and kings have been delighted with the expansion of flowers. "*Consider the lilies of the field,*" said an exalted personage, "*how they grow;*" for Solomon, when clothed in the purple of royalty, "*was not arrayed like one of these.*" Nature, in her gay attire, unfolds to view a vast variety, which is pleasing to the human mind; and consequently has a tendency to tranquillize the agitated passions, and exhilarate the man, nerve the imagination, and render all around him delightful.

The cultivation of flowers is an employment adapted to every grade, the high and the low, the rich and the poor; but especially to those who have retired from the busy scenes of active life. Man was never made to rust out in idleness. A degree of exercise is as necessary for the preservation of health, both of body and mind, as food. And what exercise is more fit for him, who is in the decline of life, than that of superintending a well ordered garden? What more enlivens the *sinking mind?* What more invigo-

rates the *feeble frame*? What is more conducive to a *long life*?

Floriculture is peculiarly calculated for the amusement of youth. It may teach them many important lessons. Let a piece of ground be appropriated to their use—to improve in such a manner as their inclinations shall dictate—to cultivate such plants as are pleasing to their taste; and let them receive the proceeds. Let order and neatness pervade their little plantations. Let them be instructed, that nothing valuable is to be obtained or preserved without labour, care, and attention—that as every valuable plant must be defended, and every noxious weed removed, so every moral virtue must be protected, and every corrupt passion and propensity subdued.

The cultivation of flowers is an appropriate amusement for young ladies. It teaches neatness, cultivates a correct taste, and furnishes the mind with many pleasing ideas. The delicate form and features, the mildness and sympathy of disposition, render them fit subjects to raise those transcendent beauties of nature, which declare the "perfections of the Creator's power." The splendid lustre and variegated hues (which bid defiance to the pencil) of the rose, the lily, the tulip, and a thousand others, harmonize with the fair, fostering hand that tends them—with the heart susceptible to the noblest impressions—and with spotless innocence.

Situation.—As to the proper situation for a garden, it is not always in our power to choose. A level plat, however, is to be preferred; for, if there be considerable descent, the heavy rains will wash away the soil. A southern aspect, sheltered from the north and north-west winds, is a proper situation for most plants. An inclination towards the north, or west, or any point between them, should, if possible, be avoided.

Soil.—The natural soil should be a deep loam, which is easily made rich by old, rotten manure. But here, again, it is not always in our power to choose such a soil. In such cases we must endeavour to imitate—we must dig and carry off—and bring on loam, &c. and make a rich soil. The ground ought to be well pulverized with the plough or the spade. In a word, what is wanted, is a deep, rich soil, natural or artificial, not too wet, nor too dry.

The ground in a garden must be kept rich, and often stirred. It ought to be manured every year. A compost made of decayed vegetables, yard manure, rotten leaves,

ashes, and mould from any place, where it can be had, is proper for a garden. A garden should be well defended, by a high and tight fence, especially on the north and west.

Sowing and planting.—In the first place, the ground must be made fine, as well as rich. It should be moderately moist, not too wet, nor too dry. The beds should be raised three or four inches above the level of the walks; and the seeds ought, by all means, to be sown in rows, ten or twelve inches apart; and the earth should be moderately pressed upon them. The time for sowing either annual, biennial, or perennial flower-seeds, is in the months of April and May, according to the state of the season. Very small seeds may be covered with fine earth nearly half an inch; larger ones in proportion to their size; and those as large as a pea, to the depth of an inch, or a little more. Seeds of delicate plants should be planted in flower-pots, and the earth kept moderately moist, by watering with a watering-pot, that is finely pierced, and does not pour heavily; or the pot may be placed in the pan, and water supplied at the bottom. The pots should be exposed to the sun, except from eleven, A. M., to two, P. M., when a powerful sun might scorch the vegetating seed. The mould for pots should be rich, and sifted through a coarse sieve, made for that purpose.

Transplanting.—The best time, perhaps, for transplanting annual plants is in June, and for biennial and perennial plants in September or the beginning of October, remembering, in all cases, to take a sufficient quantity of earth, with the roots, where it can be done with propriety. Scoop trowels will be found useful instruments in this operation, which ought not to be done when the ground is very wet, but when it is only moderately moist, and in a cloudy day, or a little before the evening, or previous to a shower. If the ground be dry, shading the plants, and a little water, may be necessary, for a short time. In case the roots should be small, or injured, or destitute of earth, when taken up, they must be shaded during the day, until they have gained strength. In placing a plant where it is to stand, great care is necessary to place the roots in their natural position, to bring the earth in contact with them, and to press the earth moderately about them.

If the plant is to be planted in a pot, place a piece of earthen ware over the aperture in the bottom, that the superabundant water may drain off, which would otherwise saturate and rot the roots. The pots should be nearly filled

with rich earth, and the plant carefully placed in the centre, and the mould brought into contact with the roots, and moderately pressed.

Cultivation.—The plants must be properly thinned while they are small; for, if left too near each other, they interfere, grow slender and weakly. As the plants increase in size, remove the weakest, and so continue to do, until they stand at a proper distance. All plants of every description should stand at such distance one from the other, as that the air may circulate freely about them, and that the sun may have its proper influence in bringing them to perfection. The air and sun are absolutely necessary in perfecting the growth of plants, which never ought to stand so near as to interfere with each other.

The earth ought to be kept loose about the plants, and for this purpose a prong-hoe is a useful instrument. Moving the earth should be done in dry weather; as ploughing, digging, or hoeing in wet weather, leaves the ground in a bad, clammy state. In a dry season, stir the earth about plants, and spread old coarse hay or straw about them. Old hay spread about the plants keeps the earth cool, and retains the moisture, and is very useful to vines.

Weeds of every species must be removed, and the sooner the better after their appearance. No weed should be suffered to flower in a garden, nor in its border. The beauty of a garden depends very much on order and neatness—a place for every thing, and every thing in its place—keeping out the weeds, and removing every thing when decayed. No garden can show to advantage, where weeds are permitted to usurp the place of useful plants.

Shrubbery in general requires some attention. Prune out all inferior, dead, and decaying branches. Keep down the suckers, and clean out the weeds, and stir the earth about the roots occasionally. Order and neatness add a lustre to every thing.

Cuttings are pieces, cut from trees, shrubs, or plants of the last growth, and should generally retain a small piece of the growth immediately preceding the last or ripened wood. They should be taken when the sap is active, and about six joints or buds are sufficient. Cut them with a sharp knife, transversely and smoothly, near a joint or bud of the previous growth, or between the two last growths. Set them in rich, moist ground, in a shady place, leaving two or three joints or buds above the surface. If the weather be dry, water them, and place old hay about them, to

keep the earth moist. Such parts of herbaceous plants should be taken for cuttings, as do not show a tendency to flower. If the cutting be planted in a flower-pot, place the pot in the earth, in a shady place, and cover the cutting with an inverted glass, for a short time, to preserve a moist atmosphere about it. If they send out roots, they will also send out branches, otherwise they die.

Layers are branches left on the parent plant or shrub, and bent down, and fastened several inches (according to the case) below the surface of the earth, leaving the extreme part out of the ground. A flat stone, placed on the earth immediately above the layer, is useful to keep the earth cool, and to retain the moisture. When they have taken sufficient root, sever them from the parent stock, and at any proper time they may be transplanted.

As to the cultivation of herbaceous plants and shrubs in pots, a few directions may be necessary.—The earth should be kept moderately moist. The mould on the top should be dry before additional water be given. The pots should be frequently turned round, or the plants will grow crooked by reason of their inclining towards the sun or light. If the plants are to stand in pots, year after year, the balls of earth should be taken out in October, and the sides and bottom shaved off with a sharp knife, to the depth of an inch, more or less, according to the size, and then replaced, and the pot filled with some fresh compost or very rich earth made very fine. Two thirds of good rich earth and one third of old rotten yard-manure, well incorporated, make a good compost for most plants, except the bulbous-rooted, which require some sand.

Protection during the winter.—Herbaceous plants in general require some slight covering during the severity of a northern winter. Pine boughs, straw, old coarse hay, or leaves, are useful for this purpose, and may be removed about the first of April or before, if the weather will permit.

BULBOUS FLOWER ROOTS.—No class of plants is more interesting, perhaps, than this; yet merely an outline of the mode of cultivation must suffice.

Situation.—A southern exposure, not too wet nor too dry, sheltered from the north and north-west winds, is proper for most bulbous roots.

Soil.—Bulbous flower roots do best in a soil composed of one third sand, one third old rotten yard-manure, and one third good rich earth, well pulverized and mixed together; and if a small proportion, say about one fourth, of decomposed

vegetable mould, from a wood or swamp, be added, it will have a good effect by giving additional lightness to the soil. The beds should be raised four or five inches above the level of the walks, that the superfluous moisture may run off. Some additional sand, strewed in the trenches made for the roots, before and after planting them, is recommended.

Transplanting.—The proper season for transplanting most bulbous roots, is in August, September, and October. The only advantage to be gained, by taking up bulbs, after blooming, (tulips excepted,) is either to divide the roots, when too numerous, or to renew a worn out soil, neither of which can occur oftener than once in three or four years. Tulips and hyacinths, when taken up after blooming, and after the foliage is decayed, may be kept from the ground till the middle of October.

Delicate and tender bulbs, as the Feraria tigrida, &c. may be planted in pots in November, or they may be kept in dry sand until April, (which is best,) and then planted in pots or open ground. In either case they must be secured from the frost. As to tulips and hyacinths, in order to preserve their beauty in perfection, the nicer varieties should be taken up, air-dried, and replanted annually.

Depths and distances.—Large bulbs, as the hyacinth and the large lilies, should be planted to the depth of four inches; tulips, Narcissus, jonquils, three inches; crocus, Feraria tigrida, gladiolus, &c. two inches, always measuring from the top of the bulb. The polyanthos Narcissus may be planted five or six inches deep. The rows should be ten or twelve inches asunder, and the roots placed from three to eight inches apart, according to the size of the plants.

Protection during winter.—Bulbous roots should be covered in November with tanners' bark, leaves, rubbish of the garden, or some light substance, to the depth of three inches, to prevent the bad effects of severe frosts. Polyanthos Narcissus is more tender than hyacinths, and ought to be covered six or seven inches. The covering must be removed early in the spring.

Management of bulbous roots in pots.—Hyacinths, polyanthos Narcissus, double Narcissus, and jonquils, make a beautiful appearance, during winter, in the parlour.

Bulbs intended for blooming in the winter, should be potted in October or November, and left out until it begins to freeze, and then placed in a warm room. They will want, occasionally, a little water, until they begin to grow,

then they should have both air and sun, and plenty of water from the saucers or pans, underneath the pots.

Those bulbs, as hyacinths, &c. which are designed to flower in glasses, should be placed in them towards the end of November, the glasses being first filled with rain-water, so that the bulbs may come in contact with it. Then place them in a dark place for a few days, to promote the shooting of the roots, after which expose them to the light and sun, and change the water as often as it becomes impure, not suffering it to freeze.

Bulbous-rooted plants, growing in pots, should be frequently turned round, as they will incline to the sun or light—the earth on the top should be suffered to dry, before the next watering—when the plants have done growing, give them little or no water. If the plant be so managed the present year, as not to have a flower-bud formed in miniature, there will be no flower in the next. If the leaves be well grown, and the plant properly exposed to the air and sun, then the sap will be duly prepared by them, and an embryo flower will be formed in the bulb. All bulbs, in a certain period of the year, are dormant; this state commences when the foliage begins to decay, after blooming—then lessen the supplies of water, and in a little time cease to water altogether, until the season of regermination returns. The bulbs, during this time, may be kept in the pots in a dry, shady place, and in the same temperature as that in which they delight to grow.

Generally, it is best to take the bulbs out of the pots, after the decay of the foliage, and repot them in a fresh soil or compost, (mentioned above for bulbs,) a week or two before the period of regerminating; at which time water will be necessary, and may be applied at the bottom, pouring into the pan, or it may be applied by a small watering-pot, that pours lightly, on the top, so as to keep the earth moderately moist. The earth should be kept loose on the top, and the water used for the plants ought to be rain water, or such as has been exposed to the sun. Water that has been filtered through a rich compost is very useful

The proper time to take up bulbous roots is in about month after blooming, when the foliage has a yellowish decayed appearance. Cut off the stem and foliage within an inch of the bulb, leaving the fibrous roots attached to it After they are air-dried, place them singly in paper or dry sand, until replanted, or spread them on shelves in a dry apartment.

Flowers are divided into *annuals*, which flower and die the year they are sown; *biennials*, which flower the second year, and then die; and *perennials*, which do not, generally, flower the first year, but die down to the ground annually, and spring up again every succeeding spring for a number of years.

In the following alphabetical list, flowering trees and shrubs are included. We shall select such plants, shrubs, and trees, as are of easy cultivation, generally hardy—such as have singular foliage, fragrant odours, or beautiful flowers—such as make a handsome appearance. As to placing them in the garden, or elsewhere, to advantage, we leave it to the convenience and taste of the proprietor.

ALTHÆA FRUTEX—*Hibiscus Syriacus*—is a beautiful shrub, but requires a warm, sheltered situation in the Northern States. It is easily raised from the seeds, sown in the spring. The young plants must be well protected during the winter.

ALMOND, DOUBLE-FLOWERING—*Amygdalus pumila*—is a shrub, which is, generally, in the spring, loaded with beautiful flowers, resembling small roses. When in bloom, it is not inferior to any shrub whatever, and makes a fine appearance in a border. It is propagated by suckers.

AMARANTHUS SUPERBUS—annual—superb—flowers late—tender—plant the seed in May, or before, if the season be mild.

AMARANTHUS TRICOLOR.—This plant is annual, and is admired for its beautiful foliage, red, green and yellow—tender. The seed is found in little tufts about the stalk, and should be sown in May, or before, if the weather be warm.

ANIMATED OATS—*Avena sensitiva*—are annual, and resemble the common oats, while growing. The seeds are clothed with a stiff down, and have appendages like the legs of some insect, with apparent joints. They are affected by the changes of the weather, and, of course, are continually moving. If they be wet, they will turn over several times, and twist about. If wet, and held to a lighted lamp, they exhibit such motions of apparent agony, as an insect would, placed in a like situation.

ASTER, CHINA.—It is annual, and produces many flowers, beautiful to the sight. There are many species, as red, white, purple, striped, quilled, &c. The seed should be sown early in the spring. It flowers late in the season, and endures some frost, but will not stand a severe one.

AURICULA.—This is one of the flowers, the species of

which are distinguished by having awarded to them the names of famous *men*, famous *women*, famous *cities*, famous *battles*, &c. It may be raised from seed; but the flowers so raised do not resemble those of the parent plant, except by mere accident. However, if a flower be produced different from any which has appeared before, there will be a chance to add to the list of names. Auriculas are best propagated by dividing the roots, which send out several young plants annually. They are tender, and, if planted in open ground, they must be well covered, and be kept from severe frost and rain during the winter. They are well calculated for pots, to flower in the parlour.

AZALEA NUDIFLORA.—Several species—commonly called American honeysuckle. This shrub blows profusely—very fragrant, and makes a fine appearance in a border.

BOX—*Buxus sempervirens*—is a small, delicate shrub, which may be pruned to any shape, to please the fancy. It is an evergreen, hardy, and is proper to trim beds. It appears well in a border. It is propagated by cuttings, or by dividing the roots. If a plant be placed deep in the earth, and the soil be brought in close contact with the small branches, (being spread as much as possible,) they will send out roots, and afford a great number of small plants. The small branches are used by the ladies to trim cake, &c.

BRIER, SWEET—*Rosa rubiginosa*—is a well known bush of the rose family—very hardy—foliage bright and fragrant—will grow in poor ground.

CANTERBURY BELL.—*Campanula medium*—is a biennial plant, and is admired for its profusion of large blue flowers.

CARNATION.—*Dianthus caryophyllus.*—Here is beauty and fragrance. It is a superb plant, and is biennial and perennial. There are various kinds, distinguished by names like those of the auricula, and what was said of the seed of that plant applies to this. It is best propagated by *layers*. While it is in flower, it sends out several side shoots near the root. These are pinned down in August a little under the earth, leaving the extreme part erect. In a little time they take root, and the new plant must be severed from the old and transplanted. The old plant does not always stand another winter; therefore, its branches are thus used to continue the species. Carnations are rather tender as to frost, and must be well covered, as far north as Massachusetts, to live through the winter. It is best to put them in large pots, and to keep them in a green-house, or parlour,

or in some place where they can have air and light, during the winter. They merit all the care that can be bestowed upon them.

Cassia Marylandica is a perennial plant, producing many small yellow flowers, suitable only to stand in a border. It is hardy, and is propagated by seed.

Catalpa—*Catalpa syringæfolia*—is a beautiful tree, much admired for its foliage and showy flowers. It is propagated by seed.

Cherry, double-flowering.—This is one of the most beautiful trees in the flower-garden or shrubbery; cultivation the same as that of the common cherry.

Chrysanthemum Indicum.—This is a superb perennial flower, much esteemed; being hardy, and affording a brilliant display of beauty, late in the autumn, when the chilling blasts of the north-west and frosts have only left us the vestiges of departed verdure. They may stand in open ground until August or September, and then be taken up and placed in pots. When the frosts appear, keep them in a sitting room until after flowering, which is a long time, and then the roots may be put in the cellar, or in open ground. They will flower in the garden, if properly covered with glass. There are many varieties, all of which are propagated by dividing the roots.

Clematis, Austrian—*Clematis integrifolia*—is a perennial plant, producing very neat flowers. Best propagated by dividing the roots.

Clethra—*Clethra alnifolia*—is a very common shrub, which produces fragrant flowers, in clusters, in the autumn.

Columbine.—*Aquilegia.*—Perennial—very common—very neat—many species.

Convolvulus.—Many species—annual.—Convolvulus major is commonly called *morning glory.* It is a vine, and a great runner—many colours. Convolvulus minor, called *beauty of the night*, because it blossoms at evening—many colours. They are much admired. The seed must be sown early in the spring.

Corchorus Japonicus.—This shrub, although cultivated as a green-house plant, will thrive in a warm, sheltered place in a garden. It produces numerous flowers of a golden yellow, in wreaths, much admired.

Crocus.—A bulbous-rooted plant—hardy—very early—various colours; as blue, white, purple, yellow, &c. Appears to advantage in small pots. Propagated by the bulbs.

Cupid's car, *or* Monk's hood—*Aconitum napellas*—is a

beautiful, hardy perennial. It produces many neat, blue flowers, both in summer and autumn. It is propagated by dividing the roots.

DAHLIA.—This is a beautiful autumnal flowering plant, a native of Mexico. There are many varieties, single and double, and of almost every colour and shade. Dahlias will grow in almost any soil, but a poor, sandy, or gravelly soil is thought best, for the purpose of preventing them from growing too luxuriant, which would be the case if planted in a rich soil. In a poor soil they produce a greater abundance of flowers. They are propagated by seed and by dividing the roots.

The seed may be sown in March, in pots, and placed in a hot-bed, or green-house. About the middle of May, or when there is no danger from frost, plant them out in the borders, or wherever they are to stand, and, as they advance in height, let them be well supported by stakes, otherwise the wind will break them down.

The roots are tuberous, resembling a sweet potato, and should be taken up in October or November, and preserved through the winter in a box filled with dry sand, placed where the frost never penetrates. Towards the end of April, or when they begin to sprout, divide the roots, and plant them where they are to stand, taking care to cover them in case of frost. Plant only those that have a bud, and be careful that it is not hurt by dividing the roots. The plants soon shoot up to considerable height, and produce a great abundance of flowers. The plants must be well supported by slender stakes. They are said to do well if planted in large pots.

DAISY—*Bellis*—is a small, delicate, perennial plant, and produces beautiful little flowers. It is hardy, and well calculated for pots, placed in the sitting room; in which case they will flower in the winter. It is propagated by offsets.

DWARF BASIL—*Ocymum minimum*—is a sweet, fragrant, annual plant, easily raised by seed. But few plants exceed this in fragrance.

EGG PLANT.—This is a singular, annual plant. The white *(Solanum melongena)* is the most unique, producing a fruit resembling a large white egg. The seed should be planted early, in a hot-bed, and after the frosts have gone past, transplant them where it is desired they should stand.

EUPATORIUM, BLUE—*Eupatorium cœlestinum*—is a peren-

nial plant, producing many beautiful flowers, much admired. Propagated best by dividing the roots.

EUPHORBIA LATHYRIS—is a biennial plant, commonly called the caper-tree. It is singular in its foliage, and bears a small fruit useful for pickling. It is rather tender, but will stand the winter very well in a common hot-bed. It is raised from seed.

FADING BEAUTY, *or* MORNING BRIDE—*Scabiosa atropurpurea*—is an annual plant, producing beautiful flowers; but they soon fade, continuing only an hour or two. The seed should be planted early in the spring.

FIR—*Pinus balsamea*—is not a flowering tree, but it is a beautiful evergreen, and very ornamental.

FOXGLOVE—*Digitalis*—is a biennial and perennial plant, and produces very handsome flowers. There are several species, but the purple is the most beautiful. The seed is very small, and ought to be sown early in the spring, and very lightly covered with earth. The plant possesses high medicinal virtues.

FRINGE-TREE—*Chionanthes*—a beautiful American shrub, covered with white flowers in its season. It is hardy, and will grow in any soil, but flourishes best in moist ground.

GERANIUM.—*Pelargonium.*—This plant wants hardiness only to make it one of the finest and most valuable productions in the floral kingdom. There are many varieties. Some give us flower with little or no leaf; others possess beauty of leaf, as well as of flower; some give us no fragrance; but others give us the most delightful odours, and in great profusion. The geranium is a native of the south of Africa, and will not endure the frost. It is easily propagated by cuttings from any part of the plant, old wood or young, and placed in a pot. In a green-house, they will bloom throughout a northern winter. They are, properly, green-house plants. There is one, however, which is as hardy as an oak tree, *geranium maculatum*, producing a blue flower. It is possessed of great medicinal powers.

GARDEN ANGELICA—*Angelica archangelica*—has a bold appearance when in flower. It is suitable for a border, and very showy. It is propagated by seed. It is a perennial

GLYCINE, CLUSTER-FLOWERING—*Glycine frutescens*—is a perennial vine, and will extend on the side of a house or wall to great length. It is much admired. The flowers are variegated. Propagated by seed and from layers.

GOLDEN COREOPSIS.—*Coreopsis elegans.*—This is an annual plant, and produces a profusion of splendid flowers of

a brilliant yellow, with rich purple centre. It is easily raised from the seed.

GOLDEN EVERLASTING—*Xeranthemum lucidum*—is a very singular plant, and produces bright yellow flowers, which, if plucked before the seed ripens, will hold their brightness for years. It is much admired. The seed should be planted early, as the plant will flower late in the season.

HOLLYHOCK.—*Althæa.*—This is a showy plant for a shrubbery. It is hardy and perennial There are various kinds; single and double, white, red, yellow, black, and variegated.

HONEYSUCKLE.—This plant is very beautiful in its place; it climbs up houses, and over hedges: it forms arbours and bowers: it blooms in clusters. Three varieties we shall name. The *Italian* (*Lonicera Italica*) produces an abundance of flowers early in the season, diffusing a rich fragrance all around. The flowers are changeable. The *variegated* (*Lonicera caprifolium*) blooms monthly, and has a delightful fragrance. The *scarlet trumpet* (*Caprifolium sempervirens*) blooms monthly,—scarlet flowers,—and makes a beautiful appearance. They may be propagated by seed or cuttings, but best by layers.

HYACINTH.—*Hyacinthus orientalis.*—This is a bulbous-rooted plant, and, like all other plants of this class, is perennial. It is a beautiful and fragrant flower; it blooms early It will bloom in glasses filled with water in a room, but better in pots of earth. It is best propagated by offsets. While the parent root is blowing, it sends out several young ones. They should be planted at the depth of four inches. There are many varieties of this favourite flower, both single and double; the former have the most vivid colours, but the latter are generally preferred. Such was the rage in Holland for this superb flower, that, in the year 1771, four thousand dollars were refused for a single bulb.

HYDRANGEA—*Hydrangea hortensis*—is a small shrub, and produces very large flowers, which are changeable. The flowers are at first green—change gradually to rose-colour—then to green—occupying the space of about six months. It is a house-plant; will bear some frost; but must be kept during the winter in a green-house, sitting-room, or cellar, into which some light is admitted. This ornamental shrub is easily propagated by cuttings.

ICE-PLANT—*Mesembryantheum crystallinum*—is an annual plant, and has an icy appearance. It is singular. The seed should be planted in pots early in the spring.

IMPATIENS BALSAMINA.—A very fine annual plant, with great abundance of showy flowers. There are several varieties, both single and double, rose-coloured, red, purple, pure white, variegated and crimson. The flowers are elegantly formed, and the colours of many are very vivid. The plant is commonly called *balsamine*. It will bloom in July, and continue in flower until the frost appears. The seed should be sown in May.

IRIS, *or* FLEUR DE LUCE.—This is a perennial plant, perfectly hardy. There are many varieties, both large and small. From its great combination of colours, and unique appearance, it has ever had admirers. It shows to advantage in a border. It is propagated by dividing the roots.

LAGENTRŒNIA INDICA.—A flowering shrub, which endures the winter of the Middle and Southern States. In Massachusetts, it must be treated like the hydrangea, but its beauty will repay this attention.

LAUREL, BROAD-LEAVED—*Kalmia latifolia*—is an evergreen shrub, which produces flowers of great delicacy and beauty, being white, tinged with red. This ornamental shrub is occasionally found in rocky woodlands.

LABURNUM—*Cytisus laburnum*—is a tall and handsome shrub, loaded, when in bloom, with yellow flowers. It is sometimes called *golden chain*. It is tender, and to stand a Massachusetts winter must be planted in a warm and sheltered situation. It is raised from the seed.

LARKSPUR—*Delphinium*—is an annual plant of no fragrance, but of great variety of colours. It makes a good appearance, and is easily propagated from the seed.

LILAC.—*Syringa vulgaris*.—This is a large shrub, very hardy, and much admired when in bloom. It has large bunches of flowers, which possess considerable fragrance. The white and the purple may be easily grafted, or innoculated into each other, and when the shrub, with a handsome head, is thus managed, some branches producing purple, and others white flowers, it makes a beautiful appearance. It is propagated from suckers, of which it sends out too many, and from which it should be kept as clear as possible. The Persian lilac (*Syringa Persica*) is a neat shrub, loaded, when in bloom, with very delicate flowers. It is propagated by suckers.

LILY.—*Lilium*.—Of this plant there is a great variety; but only a few shall be named.—The white (*Lilium candidum*) grows to the height of three or four feet, and produces very large, white, fragrant flowers. The Tiger (*Lilium*

tigrinum) grows to the height of from four to six feet, and produces many spotted flowers of a bold appearance. The *Martagon* is much like the latter, except the plant and flowers are more delicate. All these are bulbous-rooted, and are best propagated from offsets. The asphodel (*Lilium luteum*) grows to the height of two feet, and produces beautiful yellow flowers. It is propagated by seed or offsets. All the above-named lilies are well calculated to beautify a border. The lily of the valley (*Convallaria majalis*) is a small dwarf plant, that thrives best in the shade, where it produces little delicate flowers of exquisite fragrance. Propagated by offsets.

LIME-PLANT.—This plant (*Podophyllum peltatum*) is a singular production of nature. The stem, foliage, flower, and fruit, are formed in the earth; and, after the plant has come up, there is nothing more than the extension of parts. The stems, at the height of from eight to twelve inches, branch out in two arms; at the extremity of each is a large palmated leaf. In the fork proceeds the fruit stem. The first that is seen in the spring is a delicate membraneous cap, which is soon burst open by the flower-bud, which is large, white, and round. The shoulders and arms, lying close to the stem or trunk, soon appear, and, as the plant rises, the fruit stem elongates, and the arms elevate themselves. The fruit is about the size of a large lime, green while growing, and yellow when ripe; has the flavour of a pine-apple; and, as to eating, is but little inferior to that fruit. The plant requires a moist soil in a shady situation—may be propagated by seed, but best by dividing the roots, which are creeping and jointed. The root is medicinal.

LYCHNADIA—*Phlox*—is a perennial—several varieties; as purple, white, striped, &c. The plant is hardy, and produces many delicate flowers, and is long in bloom. It is best propagated by dividing the roots.

MEZEREON—*Daphne mezereum*—is a small, beautiful shrub, blooming in the month of March, loaded with flowers of delightful fragrance. It is hardy as a shrub oak, and is propagated from the seed. It produces a red fruit, which is poisonous.

MOUNTAIN ASH—*Sorbus aucuparia*—is a very ornamental tree, admired for the beauty of its foliage, and its clusters of scarlet fruit, which remain on it for months. It is propagated from the seed.

MUSK GERANIUM—*Geranium moschatum*—is an annual plant, and is admired only for its strong flavour of musk.

The plant will stand the winter in a common hot-bed, and in this case may be considered biennial. The seed must be planted early.

MYRTLE, EVERGREEN—*Vinca minor*—is an evergreen vine, producing blue flowers. There are several species, and all neat and pretty in their place.

NARCISSUS—a bulbous-rooted plant, managed precisely like the hyacinth. It blooms early, is very beautiful, and is fragrant. This plant is hardy, and well calculated to bloom in a pot, in the green-house, or in a parlour. It is propagated by bulbous offsets, which increase every year. Polyanthos Narcissus and jonquils, both elegant flowering plants, are propagated and cultivated, in all respects, in the same manner.

NASTURTIUM—an annual plant, with showy flowers. The seeds are enveloped in fleshy pods, which, before they become ripe, are excellent for pickling. The seed should be sown very early in the spring. The plants should be supported from the ground by bushy sticks.

PASSION-FLOWER—*Passiflora*—is a perennial vine, which produces a very beautiful flower. The name originated from the large *cross* in the middle of the flower, surrounded by appendages resembling a *glory*. The plant is also beautiful; and, like the honeysuckle, has a succession of flowers for a long time. It is tender, and suitable for the green-house. It will not endure a northern winter in open ground. It is best raised from cuttings.

PÆONY—*Pæonia*—is a perennial, that has a very grand flower, but of short duration. There are several species much admired. Propagated from offsets.

PEA, SWEET.—*Lathyrus odoratus*.—There are many species as to colour and fragrance. These are annual. The everlasting pea (*Lathyrus latifolius*) is perennial, and produces many clusters of showy flowers, and remains in bloom a long time. The seed should be planted early in the spring.

PEACH, DOUBLE-FLOWERING.—This is a very showy tree; its flowers are as double and as large as the smaller sorts of roses—hardy, and treated like other peach-trees.

PINK—*Dianthus*—is a perennial plant, too well known to be described here. There are many kinds, as to size and colour, but all are fragrant. They are desirable articles for a flower-garden, and are easily propagated by seed, by layers, and by dividing the roots.

PERENNIAL SUNFLOWER, DOUBLE—*Helianthus multiflorus*

—is a fine plant to beautify a border—propagated by seed, or by dividing the roots.

Polyanthos.—This perennial plant (*Primula polyanthos*) is hardy, has many showy flowers, and is much esteemed. There are many varieties. The plant blooms best in a shady situation. It is best propagated by dividing the roots. Polyanthos Narcissus is a very pretty perennial, well calculated to bloom in a parlour. It is bulbous-rooted, and easily propagated by offsets.

Pyrethrum Parthenium, commonly called double feverfew, is a hardy perennial, and produces an abundance of white flowers, and continues in bloom a long time. It is easily propagated by the seed.

Poppy—*Papaver*—is an annual plant, admired for its great variety in size and in flower. The double are very showy, but, like beauty, soon fade. It is a medicinal plant, and easily cultivated.

Purple hyacinth bean—*Dolichos*—is an annual runner, producing large clusters of purple flowers, much admired. The seed should be planted early, and the plants defended from the frost.

Rose.—*Rosa.*—This favourite flower is worthy of all the care and attention that can be paid to it. There are many varieties, as to size, singularity, foliage, beauty, and fragrance. Some catalogues enumerate more than five hundred varieties. Messrs. G. Thorburn & Son have a splendid collection in their green-house, Liberty Street, New York. No class of plants yields more intrinsic delights than this. It is unrivalled. To describe the beauties and excellence of the various species would fill a volume.

They may be propagated from seed, but, as the seed seldom comes up till the second year, the usual mode of propagation is by suckers, which come out near the old stems, during the summer. The suckers, when planted out, should be cut down to four or five inches of the ground. The time for planting is either in the months of October and November, or in April. As to the management, the ground should be kept good, and dug every autumn. They should, except when trained against a wall, be kept cut down to a certain height, according to their natural size; for when they get long stems and limbs, they produce fewer flowers. All the weak, dead or dying wood should be pruned out close, without leaving any ugly stubs. "The yellow rose requires an airy situation and a gravelly soil,

and that, every autumn, one half of the old wood should be cut down within four inches of the ground; by this means a succession of thrifty, blooming shoots will be kept up.

The Chinese monthly roses are propagated by cuttings, taken in the spring, and properly placed in moist earth. These are generally tender, and require to be taken into a green-house or parlour during the winter. There are some, however, that are very hardy, and bid defiance to the frost. The writer of this article has a Chinese pale-red, monthly rose, which has stood out for several years, being only covered with a box, during the severity of the winter. It is now February 28, 1828, and the foliage is yet bright, although it has been frozen many times, during the present winter. The thermometer, however, has not been lower, the present season, than one degree above zero."

Rose acacia—*Robinia hispida*—is a singular shrub, producing many clusters of flowers, much admired. Propagated by shoots from the roots.

Rose-coloured hibiscus—*Hibiscus palustris*—is a perennial plant, producing very showy flowers—makes a good appearance in a border. Easily propagated from the seed.

Rudbeckia—a perennial plant, producing many flowers, which are very durable and much admired. Propagated best by dividing the roots.

Scarlet cacalia—*Cacalia coccinea*—is a small annual plant, which produces numerous scarlet flowers, very showy. Easily raised from the seed.

Scarlet lychnis—*Lychnis chalcedonica*—is a perennial plant. There are two varieties, the single and the double. The single is pretty, but the double is splendid. The former is propagated from seed, and the latter by dividing the roots.

Siberian crab.—This is a small tree, esteemed for its large, fragrant flowers, and for its small fruit. The *Pyrus prunifolia* produces a beautiful longish fruit. The *Pyrus baccata*, or cherry crab, bears a beautiful round fruit. The *Pyrus spectabilis*, or Chinese double blossom, has the most beautiful flowers of the family. They are all delicate in form and flower.

Snow-ball tree—*Virburnum opulus*—is a beautiful shrub, especially when in bloom. It is propagated by suckers.

Snowberry—*Symphoria racemosa*—is a small shrub,

which produces clusters of white fruit in autumn, and is ornamental. Propagated best by suckers.

Spice-wood—*Laurus benzoin*—is a very fragrant shrub, of medicinal virtues. It grows best in the shade, and sometimes bears a long, green, spicy fruit. It is propagated by suckers.

Spiderwort—*Tradescantia*—is a singular perennial plant, which is in bloom for a long time. The blue is more admired than the white. It requires a light covering during the severity of winter; and is propagated by dividing the roots.

Spiræa.—This is a small shrub, loaded with delicate flowers in the season of its blooming. Propagated by suckers.

Syringa, *or* Mock orange.—A shrub, which has flowers much like those of the orange. It makes a pretty appearance with other shrubbery. Propagated by suckers.

Strawberry tree—*Euonymus*—is a very handsome shrub, producing, in autumn, an abundance of fruit, somewhat resembling the strawberry. The European is preferred to the American. It has been called the *burning bush*, from its appearance when loaded with ripe fruit. It is propagated by seed and by suckers.

Sweet bay—*Laurus nobilis*—is a very pretty evergreen shrub, well calculated to stand (in a large pot) in the parlour during winter. Propagated by suckers.

Sweet William, *or* Poetic pink—*Dianthus barbatus*—is an imperfect perennial, producing very handsome flowers of small size. It is propagated by seed, the plants of which do not produce flowers like those of the parent plant, except by chance. It may be propagated by dividing the roots.

Tulip.—*Tulipa.*—In no family of plants has Nature so varied her delicate tints as in this. There are more than six hundred varieties of this splendid flower cultivated in the Linnæan Garden on Long Island. During the tulip fever, which raged in Holland, about the middle of the seventeenth century, some splendid varieties were sold for enormous sums of money; one of which, called the *viceroi*, brought ten thousand dollars.

The tulip may be raised from seed; but it is, as in the case of the auricula, mere chance if one be obtained, that will produce flowers like those of the parent plant. They are best propagated by the bulbs.

There is something respecting this plant astonishing

After flowering, the foliage and roots decay, and a bulb or bulbs are formed of the juices of the old plant. A bulb contains all the parts of the future plant, and soon becomes as much disengaged from the decayed parent plant, as the ripe acorn is disengaged from its parent tree. At this time, they may be carried (like many other bulbs) any length of distance in dry moss or dry sand. They should be planted out, about three inches below the surface, in a rich soil, in August or September; after which they throw out roots, and prepare for an early appearance in the ensuing spring. If the bulbs be kept through the winter, and planted in the spring, they do not thrive that season. The nice varieties should be taken up after the decay of the old plants, every year, air-dried, and kept until September or October, and then planted.

VENITIAN SUMACH, *or* FRINGE TREE—*Rhus cotinus*—is a very singular and beautiful tree, which is loaded "during summer with tufts of russet-coloured down, and forms the most singular ornament of the garden." It has been called the *smoke tree*. Propagated by layers and by suckers.

VIOLET, BLUE, FRAGRANT.—This little plant (*Viola odorata*) is perennial; the flowers blue, double and fragrant. It blooms early in the season, and continues in flower for some time. "It is of considerable use in chymical inquiries, to detect an acid or an alkali; the former changing the blue colour to a red, and the latter to a green." It is best propagated by dividing the roots, which spread very much.

FRUITS.—The following was written for this work, at the request of the compiler, by a distinguished member of the Massachusetts Agricultural Society:—

Under the titles of each species of fruits, we have treated of their culture, and general character: this article will be devoted, exclusively, to the selection of the most approved sorts of each species of fruits. Nothing can be more annoying, nothing more embarrassing to those, who are desirous of making valuable collections of fruit-trees, without any previous personal experience, than the interminable lists, and the indiscriminate praise bestowed by nursery men. We blame them not—it is their business and their profit—the greater the variety of new names, the greater the sale. Yet it is true, that of the 150 varieties of apples, and the equally great number of pears—of the vast collections of peaches and cherries, there are but a few which are of superior quality, and these few,

judiciously selected. will amply suffice for all the wants of private families. For the market-gardener in the vicinity of great cities, a more ample list may be of great use and profit. So, also, the amateur of great fortune may be desirous, as a matter of curiosity, of having in his possession every known variety. Yet he will acknowledge, after all, that, if he cannot sell them, seven eighths of the whole number will perish, because better fruits are in eating at the same time. How few apples and pears can be disposed of by a private family during the period when the peaches are in perfection! The famous Duhamel, the greatest cultivator and writer on fruit-trees in any country or age, after devoting two quarto volumes in describing all the fruits of France known in his day, terminates by giving a list of forty or fifty sorts which would suffice for the luxury of any private man. It is our purpose to make a selection, we will not say of the *best*,—for as the tastes of men differ, it would be arrogant to say this,—but of what we esteem the best, and which are most generally esteemed, adding something of the qualities of each. We shall introduce them in the order of ripening.

Apples.—*Juneting* or *Jenneting*.—This is the earliest apple of our country, and is very pleasant and valuable for its quality of early ripening. It is fit for apple-sauce on the 20th of June, and for eating early in July.

Early summer pearmain.—This is said to be one of the finest summer apples; is of a reddish colour, fit for the table and for cooking; it has the desirable quality of flourishing in light and sandy soils; ripens the first of August.

The *codling*.—This is a favourite apple in England for pies and stewing; is fit for this use in August, and lasts till October.

Siberian crab.—This apple is remarkable for its beauty. It makes a beautiful preserve, to be used in winter. One small tree will suffice for a family. It is ripe in August, and should be preserved before it becomes mealy.

Monstrous pippin.—This is an enormous apple, of transient duration, but of good flavour. One tree would suffice It is a small bearer, but as a cooking apple it is valuable, ripens in October.

Pomme d'api, or *lady apple*.—This is a beautiful little apple; a constant bearer; an ornament to the dessert, from November to April. It is pleasant to the taste, but its principal value is its ornament to the table. One tree will suffice.

Doctor apple.—It is a large and handsome fruit, highly esteemed; ripens in October, and keeps for some months.

Bell-flower.—This apple we can decidedly recommend, from twenty years' trial. It is a great bearer—beautiful bright yellow: it is fit for cooking and for the table; ripens in November, and will keep till March. Its skin is so tender, that it must be gathered with great care, and put up with equal tenderness. It is the most popular apple in Philadelphia, and would be so here, if its merits, and its careful management in putting it up, were generally known. It is a vigorous and healthy tree.

Ribstone pippin.—This is a celebrated English apple, of fine flavour, and some beauty. It will keep from November to February. It has the pippin texture, is rather a shy bearer, and ought not to be cultivated extensively: but one or two trees would reward the cultivator.

The two *Spitzenbergs*—the *Newton* and *Esopus.*—These are American fruits, of the very finest quality, keeping sound, and retaining their flavour till May, from December. They bear *every year*, though, like all others of this class, they have their full and their scanty years of bearing. It is however admitted, that they are declining, not in goodness, but in fertility. On new lands they may do well for fifty years more.

The *Baldwin apple*, formerly called the *Pecker apple.*—This is probably a Massachusetts production, originating in the county of Middlesex. It is now in its prime; a healthy tree; an enormous bearer; bearing every other year, and in the intermediate one not producing an apple; for beauty, richness, and other fine qualities, not yielding to any apple in the world, except the American apple called the Newtown pippin. It is in eating from December to the first of April.

The *Newtown pippin.*—This is a New Jersey production; the finest apple in our country. It flourishes with us, but its fruit is not so fine as those grown in New Jersey. In some situations it however succeeds almost as well as in New Jersey, and is well worthy of a place in every garden, as its fruit will keep till May.

The *Roxbury russeting.*—This is a standard natural fruit of Massachusetts. Every other year it is a great bearer. Its fruit is pleasant for the table from January to July, if kept in a cold place. We add nothing further in favour of the Roxbury russeting, because its great merits for our

climate are well known. We can find no reason to believe that it was ever known in any other country.

Rhode Island greening.—This, too, seems to be a Yankee production, and a most valuable tree it is. It bears in alternate years. It is too great a bearer. The tree is inclined to bend down, and bear low. This fault should be corrected. It is principally valuable as a cooking apple, in which respect it is superior to any other. For the table it is good only when better fruit cannot be had.

Gardner's sweeting.—This is the most valuable of all the apples for baking. It bears in alternate years. It will keep till April, but it is prone to rot.

There are a great variety of sweet apples for summer and winter use, and many fine varieties of winter apples, which we have omitted. Every one knows the *nonesuch*, and the *pearmain*, superior to almost any in our list, but both appear to us to be on the decline, though we recommend their culture, on a small scale, to all who have extent of ground · our object being simply to select for small cultivators the most approved varieties. Coxe, of New Jersey, the earliest and most extensive cultivator on a great scale, has recommended the following selection of apples; and in his judgment we place great reliance:—

Juneting, ripens in	June and July.	Wine, ripens in	November.
Prince's harvest,	July.	Late pearmain,	do.
Rough apple,	do.	Bell-flower.	
Early pearmain,	August.	Newark pippin.	
Summer rose,	do.	Pennock.	
Codling,	September.	Michael Henry,	November.
Maiden's blush,	do.	Spitzenberg.	
Hagloe's crab,	do.	Newtown pippin.	
Catline,	do.	Priesley.	
Rambo,	October.	Pomme d'api.	
Fall pippin,	do.	Carhouse.	
Doctor apple,	do.		

We think our own selection preferable for these Northern States.

PEARS.—*Petit Muscat.*—To those who wish to have the earliest possible ripe pear, this insignificant but premature pear may be desirable.

Rouselet hatif.—This pear is beautiful, and highly flavoured, and one small tree is all that any cultivator would desire. We know it by the name of Catherine, or, as it is pronounced, *Kattern.*

Madeleine, or *green chissell.*—This is a fine summer pear.

Skinless pear, or *blanquette à longue queue*, is a delicious, but short-lived pear.

Epargne is a pleasant pear.

Red bergamot is a beautiful pear of the flavour of the bergamots.

The *real Jargonelle* is one of the finest summer pears. It is a great and constant bearer, and comes in between the smaller fruits of the garden, the strawberry and raspberry, and the peach. As seen in Boston market, it is a caricature of the fruit raised by the cultivator for his own use. It is gathered unripe, and artificially ripened by being put up in great masses.

The *summer good Christian* is a luscious and juicy pear, but it is scarcely possible to raise it in the country, being subject to spots and cracks.

Salviati, ripening early in August, is a delicious pear in good soils: in poor land it is of no value.

Broca's bergamot is one of the finest pears grown in sheltered situations; but in exposed ones, its leaves fall, and its fruit is acid.

The *grey beurré*, the prince of pears in Boston, and in the sheltered gardens of France, is of no value in the country, unless on walls, or in gardens sheltered by walls or hills.

Seckle pear.—This is the greatest acquisition yet made to the list of pears for New England culture. It is hardy, bears every year, is subject to no casualty, and its flavour, to most persons, is the finest of any pear yet known. It lasts about six weeks, from Sept. 15th to Nov. 1st. It is supposed to be a native. No man should be without three or four of them.

Moor-fowl egg.—This pear ripens in November; is delicious, though of a peculiar flavour.

There is a variety of this pear, which is striped, in the garden of John C. Gray, Esq., at Cambridge.

The *St. Michael's pear*, by the French called *Doyennè.*—This pear was, till lately, the pride of our gardens. Beautiful beyond any other pear, melting, and extremely sweet, it bore the palm of all autumnal pears. Causes unknown have, for ten successive years, blighted its fruit; yet we advise the continued culture of it, because we have seen the peach, after fifteen years of failure, resume its wonted fertility and vigour.

Messire Jean.—This is an admirable pear; hardy, prolific, of a breaking texture, extremely sweet, and ripening in November and December. It seems to us to be rather on the decline, but, in new gardens, it may revive.

The *Amory*, or *Gibson*, or *Andrews pear.*—These various

names are only given because we are ignorant of the real name. It is a European pear, unquestionably, and the new names are only given to the same tree, because the *same identical tree* has had, in the *same* garden, three successive owners.

It is a very fine, but transient pear, of beautiful form, and excellent qualities, ripening in September, which lessens its value.

The *Bergamotte Cressanne.*—This pear, in perfection, though rather austere, has all the high flavour of the *bergamot* family; but it is more apt to crack than any other pear whatever. The writer of this article, after twenty years' trial, has been compelled to regraft them all. It will not suit the country, unless sheltered.

The *Virgalouse.*—This, one of the finest pears of France, is subject to the same evil as the foregoing, and we solemnly warn the cultivators in the country not to try it unless they have terraces or walls.

The *Colmar.*—The same remarks will apply to this pear also. We speak from long experience, and from the experience of other eminent cultivators. We must not listen to French or American writers. This pear is not suited, with us, but to the city, or to the opulent cultivators, who make an artificial shelter for their trees either by walls, or buildings, or terraces.

The *St. Germain.*—This most noble variety of the pear family succeeded as well in the country as in town during the first twenty years of our knowledge of it, but it has failed during nearly fifteen years. It has seemed to be recovering, and we should advise the continued culture of it for a few years longer, as it is superior to any pear except the following.

The *Ambrette.*—This pear was introduced into this state in 1812. Mr. Coxe, who sent it here, called it the *Ambrette.* It is an ordinary pear in its appearance; a strong, vigorous, great-bearing tree. Not knowing its character, it was first eaten as soon as it was soft; but accident obliging us to keep it longer, it proved to be one of the best winter pears grown in our climate. It has high praise in France. Its merit with us, however, is, that it bears our climate perfectly. One small tree, imported in 1812, bore five barrels of fruit in 1816.

Of the baking pears there are many varieties:—

The *pound pear* is a great bearer, and makes a valuable baking and stewing pear.

The *iron pear*, so called in this vicinity, is nearly as valuable, as the fruit is now sound in the month of April.

The *Catillac* is also valuable from the same qualities, and is much more beautiful.

The *Spanish good Christian* is also a great bearer, and fitted for the same purposes.

We may now add the valuable varieties of pears sent to this country by Mr. Knight, with many more introduced by that indefatigable and most successful cultivator of fruits in New England, Samuel G. Perkins, Esq. of Brookline, to whom our northern horticulture is deeply indebted for his liberal dissemination of his new and valuable varieties.

Mr. Knight's trees are all of them *entirely new*, not, as has been supposed, *produced* by him, but principally by Mr. Van Mons, of the Netherlands. The new kinds, thus introduced, are as follows:—

Cassiomont.—This pear has borne fruit. It ripens in September—is of a fair size, beautiful to the eye, and delicious to the taste; well adapted to supply the place of the *St. Michael's*, should it fail us.

Napoleon, said to ripen in October, is described as a fine fruit—has not borne in this country.

Marie Louise is equally recommended—ripening in October—is showing abundance of fruit the present year.

Buerre Knox showed its fruit in 1826—a beautiful and large pear, of buttery texture, ripening in October—is also in fruit this year.

Tillington—praised as a beautiful fruit—not in bearing.

Passe Colmar—a late fruit—not in bearing.

Colmar d'hyver—a late fruit—not in bearing.

Harden pont de Printems—showing fruit this year, and presumed to be the best fruit of the pear kind for our climate—ripening in April and May.

Poire d'Aremberg—also represented as an excellent pear. Mr. Perkins has also received many other new varieties, among which we recollect the *Charles d'Autriche* and the *Sylvanche*.

The only object in introducing into this list these new varieties, is to say, that though we have distributed several thousand scions and buds, and although we have been robbed of many more, yet we have so many flourishing shoots, that we shall be able to furnish as many buds the ensuing season, and grafts the season following, as we have ever

been able to do, having kept the trees in a bush state, to encourage the growth of shoots for cultivation.

PEACHES.—This class of fruits is so natural to our country, that a great variety, unknown to European cultivators, are found, of very considerable merit. We shall therefore take notice of the varieties only more particularly distinguished.

The two varieties of nutmeg peaches have no merit whatever, except their great precocity. The earliest peach of any value is the *early Anne*, a white and very tolerable peach.

The white Magdalen,	The red Magdalen,
The royal Kensington,	The admirable,
The alberge,	The old Newington,
The swatsh,	The teton de Venus,
The noblesse,	Jaques' rareripe.

These we can recommend as excellent fruits. There are many others of excellent quality, both foreign and native; but these will suffice for a moderate-sized garden.

There are a great variety of native peaches, the value of which is often as great as that of any peaches which have names, particularly of those which have a yellow flesh. The yellow-fleshed peaches are more apt to propagate their like from the stone than any other peaches.

The *nectarine*.—Though this fruit is nothing but a smooth peach, yet it is far more tender, and requires either a wall, or a fence, or the side of some building, to protect it. The varieties are not numerous. The best are,

The Elruge; ripens in August.	fleshed; ripens in September.
The white; a beautiful fruit;—September.	Late Newington; rich and melting; September.
Lewis's nectarine, a Boston production; beautiful; yellow-	Red Roman; a beautiful and highly flavoured variety.

There are seven or eight others, but these we recommend.

The *apricot*.—This requires some shelter also; should be planted in a yard, or on the south side of a building; if nailed to it as an espalier, the better. The best are,

The Breda, | The Brussels, | The Moor park, | The peach apricot.

CHERRY.—The varieties are innumerable. For small gardens we recommend

The May duke, for its earliness,	The black Tartarean,
The common white-heart;	The red mazard new variety, called
The bigaron, or late white-heart,	the Downer cherry.
The early and the late black-heart,	

Mr Knight's new sorts are not yet tested here.

For pies and puddings, as well as for lateness, every garden should have a Morello, which is very juicy, though very acid.

PLUM.—The best plum known is the green gage, which the French call Reine Claude. Others of esteemed value are the

Violet,	Coe's golden drop,
Orleans,	Red imperial,
Fotheringham,	White imperial,
Drop d'or,	La royale.

BERRIES.—The English garden *mulberry* is a highly esteemed fruit, but it is apt to be winter-killed in our climate, unless in sheltered spots.

Gooseberry.—This is a fine fruit, as brought to perfection in Great Britain. The varieties are almost infinite. The gardeners have given names to several hundred. The only direction should be to send the best Lancashire or Scotch gooseberries, of various colours. They are white, green, yellow, red, and dark purple. Some of the smaller sorts are better flavoured than any of the larger kinds.

Currant.—There are but three sorts worth cultivation—the large Dutch white; the large Dutch red; and the Champaigne, or pink-coloured, as a variety.

Raspberry.—There are only two sorts of any great value—the white Antwerp, and the red Antwerp. The cane, or smooth-stalked, is also praised by some persons, but we have had no success with it; it seems to us to be our native raspberry.

Strawberry.—For the chief crop, the red and white Alpine are the most prolific: for show and flavour, the pine-apple, the roseberry, the scarlet or Virginia, and Knight's Downton, seem to us to include all that need be desired. Mr. Parmentier, of Long Island, has introduced a sort without runners, which are said to bear twice. We have not seen them, though they are growing here.

GARLICK.—*Allium sativum.*—Garlic is a hardy, perennial plant, with a bulbous root, which grows naturally in Sicily and the south of France. The leaves are linear, long and narrow. The bulb is composed of a dozen or fifteen subordinate bulbs, called cloves.

Culture.—Garlic is propagated by planting the cloves, or subdivisions of the bulbs, and prefers a "light, dry soil, rich, but not recently dunged. In February, March, or beginning of April, having some large, full bulbs, divide them into separate cloves, and plant them singly in beds, in rows

lengthwise. Set them from six to nine inches asunder, two or three inches deep, either in drills or in holes made with a blunt-ended dibble. In placing the cloves in drills, thrust the bottom a little into the ground, and earth them over the proper depth."—*Loudon.*

M'Mahon says, garlic, rocambole and shallots, may be planted in October or November, and observes, that, "when planted at this season in dry, light, rich ground, the roots will be much larger than if deferred till spring."

Taking the crop.—"The maturity of the bulbs is discoverable by the leaves changing yellowish, in a decaying state; when they may be taken wholly up. Continue the stalky part of the leaves to each root; spread them in the sun to dry and harden, and then lie them in bunches by the stalks, and house them, to keep for use as wanted: they will remain good till the next spring and summer. If, in their advancing growth, some are required for present use, before attaining maturity, a few of the early planting may be drawn in May or June; but permitting the general supply to attain full growth as above."—*Abercrombie.*

Use.—It is used by many nations very extensively in cookery, both for seasoning and for food; but not so much by the English or Americans for that purpose. "The medical properties of garlic are various. In dropsical complaints, asthmas, and agues, it is said to have been successfully used. Some instances have occurred, in deafness, of the beneficial effects of wrapping a clove of garlic in muslin, and putting it into the ear. As a medicine internally taken, it is usually administered as a bolus, or made into pills. Its smell is considered as an infallible remedy against vapours, and as useful in nearly all the nervous disorders to which females are subject. An oil is sometimes prepared from garlic, which is so heavy as to sink in water; but the virtues of this pungent vegetable are more perfectly and more readily extracted by spirit of wine than in any other way. A syrup also is made of it.

"The juice of garlic is said to be the best and strongest cement that can be adopted for broken glass and china, leaving little or no mark if used with care. Snails, worms, and the grubs or larvæ of insects, as well as moles and other vermin, may all be driven away by placing preparations of garlic in or near their haunts."—*Dom. Encyc.*

GOOSEBERRY.—*Ribes grossularia.*—The gooseberry is a native of several parts of Europe, and is cultivated to great perfection in Lancashire, in England. Loudon says,

"Happily, this wholesome and useful fruit is to be found in almost every cottage garden in Britain, and it ought to be considered a part of every gardener's duty to encourage the introduction of its most useful varieties in these humble enclosures. In Lancashire and some of the adjoining counties, almost every cottager, who has a garden, cultivates the gooseberry with a view to prizes, given at what are called gooseberry prize meetings; of these there is annually published an account, with the names and weight of the successful sorts, in what is called the *Manchester Gooseberry-Book*. The prizes vary from 10*s.* to £5 or £10; the second, third, to the sixth and tenth degrees of merit, receiving often proportionate prizes. There are meetings held in the spring to 'make up,' as the term is, the sorts, the persons, and the conditions of the exhibition; and in August, to weigh and taste the fruit, and determine the prizes."

Varieties.—Loudon says, "The present lists of the London nursery-men contain from eighty to one hundred names; but those of some of the Lancashire growers above three hundred. Forsyth, in 1800, mentions ten sorts as common; and adds a list of forty-three new sorts grown in Manchester."

Propagation.—The gooseberry may be propagated by all the modes applicable to trees, or shrubs; even by pieces of the roots; but the mode by cuttings is usually adopted for continuing varieties, and that by seeds for procuring them.

By seeds.—So far as we know, the scientific mode of impregnating one variety with another has not been applied to this fruit. In general, the seed of some choice variety, thoroughly ripe, is taken, and sown in autumn, or early in the spring, in beds or pots of rich, light, mellow earth: when the plants are a year old, they are planted out in nursery rows, to be cultivated and trained there a year or two: in general, they will bear the third year.

By cuttings.—The best season for planting gooseberry cuttings is in autumn, just before the leaves begin to fall: early in the spring, as soon as the ground is sufficiently thawed, however, will answer nearly as well. The cuttings should be taken from the bearing shoots. Cut them to such a length as the strength and ripeness of the wood will bear, and cut off all the buds except three, or at most four, at top, and train the plants with a single stem of nine inches or a foot high, from the top of which the branches should radiate upwards at an angle of 40°, or better if 45°.

Haynes, an English writer, advises taking off cuttings in July, when the fruit is on the tree, in order to make sure of the sorts; and says, by immediate planting, watering, and shading, as good plants are produced as from ripe wood cuttings.

"*Soil and site.*—Any good garden-soil, on a dry bottom, and well manured, will suit the gooseberry. That which is soft and moist produces the largest fruit. The situation should not be under the drip of trees over-much shaded or confined, otherwise the fruit will be small, ill-flavoured, and the plants apt to mildew. Forsyth says, gooseberries should be dunged every year, or at least have a good coat of dung once in two years. Haynes recommends a mixture of peat and loam well manured, and a shaded situation. The last he proposes to effect by planting, among his compartments of gooseberries, rows of Jerusalem artichokes in the direction of east and west."—*Loudon.*

Final planting.—"The season for planting gooseberries is any time during open weather, from October till March [or the 1st of April in New England]. When trees are procured from the public nurseries, choose such as are of some advanced size, about three years' growth, with pretty full heads, for immediate plentiful bearers. Let the general supply be in standard bushes, and planted principally in the kitchen-garden, in single rows, along the boundary edges of the main compartments. When the object is to raise large quantities of fruit, plantations are made in continued parallel rows, eight or ten feet asunder, by six feet in the row. It would be eligible to plant a few sorts against south and other sunny walls, or paling, for earlier and larger fruit; and on north walls to ripen late in succession."—*Abercrombie.*

Forsyth says, "The market-gardeners about London plant them in rows, from eight to ten feet apart from row to row, and six feet from plant to plant, in the rows. In small gardens I would recommend planting them in a compartment by themselves, at the distance of six feet between the rows, and four feet from plant to plant; or you may plant them round the edges of the compartments, about three feet from the path; you will then have the ground clear for cropping, and a man, by setting one foot on the border, can gather the gooseberries without injuring the crop."

Neill says, "In some places, gooseberry-trees, on the sides of the borders, are trained to a single tall stem, which

is tied to a stake; this, though six or eight feet high, occasions scarcely any shade on the border, and it does not occupy much room, nor exclude air; while, at the same time, the stem becomes hung close with berries, and makes a pleasant appearance in that state."—*Edin. Encyc.* art. *Horticulture.*

Mode of bearing.—"The gooseberry produces its fruit not only on the shoots of last summer, and on shoots two or three years old, but also on spurs or snags arising from the elder branches along the sides; but the former afford the largest fruit. The shoots retained for bearers should, therefore, be retained at full length, or nearly so."—*Abercrombie.*

Pruning.—"The bushes will require a regular pruning twice in the year."

Summer pruning.—"Where any bushes are crowded with cross and water shoots of the same year, shading the fruit from the sun, and preventing the access of air, thin the heart of the plant and other tufted parts moderately, pinching off or cutting out close what spray is removed; but do not touch the summer shoots in general." Maher says, "It will greatly contribute to the perfection of the fruit, if the very small berries are taken away with a pair of scissors, about the middle or end of May; and these small berries will be found quite as good for sauce, or gooseberry-cream, as the larger."

Winter pruning.—"You may proceed to the winter pruning any time from November until the end of February, or until the buds are so swelled that further delay would endanger their being rubbed off in the operation. Cut out the cross-shoots and water-shoots of the preceding summer, and the superfluous among crowded branches. Prune long ramblers and low stragglers to some well placed lateral or eye; or, if an under-straggler spring very low, cut it away. Of last year's shoots retain a sufficient quantity of laterals and terminals, in vacant parts, to form successional bearers, and to supply the places of unfruitful and decayed old wood, which, as you proceed, should be removed. Mostly retain a leading shoot at the end of a principal branch, leaving it either naturally terminal, or, where the branch would thus be too extended, pruning to some competent lateral within bounds. The superfluous young laterals on the good main branches, instead of being taken off clean, may be cut into little stubs of one or two eyes; which will send out fruit-buds and spurs. Of the supply reserved for new bearers, a small number will probably require shorten

ing, where too extended, or curvated inconmodiously: leave these from eight to twelve inches in length, according to strength and situation; those of moderate extent and regular growth will require very little shortening, and many none at all. Observe, too close cutting, or general shortening, occasions a great superfluity of wood in summer; for the multiplied laterals, thus forced from the eyes of the shortened branches, increase to a thicket, so as to retard the growth, and prevent the full ripening of the fruit: on which account it is an important part of pruning to keep the middle of the head open and clear, and to let the occasional shortening of the shoots be sparing and moderate. Between the bearing branches keep a regulated distance of at least six inches at the extremities, which will render them fertile bearers of good fruit. Some persons, not pruning the gooseberry-tree on right principles, are apt to leave the shoots excessively close and tufted, while they shorten the whole promiscuously; others sometimes clip them with garden shears to close, round heads: in consequence of being pruned in these methods, the bushes shoot crowdedly, full of young wood in summer, from which the fruit is always very small, and does not ripen freely with full flavour."—*Loudon.*

Forsyth says, "Many of the Lancashire sorts are apt to grow horizontally, and the branches frequently trail on the ground, which renders them liable to be broken by high winds, especially when they are loaded with fruit. In that case, I would recommend two or three hoops to be put round them, to which the branches may be tied, to support them, and prevent their being broken by the wind."

Prolonging the crop.—"In addition to planting late sorts in shady situations, the bushes, whether standards or trained, may be matted over when the fruit is ripe, and, in this way, some of the reds, as the Warrington, and the thick-skinned yellow sorts, as the Mogul, will keep on the trees till Christmas."

Insects.—The gooseberry is infested with the caterpillars of several species of flies, and various methods have been prescribed to destroy them, which are detailed by Loudon. —*Encyc. of Gard.* p. 734, 735. The applications he mentions were, generally, made by means of watering-pans and garden-engines, and the substances used were decoctions of tobacco, elder leaves, black currant leaves, soap, quick lime, &c. Mr. Loudon observes, however, that, in his opinion, "the only effectual plan seems to be that of hand-

picking, which, however tedious it may seem, will often be found a more economical mode than any of the above. Hand-picking, with the spring-generated kinds, should commence as soon as the eggs are observed on the undersides of the leaves, of a white colour, and not thicker than hairs: the whole leaf may be picked off, or the eggs brushed or sponged off: with the winter kinds, it ought to commence as soon as they leave their nidus in the soil or bark, and appear on the leaves."

Preventive treatment.—"Sprinkling gooseberry and currant bushes with tar-water prevents the fly or moth from settling on the plant to lay its eggs; this must bedone early in the spring, for, if done after the fruit is set, it will taste of tar."—*J. Busch*, in *Hort. Trans.* iv. 415.

Forcing.—"The gooseberry may be forced in pots or boxes, placed in pits, or in the peach-house or vinery. Hay plants in pots in November, removes to the peach-house in January, and has ripe fruit in the end of April, which he sends to the table growing on the plants."—*Hort. Trans.* iv. 415.

Use.—"The fruit was formerly in little esteem, but it has received so much improvement, that it is now considered very valuable for tarts, pies, sauces, and creams, before being ripe, and, when at maturity, it forms a rich dessert fruit for three months, and is preserved in sugar for the same purpose, and in water for the kitchen. Unripe gooseberries can be preserved in bottles of water against winter; the bottles are filled with berries close-corked and well-sealed; they are then placed in a cool cellar till wanted. By plunging the bottles, after being corked, into boiling water for a few minutes, (heating them gradually to prevent cracking,) the bottles are said to keep better."—*Neill.*

Gooseberry wine is made in the same manner as currant wine, except that one third less sugar is required. In picking the berries, take none that have fallen upon the ground, or that have been shaded and grown sour.

GOURD.—*Cucurbita.*—There are various kinds of gourds, which are, in this country, cultivated rather for ornament than use. They may be sown at the same time, and cultivated in the same manner, as melons and cucumbers; but should be trained to trellises, fences, walls, or to cover arbours. "The large bottle-gourds (*cucurbita lagenaria*) are from ten to fifteen inches in length, and the shells will hold from one to three quarts. They are light, and make good dippers, and, with good usage, will last years. If,

after a few gourds have set, the ends of the vines are pinched off, the fruit will be larger and better. The bicoloured gourd (*cucurbita bicolor*) is a small, beautiful, round fruit, one part a deep green, and the other a bright yellow. Only ornamental."—*Dr. Green.*

GRAFTING is the taking a shoot from one tree, and inserting it into another, in such a manner that both may unite closely, and become one tree. Its use is to propagate any curious sorts of fruits, so as to be sure of the kinds, which cannot be done by any other method.

The grafts or scions should be cut off from the trees before their buds begin to swell, which is generally three weeks or a month before the season for grafting. They may be buried in ground half their length, and their tops covered with dry litter. If a small joint of the former year's wood is cut off with the scion, it will preserve it the better, and be more likely to take when grafted. If the scions are to be carried any considerable distance, it will be best to stick their lower end in a potato, or a lump of well-tempered, moist clay, and then wrap them up in moss, which will preserve them fresh a month, or longer.

The best grafts are from trees raised from seed; next, those raised from cuttings; but those of trees raised from suckers should be rejected. They should be shoots of the last year's growth, and should be chosen from the outside lateral branches of healthy trees. The middle part of each shoot makes the best scions; but long shoots, and especially where the scion is of a rare variety, may be cut into several scions of four or six inches in length, reserving not fewer than two, nor more than five eyes to form the future head of the tree.

The *best stocks* are such as have been allowed much room in the nursery; those planted very close have the wood soft, and the grafts on them are not fruitful.

The materials for grafting are, a strong pruning knife for cutting off the heads of the stocks, previous to their preparation by the grafting knife, for the scion; a small saw for large stocks; and a penknife for very small scions; a chisel and mallet for cleft grafting; bands or strings to tie the grafts with; and grafting clay.

Grafting clay should be prepared at least ten days previous to its being wanted. Loudon directs to prepare it as follows. "Take either stiff yellow or blue clay, or clayey loam or brick earth; in either case adding thereto about a fourth part of fresh horse-dung, free from litter, and a por-

tion of cut hay, mixing the whole together, and adding a little water; then let the whole be well beaten with a stick [or wrought with a hoe] upon a floor, or other hard substance; and, as it becomes too dry, apply more water, at every beating turning it over; and continuing beating it well at top till it becomes flat and soft. This process ought to be repeated more or less, according as the nature of the clay may require to render it ductile, and yet not so tough as to be apt to crack in dry weather: for instance, it should be several times beaten the first day; and the next morning repeat the beating, still moistening it with water; and by thus repeating the beating several times every day, for two or three days, or every other day at least, for a week, it will be in proper order for use; observing that it should be prepared a week at least before it is used; but if a month, the better, keeping it moist. Some recommend salt to be mixed with the clay, and others, ashes or lime, rubbish or drift sand; the object in these cases being to prevent its cracking with the sun; which, however, the horse-droppings, if well incorporated, will, in general, prevent."

The grafting clay of the French and Dutch is composed of half cow-dung, free from litter, and half fresh loam, equally incorporated. They prefer this to all others for excluding the external air from wounds in trees, &c. of every description, and ridicule the idea of certain complex compositions. A French writer on agriculture observes of a noted English composition, (Forsyth's, we believe,) that it is "so complicated and ridiculous in the eyes of those who have any knowledge of chymistry or natural philosophy, that it is a matter of astonishment how it could be proposed in our age."

Substitutes for grafting clay.—These are numerous. Some of them are specified by Loudon, (*Encyc. of Gard.* p. 397,) and in *Thacher's Orchardist*, p. 37, *second* ed. But we have been assured by practical orchardists that most of these are injurious. The pitch, tar, rosin, or turpentine, which composes part of the composition of most or all of them, is injurious to vegetation, and will not withstand the heat of summer.

There are various modes of grafting, of which we shall describe some of the most common.

1. *Whip-grafting*, or, as it is sometimes called, *tongue-grafting*, is most commonly practised in nurseries upon small stocks. The stocks and the scions should be of the same or nearly the same size They are both to be sloped

off a full inch or more, and then tied closely together. This method may be much improved by performing what gardeners call *tongueing* or *tipping;* that is, by making an incision in the bare part of the stock, downwards, and a similar slit in the scion, upwards: after which, they are to be carefully joined together, so that the rinds of both may meet in every part, when a ligament or bandage of bass is to be tied round the scion, to prevent it from being displaced, and the whole is to be covered over, or coated over with the grafting clay above described.

2. *Cleft-grafting*, or *slit-grafting*, is performed on stocks from one to two inches diameter. The head of the stock being carefully cut off, in a sloping direction, a perpendicular cleft, or slit, is to be made about two inches deep, with a knife or chisel, towards the back of the slope, into which a wedge is to be driven, in order to keep it open for the admission of the scion: the latter must now be cut in a perpendicular direction, and in the form of a wedge, so as to fit the incision in the stock. As soon as it is prepared, it should be placed in the cleft, in such a manner that the inner bark of both the stock and scion may meet exactly together. It is then to be tied with a ligature of bass, and clayed over, as is practised in *whip-grafting*, three or four eyes being left in the scion uncovered. It should be observed, that, in making the cleft in the stock, care should be taken not to injure the pith, the scions being inserted in the sap-wood of the stock or branch.

3. *Crown-grafting* is commonly practised upon such stocks as are too large and stubborn to cleave. It is sometimes called grafting in the bark or rind, from the scion being inserted between the bark and wood. This mode of grafting is performed with best effect somewhat later than the others, as the motion of the sap renders the bark and wood of the stock much more easily separated for the admission of the scions. First cut or saw off the head of the stock or branch horizontally, or level, and pare the top smooth; then, having the scions, cut one side of each flat, and somewhat sloping, an inch and a half long, forming a sort of a shoulder at the top of the slope, to rest upon the crown of the stock; and then raise the rind of the stock with the ivory wedge, forming the handle of the budding knife, (or some other suitable implement of a wedge-like shape,) so as to admit the scion between the bark and the wood two inches down. Then place the scion with the cut side next to the wood, thrusting it down far enough for

the shoulder to rest upon the top of the stock; and in this manner may be put three, four, five or more scions, in one large stock or branch. It is alleged as a disadvantage attending this method, in exposed situations, that the ingrafted shoots, for two or three years, are liable to be blown out of the stock by violent winds; the only remedy for which is, tying long rods to the body of the stock or branch, and tying up each scion and its shoots to one of the rods.

4. *Side-grafting* resembles *whip* or *tongue-grafting*, but differs in being performed on the side of the stock, without heading down. It is practised on wall-trees to fill up vacancies, and, sometimes, in order to have a variety of fruits upon the same tree. Having fixed upon those parts of the branches where wood is wanting to furnish the head or any part of the tree, there slope off the bark and a little of the wood, and cut the lower end of the scions to fit the part as near as possible; then join them to the branch, tie them with bass, and clay them over.

5. *Saddle-grafting* is performed by first cutting the top of the stock into a wedge-like form, and then splitting up the end of the scion, and thinning off each half to a tongue-shape; it is then placed on the wedge, embracing it on each side, and the inner barks are made to join on one side of the stock, as in *cleft-grafting*. This is a very strong and handsome mode for standard trees, when grafted at the standard height. It is also desirable for orange-trees and rose-standards, as it makes a handsome finish, covering a part of the stock, which, by the other methods, long remains a black scar, and sometimes never becomes covered with bark. The stocks for this purpose should not be much thicker than the scions, or two scions may be inserted.

6. *Root-grafting* is sometimes performed, in nurseries, on parts of the roots of removed trees, when the proper stocks are scarce; and in which case the root of the white-thorn has been resorted to, as stock both for the apple and pear. In general, however, a piece of the root of the tree of the same genus is selected, well furnished with fibres, and a scion placed on it in any of the ordinary ways for grafting small stocks. Thus united, they are planted so deep as to cover the ball of clay, and leave only a few eyes of the scion above ground. "A variety of this kind of grafting, practised by Knight, is thus described: 'Transplanting, many years ago, some pear-stocks from a seed-bed, of which the soil was soft and deep, I found that the first-

emitted roots of many of them descended a foot or more perpendicularly into the earth, before they divided into any lateral ramifications; and, as I did not like to replant the young trees, with such an inconvenient length of perpendicular root, I cut off about six inches from each. The amputated parts were then accurately fitted and bound, as in *splice* or *whip-grafting*, to scions of pear-trees, which were selected as nearly as possible of the same size; and the roots, with their attached branches, were deposited in the ground as cuttings, so deep that the whole of the root and about an inch of the scion were covered. The soil was then drawn up with the hoe on each side of the plants, which were placed in rows, so that one bud only of each plant was above the soil, and the other just within it. These grafts succeeded perfectly well; and I have subsequently repeated the same experiment, with equal success, upon the apple, the plum, and the peach. In the greater part of these experiments, the roots were perfectly cleansed from mould by washing, before they were fitted to the graft, and were then placed in wet moss, till a sufficient number were ready to be carried to the nursery; a common dibber only was employed in planting them; but the mould was washed into the holes with water, to close it well round the roots, and to supply the place of the clay, used in other methods of grafting.'—*Hort. Trans.* vol. i. p. 239. A variation of this mode consists in leaving that part of the tap-root not wanted, with the removed tree, undisturbed in the soil, and grafting on it there. Such root-grafts grow with uncommon vigour."—*Loudon.*

The time of the year for performing the above kinds of grafting should be, when the sap of the stock has begun to move, in the spring, and just before the buds are unfolded.

7. *Summer-grafting.* A letter from Abner Landrum to the editor of the *American Farmer*, contains the following observations on this subject: "About the 1st of July, when the growth of some trees had become stationary, I cut a twig of the pear-tree, and inserted it on a nursery stock, which readily grew off. I next tried almost every variety of orchard fruits, which succeeded perfectly well. I was induced to make this experiment from the rationality of the theory, it having occurred, upon the slightest reflection, that failures in spring-grafting might originate from the dissipation of moisture by the drying winds peculiar to that season, before the sap of the stock acquires sufficient motion to furnish the graft with due nourishment; but from the rapid

motion of the sap in some stocks, with the general moisture of the air during midsummer, the operation would seldom fail; and the result fully proved this conclusion well founded. It next occurred to me, that the walnut, fig, and persimon, which will not succeed in the spring, except by mere chance, might now answer on the same principle of reasoning: I accordingly made the experiment, and succeeded.

"To make the success of *summer-grafting* certain, take the twigs to be inserted from a tree in which the sap is, as near as possible, stationary; and select a stock in which the sap has the greatest possible motion. July is the proper time for summer-grafting, and indeed the most suitable month of the twelve for that operation. However, the operation may be performed, with tolerable success, during the remainder of the summer and fall months."

8. Another mode of engrafting has been practised, and we believe invented, by Col. J. F. Wingate, of Bath, in the state of Maine. The process and its advantages are thus described in a letter from Col. Wingate to Gen. H. A. S. Dearborn:—"The instrument best adapted to the purpose, and which I have generally made use of in the operation, is a common budding-knife, the handle of which, being smooth and thin, is well designed for separating the bark from the wood of the stock; and this is performed and the scion inserted in the following manner, namely; in the first place, make a horizontal or transverse cut upon the stock or limb to be engrafted, according to its size, from one half to one and a half inch in length. Then at the left end (this being the most convenient) make a perpendicular cut downward, (through to the wood in both cases,) about the same length; take a small chip from the bark just above the horizontal line, or cut at the place where the scion is to be fixed, deep enough to allow the lower or wedge part of it to meet and lay close to the inner bark or sap-wood of the stock. Raise the bark as in budding, and separate it sufficiently from the wood to receive the scion, which should be gently pressed into the proper position, and there secured by slips of bass-mats, or some other soft material, wound around the limb or stock so as to cover the lower part of the scion, and press upon the bark of the tree the whole length of the perpendicular cut; after which I have generally rubbed on a thin coat of engrafting composition, for the purpose of excluding the dew and rain. That which I have found most durable and effectual for this purpose is

made of equal parts of rosin, lard, and beeswax. When cold, it may be cut in thin slices as required for use, warmed in the hand sufficiently to apply and adhere to the wood,—will yield to its growth, and remain until the wound is entirely healed. The scion should be of the usual length, exposing from three to five buds: the part inserted is cut in the wedge form, very much as in the ordinary cleft-grafting, except that the inner side must be bevelled to a proud edge to prevent its injuriously opening the bark of the stock beyond the scion, and opposite to the perpendicular cut. In some of my early experiments, I made a shoulder to the scion to rest upon the outside bark of the stock; but this proved entirely useless, as the scion invariably first took on the inner part, from the ascending sap, except in one instance, in which I reversed the scion, and inserted the top downwards, when, after some delay, it appeared, so far as I could discover the adhesion, to take from the returning sap in the outer bark; but as I made only a single experiment of this kind, and the scion was accidentally removed soon after it had taken, I am unable to give you any additional facts respecting it, which might be either useful or interesting.

"I will now state what I conceive to be the advantages of the present over the ordinary mode of engrafting and of budding. Among the most important, I may perhaps say, that it can be performed with more ease and with greater facility,—that the scion takes more readily and grows more rapidly,—that it may be inserted in any part of the trunk or limb of the tree, without amputating or otherwise injuring it, and where the other mode cannot be easily performed. If it take, the necessary pruning may be made at any subsequent period, and if it fail, the wound in the bark is soon closed, the tree is not disfigured, neither is it retarded in its growth, nor is the quantity of its fruit, if it be in bearing, diminished. Thus it may be said to have all the advantages of budding, with the additional one of producing the new fruit certainly one, and probably two or three years sooner; and further, it may be successfully performed at any season of the year while the sap is in motion, and the scions taken from the growth of the same or of the preceding year. It will be found, too, that the stock is less injured, heals more readily and effectually, than when split, as in the ordinary mode of cleft-grafting. All the branches of a tree may be removed clean to the trunk, and new ones produced, and any shape or form given to the tree by the

insertion of scions at such places as you please. And I am certain that they adhere more firmly, and are less liable to injury from rain or violent winds, than those inserted in a different manner; and, if properly inserted, probably not one in fifty will fail.

"On one tree, to which I gave an entire new top last year, and which had never before blossomed, several fine apples were produced and ripened in perfection, although the scions blossomed about one month later than the parent tree. I ought, perhaps, to add, that one cause of the success and extraordinary growth of some of the scions I have inserted in this way is doubtless the severe pruning I have given the trees about the time they were engrafted; and it may be proper to state, that I have experimented only upon apple-trees, although I am aware of no reason why this mode should not answer equally well on most other kinds of fruit-trees, where budding and grafting could be successfully performed. I have sent you by the packet a specimen of the new mode of engrafting, which is indeed of very extraordinary growth; the scion was inserted the 5th of September, 1824, being the growth of the same year: the leaves of that season died and dropped off, new ones were disclosed, and new buds formed the same autumn, and the two branches are the entire growth of last year, and of the following dimensions, namely; main branch, five and a half feet in length; secondary, four feet and a half; circumference of main branch at the base, 2⅞ inches; the other somewhat less. I have taken off some of the wood of the tree in the bark, of which the scion was inserted, in order that you may perceive how firmly and perfectly it has united with the main stock, which was a scrub apple-tree, and in which two or three scions were likewise inserted in the ordinary mode, whose growth, I think, is less than one half of the one sent you, engrafted in the new way."

Future treatment.—In a month after grafting, it may be ascertained whether the scion has *united* with the stock, by observing the progress of its buds; but, in general, it is not safe to remove the clay for three months or more, till the graft be completely cicatrized. The clay may generally be taken off in July or August, and at the same time the ligatures loosened, where the scion seems to require more room to expand; a few weeks afterwards, when the parts have been thus partially inured to the air, and when there is no danger of the scion being blown off by winds, the whole of

the ligatures may be removed. If the stock was not shortened down close to the graft, or junction of the scion with the stock, at the time of the operation, it may be done now, or as soon as the ligatures can be entirely dispensed with. In particular cases, a ligature round the graft, or a stake or other prop, for the shoots of the scion, may be necessary for a year to come, to protect against winds; or a bandage of moss kept over the graft, to preserve moisture, and encourage the expansion of the parts, and complete the filling up of the wound.—*Loudon.*

Effects of grafting.—The nature of the fruit is, to a certain extent, affected by the nature of the stock. Miller says decidedly, "that crab-stocks cause apples to be firmer, to keep longer, and to have a sharper flavour; and he is equally confident, that, if the breaking pears be grafted on quince stocks, the fruit is rendered gritty or stony, while the melting pears are much improved by such stocks. This, according to Neill, is scarcely to be considered as inconsistent with Lord Bacon's doctrine, 'that the scion overruleth the graft quite, the stock being passive only;' which, as a general proposition, remains true; it being evident, that the scion, bud, or inarched shoot, is endowed with the power of drawing or forming from the stock that peculiar kind of nourishment which is adapted to its nature, and that the specific characters of the engrafted plant remain unchanged, although its qualities may be partially affected."—*Ed. Encyc.* art. *Horticulture.*

GREEN-HOUSE.—A green-house is a building designed to protect, during winter, such exotic plants, shrubs, and trees, as will bear being exposed to the open air during summer, but are too tender for such exposure in winter.

J. W. Watkins, Esq. of New York, gives the following plan for the construction of a green-house, in the *Trans. of the Agric. Soc.* of the above state:—

"The building should be sunk in the earth from two to four feet, in proportion to the size of the house, and according to the nature of the soil; as clay retains moisture, and of consequence produces damps, in such ground it should not be so deep. The height should not exceed twelve feet from the exterior ground, by which it will be less exposed to high winds. The width should not exceed sixteen or eighteen feet, as the sun's rays are, at that distance from the glass, very feeble. A south front is well known to be the true one, but advantage should be

taken of glazing as much of the eastern end as possible, for the benefit of the morning sun. The front should decline northward from a perpendicular with the horizon, so as the angle made thereby with the horizon will, at noonday in winter, bring the rays of the sun to strike the glass at right angles, and the roof should descend the opposite side without a break. By this position of the roof and glass, the rays of the sun are thrown upon every part of the inside of the house, and the whole becomes heated thereby; more of the rays are also introduced into the building, and when the sun produces most heat during the day, there is no reflection of its rays, and at other parts of the day, the reflecting angle, being obtuse, does not powerfully cast off the rays. The inside of the rafters of the roof should be lined with boards, and the space between that and the roof filled with a mixture of straw, sand, and clay, made into mortar; boards should be used in preference to shingles, as, making fewer breaks in the roof, less opportunity is given for the admission of cold air. The residue of the building may be of stone or brick work, or a frame building filled in with bricks, and no flooring of any kind upon the ground. Shutters on the outside are sufficient; and it is preferable to have them hung on hinges, as the least troublesome, to the common practice of sliding ones: they should be made to fold into the spaces between the windows.

"Before putting the plants into the house, the bottom should be covered with bark from a tan-vat, about a foot deep, according to the depth the building is sunk in the earth.

"The advantages proposed by this method of constructing are, the lessening the expense of building; that, the heat of the sun being sufficient to warm the house, the trouble and expense of warming it by a stove is avoided, which unless very carefully attended, the plants may be injured by too much heat, and are always by the smoke that unavoidably makes its way out of the pipes. It would be proper, nevertheless, to make arrangements in constructing the house for using a stove, in case a long succession of cold, cloudy days, by obscuring the sun, should reduce the heat in the house below that degree of temperature necessary for preserving the plants, which is a case that will seldom happen, as one clear day will warm the house sufficiently to admit its being shut up for several days.

"Plants in a house of this kind require less water, and do not suffer for the want of atmospheric air. It is probable,

as the earth is charged with electric fluids, as egetable substances are known conductors of it, that the bark, by its fermentation, not only generates heat, but serves as a mean to produce out of the earth an atmosphere for the plants, sufficient, with such atmospheric air as will find admission, to supply the quantity exhausted by the daily rarefaction occasioned by the sun's heat.

"A green-house has been used upon this construction in this state, without having had the least occasion of being heated by fire. The plants in the spring were remarkably thrifty; tropical fruit ripened in it during the winter, and young fruit formed on the trees. It required no other care, than now and then watering the plants, and shutting the windows as soon as the sun left them."

With respect to the management of plants in green-houses, it is recommended occasionally to open the mould in which they are set, to scatter a little fresh earth on the pots, and over this to lay a little dung. It will also be advisable to water them when the leaves begin to curl or wither, and to pluck off such as are decayed; but these operations should not be too frequently repeated.

"Some people," says M'Mahon, "are desirous of keeping out their plants as long as possible; this is very right, but it ought not to be extended to too hazardous a period; for one night's frost would cause the leaves to lose their fine green colour, which perhaps might not be restored during the whole winter; and, if any way severe, serious injury might be sustained.

"If the windows and doors are kept open day and night, as long as there is safety in so doing, the plants will be nearly as well off as in the open air, and no danger is encountered: the mere difference of five or six days in the taking in of the plants will ensure safety; but, on the other hand, it is not right to be too precipitate in housing them, before the common appearance of the weather indicates the necessity."

HAWTHORN.—*Cratægus.*—There are a great many species of this genus of plants, (*see* HEDGE,) of which the *oxycantha*, or English hawthorn, as it is commonly named in the United States, is most generally cultivated for the purpose of forming hedges. The manner of raising the thorn quicks is as follows:—

Collect your seeds in autumn, mix them with equal quantities of light, sandy earth, and lay them in that state on the surface of a dry spot of ground in your best enclosed

garden, where they cannot be disturbed by hogs, &c.; form this mixture into a narrow, sloping ridge, tapering to the top, and cover it with light, loose earth, two inches thick all over; the April following, turn this ridge, mixing the whole together, and form it again the same way, covering in like manner as before, with two inches deep of light, loose earth; repeat this again in the months of July and August, by which the seeds in every part will be equally prepared for vegetation. A trench must be cut round this ridge, to prevent any water from lodging about the seeds; for this would rot many and injure others, especially in the second winter, when the stones would be losing their cementing quality, and begin to open; for until this is effected the kernels cannot vegetate. Hence the necessity and great advantage of not burying the stones in the earth, as is injudiciously practised by many.

There is not the least danger to be apprehended from frost injuring the seeds, whilst so much exposed to it in those ridges; however, it will not be amiss to strew a light covering of long litter over them on the approach of winter; which will keep them dry, and in a better state for sowing when the season arrives.

"Your haws being prepared as above, make ready a piece of good rich ground, neither upon an elevated situation, nor too low; in the former the summer drought would be unfriendly, and in the latter they would be subject to mildew: this must be done as early in the spring as you can get the ground to work freely, and pulverize well; for the haws begin to throw out roots at a very early period; and if not sown at this time, or before, a great number of these roots will be broken off in the act of sowing, and thereby totally lost; the others which escape this accident, having their radicles extended on the surface, penetrate the earth at the extreme points of those roots, forming right angles with the parts already produced, by which means they can never drive up the seed leaves with as much vigour as if the radicles descended immediately in a perpendicular direction from the stones of the fruit; hence the necessity of early sowing.

"The ground, however, must not be wrought while wet, or at least the seeds should not be covered with wet or heavy earth, nor too deep, for if the surface should cake, or become stiff in consequence of dry weather ensuing, few of these young plants, having broad seed leaves, could bear up through it; therefore, you must be very cautious

in that point, and if the earth of your bed is not light and dry enough for this purpose, you must carry as much as will cover the seeds from some dry compost heap, or some quarter of the garden, where it can be found in a suitable condition.

"On examining your haws, if you find the earth in which they are mixed any way clogged with too much moisture, so that the parts and seeds would not separate freely in the act of sowing; mix therewith a sufficient quantity of slaked lime, or wood-ashes, to accomplish that end.

"Having every thing in readiness, and your ground well dug, *and raked effectually as you proceeded in the digging*, still presuming that it is in the best possible state of preparation, lay it out into four feet wide beds, leaving twelve or fourteen inches of an alley between each, and with the back of the rake push off into these alleys about three quarters of an inch of the fine raked surface of the beds, one half of each bed to the one side, and the other to the opposite; this done, sow your haws thereon, earth and all, as they had lain, so thick that you may expect a thousand plants at least, after every reasonable allowance for faulty or imperfect seeds, (there being many of these,) on every three or four yards of your beds;—I have often had that number on as many feet;—then with a spade or shovel cast the earth out of the alleys evenly over the beds, covering the seeds not more than three quarters of an inch deep, and not more than half an inch, if the earth be any way stiff; after which rake the tops of the beds *very lightly*, taking care not to disturb the seeds, in order to take off the lumps, and to give a neat appearance to the work."—*M'Mahon.* If any stiffness of the ground is perceived, the beds should have frequent and *gentle* waterings; and great care will be necessary to keep the beds free from weeds from the moment the plants appear above ground till they are fit to be planted in hedge-rows, and have arrived at such a size that weeds cannot materially injure them.

Mr. Kirk, of Brandywine, has been successful in making the seeds of the American thorn vegetate, by washing them clean, putting them in hot water to swell them, and exposing the water in which they were immersed to be frozen and thawed several times. Dr. Mease, of Philadelphia, says, "The haws of the Washington thorn, *Cratægus cordata*, require to be buried one winter before they sprout, and they should be put into the ground the same autumn

they are taken off the tree; the pulp which surrounds them having been previously rubbed off and the stone washed. The usual way is to put them in a box of sand, and to stand it under the eaves of a house, to receive the dropping of water from it, and by the spring they will be open and ready for planting."—*Mem. Phil. Agr. Soc.* vol. iii. p. 439. *See further*, HEDGES.

Insects.—A great enemy to the hawthorn is the *borer*, (*saperda bivitata*,) the same which infests apple-trees, &c.; and we know of no method of guarding against its ravages. It is said, however, that this insect has never made its appearance in the interior parts of the United States, and is to be found only within the distance of a few miles from the sea shore.

HEADING DOWN FRUIT-TREES.—"When any fruit-trees have begun to decline, and are thin of young wood, you may often restore them by heading down such limbs as are in the worst state to those parts where young shoots appear, and close to the most vigorous; but this should not be done, generally, the same season, lest it give such a sudden check to the sap as totally to destroy the tree. But if every other branch all over the tree were headed at proper lengths, each close to some young shoot, new, healthy wood would be produced, which would soon come into bearing. The next spring after the first branches were headed, the remaining old branches may be cut out, as directed above; after which the head of the tree will soon be filled with bearing wood, which may afterwards be pruned as directed for other trees."—*M'Mahon.*

HEDGES.—A great variety of shrubs and trees have been made use of for hedges, among which are various kinds of thorns, such as the *Cratægus oxyacantha*, or common European hawthorn, or white thorn; the *Cratægus coccinea*, or great American hawthorn; the *Cratægus crus-galli*, or cockspur hawthorn; the *Cratægus cordata*, or American hedge thorn; crab and apple-trees, horn-beam, beech, honey-locust, buckthorn, holly, white mulberry, juniper, red cedar, &c. &c.

Mr. Quincy, of Massachusetts, has given a statement of his mode of making hedges of the *Cratægus cordata*, which was published in the third volume of the *Mass. Agr. Rep.* p. 27. The seedling thorns (ten thousand) were obtained from the nursery of Thomas Main, near Georgetown, D. C., and planted in a hedge-course of two hundred and fifty-five rods, so far as was necessary to fill that extent in one line,

each plant being five inches apart. The residue were planted in a nursery, for the purpose of filling vacancies.

The hedge-course was made in sandy land, ploughed of the width of four feet, and manured and prepared precisely as for Indian corn; except, only, that, after ploughing, the centre, for two feet wide, was turned over with the spade, and the hedge planted without further preparation. Mr. Quincy advises to the following course:—"Plough the hedge-course *six feet* wide. Plant the whole course one year to potatoes. This pays for the labour as much as other land thus planted. Set the thorns *eight inches* apart. This is near enough in a country like this, where hogs are not permitted to run at large, and makes a considerable saving in labour as well as the cost of the plants. Keep both sides of the hedge planted with potatoes, during the whole six years that the hedge is coming to perfection. The potatoes will nearly pay the cost of the labour. The manure for the potatoes benefits the hedge; and, while hoeing the potatoes, keeping the hedge clear of weeds is easy.

"To keep the hedge clear of weeds, and to fill up the vacancies regularly in the spring of every year, with plants of the same age with those of the original hedge, are the two essential objects of attention after the hedge-course is prepared, and the plants are set. Younger plants may answer, but whoever would make a hedge, in the most speedy and perfect manner, ought to procure, at the time of obtaining the plants for the original hedge, a sufficient extra number to supply all deficiencies likely to occur during the whole time the hedge is forming; to be kept at a nursery, thriving, if possible, a little better than those in the hedge-course."

With respect to the age at which plants for hedges ought to be used, Loudon says, "Three years old are certainly the youngest that should be transplanted, and if they are six or seven years old, so much the better; the prevailing idea that plants of that age will not thrive, if transplanted, is totally unfounded." He likewise recommends assorting the plants, and setting those together which are nearly of a size; because, "when no pains have been taken in assorting the plants, and they are planted promiscuously, great and small, strong and weak, the consequence is, that the strongest plants very soon outgrow such as are weaker, and not only overtop them, but also deprive them of that nourishment which they so much require. As the hedge advances in age, the evil becomes greater; small, stunted

plants and innumerable gaps appearing throughout the whole line of the fence, interspersed with others remarkable for their strength and luxuriance.

"This assorting of hedge-plants has another advantage, namely, that of putting it in the power of the person, who plants the hedge, to put down the large, strong, healthy plants upon the poorest parts of the line of fence, and to set such as are smaller and weaker upon the richer and more fertile parts. He has it also in his power, by a more careful preparation of the soil, and bestowing a greater proportion of manure on the places where the plants are set, to give them that nourishment and assistance which they require, and which would very soon enable them to form a fence equal to that part occupied by the strongest plants."

Hedges may be of various kinds, such as the single hedge and ditch; the hedge and bank; the level hedge, &c.; of which, descriptions may be found in Loudon's *Encyclopedia of Agriculture*, and other books of husbandry.

It is often found necessary to plash or interweave the branches of hedges. Some advise to cut off the tops, or head them down to about three feet, or three feet and a half from the ground, when the plants are about four years old, &c. &c. See *Loudon's Encyc. of Agr.; Farmer's Assistant; Willich's Dom. Encyc.; Mem. of N. Y. Board of Agr.* vol. ii. p. 161.

A writer in the *Mass. Agr. Rep.* says, "The best plant for hedges, so far as the experience of one of our cultivators, Ezekiel H. Derby, will go, and he has tried it for many years, is the buckthorn. It makes a close, beautiful hedge, and is not subject to any disease, nor the depredations of any devourer, so far as we yet know." *See* art. BUCKTHORN, p. 56.

HOEING.—"The ends to be answered by hoeing are chiefly these:—1. To destroy weeds, which are always ready to spring up in every soil, and which would rob the cultivated plants of most of their food. Scraping the surface, if it be done frequently, may answer this purpose; but to destroy the roots of weeds, deeper hoeing is necessary.—2. To keep the soil from becoming too compact, which prevents the roots from extending themselves freely in search of their food; at the same time keeping up a fermentation, by which the vegetable food is concocted, and brought into contact with the roots. For this purpose, the deeper land is hoed, the better. But hoeing should cease, or be only superficial, when the roots are so far extended

as to be much injured by hoeing. They will bear a little cutting without injury. For where a root is cut off, several new branches will come in its place.—3. To render the soil more open and porous, so that it shall greedily drink in the nightly dews, and that rain may not run off, but readily soak in as it falls, and be retained. Accordingly, the more and oftener land is hoed, the more moisture it retains, the better it bears drought, and the more its plants are nourished.—4. Another design of hoeing, and which has not been enough attended to, is, to nourish plants by drawing fresh soil near to them, the effluvium of which enters their pores, and increases their growth. At the same time the earthing of plants makes them stand more firmly, and increases their pasture in the spots where the roots most abound; and prevents the drying of the earth down to the roots."—*Deane.*

HORSE-RADISH.—*Cochlearia Armoracia.*—The following instructions for cultivating horse-radish are by Knight, a celebrated English horticulturist:—"Horse-radish thrives best in deep, soft, sandy loam, that is not very dry in summer, nor inundated in winter; the situation must be open. During winter, [or in autumn,] trench the ground three feet deep; and in the following February [as soon as frost will permit in this country] procure your sets, in the choice of which take the strongest crowns, or leading buds, from old plants, cutting them about two inches long. Mark out the ground in four feet beds, and one foot alleys; then take from the first bed nine inches of the top soil, laying it upon the adjoining bed; after which take out an opening at one end of the bed, in the common way of trenching, fifteen inches deep from the present surface; then level the bottom, after which plant a row of sets across the bed at nine inches apart, each way, with their crowns upright; afterwards dig the next trench the same width and depth, turning the earth into the first trench, over the row of sets; thus proceeding, trench after trench, to the end. Where more than the produce of one bed is required for the supply of the family for twelve months, the third bed is next to be planted, which treat as directed for the first, only observing to lay the earth on the fourth, and so on to any number of beds. Upon every alternate bed, which is not planted, a dwarf annual crop may be grown. The plants must be kept clear from weeds during summer; and as soon as the leaves decay in autumn, let them be carefully raked off with a wooden-toothed rake; in the following February,

[or as soon as frost will permit,] eighteen inches of the earth of the unplanted bed must be laid, as light as possible, and equally, over the beds that are planted; then trench and plant the vacant beds exactly in the same manner as before directed. The following autumn, the first-planted horse-radish may be taken up, by opening a trench at one end of the bed, to the bottom of the roots, so that the sticks or roots of horse-radish may be taken up entire and sound, which, for size and quality, will be such as have not generally been seen. The following February, [March or April,] the one year old crop will require additional earth, as before directed, which must of course be taken from those beds, which are now vacant, which when done, if the ground appears poor, or unlikely to produce another vigorous crop, they must have a coat of manure."—*Hort. Trans.* i. 207.

"Judd has also written on the culture of horse-radish, (*Hort. Trans.* v. 302,) and his practice, though very different from Knight's, is also excellent, and perhaps preferable. Knight takes strong buds from old plants, while Judd takes about three inches of the top part of each stick or root, and then cuts clean off about a quarter of an inch of this piece under the crown, so as to leave no appearance of a green bud. Judd trenches only two feet deep, and, if he applies manure, puts it in the very bottom of the trench; 'for, if not so done, the horse-radish, which always puts out some side roots, would send out such large side roots from the main root, in search of the dung lying contiguous, as materially to injure the crop. In planting, holes are made eighteen inches apart every way, and sixteen or eighteen inches deep. The root-cuttings are let down to the bottom of the holes, which are afterwards filled up with fine sifted cinder-dust, and the surface of the bed is then raked over. The season of planting is the latter part of March.' The essential difference between Knight's plan and Judd's is, that the former produces his root from the root-end of the cutting downwards, and the latter from the bud-end upwards: hence the one plants near the surface, and the other near the bottom of the trench. Judd's mode seems more certain of producing one entire strong root than Knight's."—*Loudon.*

Use.—The root, when scraped into shreds, is much used at the table as a condiment for fish, roast beef, &c. If intended for immediate use, it should, says Willich's *Domestic Encyclopedia.* "be dug out of the ground *fresh*, only

from October to March; or be gathered in the spring; then dried, reduced to powder, and preserved in bottles closely stopped for occasional use; when it should be previously moistened with spring water. When steeped and digested in vinegar during a fortnight, this root is said effectually to remove freckles in the face." It is likewise recommended in cases of dropsy, scurvy, rheumatism, palsy, &c.—*Phillips' History of Vegetables.*"—*New England Farmer*, vol. v. pp. 269, 270.

HOT-BED.—A hot-bed, in gardening, is a small bed or mound of earth, composed of certain substances, which, by their fermentation, give warmth to vegetables or seeds, set or sowed in them, and thus hasten their growth. The fermenting substances used for forming hot-beds are, stable litter or dung, in a recent or fresh state, tanners' bark, leaves of trees, grass, and the herbaceous parts of plants generally.

"Stable dung is in the most general use for forming hot-beds, which are masses of this dung after it has undergone its most violent fermentation. These masses are generally in the form of solid parallelograms, of magnitude proportioned to the frames which are to be placed on them, the degree of heat required, and the season of the year in which they are formed.

"Tanners' bark is only preferred to dung because the substance, which undergoes the process of putrid fermentation, requires longer time to decay. Hence it is found useful in the bark-pits of hot-houses, as requiring to be seldomer removed or renewed than dung, or any other fermentable substance, that can be procured in equal quantity.

"Leaves, and especially oak leaves, come the nearest to bark, and have the additional advantage, that, when perfectly rotten, like dung, they form a rich mould, or excellent manure; whereas, rotten tanners' bark is found rather injurious than useful to vegetation, unless well mixed with lime and earth.

"*Preparation of manures.*—The object of preparation in these three substances being to get rid of violent heat, which is produced when the fermentation is most powerful, it is obvious, that preparation must consist in facilitating the process. For this purpose, a certain degree of moisture and air in the fermenting bodies is requisite; and hence the business of the gardener is, to turn them over frequently, and apply water when the process appears impeded for want of it, and exclude rain when it seems chilled and im-

peded by too much water. Recent stable dung generally requires to lie a month in ridges or beds, and be turned over in that time thrice, before it is fit for cucumber beds of the common construction. But for linings, or for frames with moveable bottoms, three weeks, a fortnight, or less, will suffice; or no time at all need be given, but the dung formed at once into linings. Tan and leaves, in general, require a month; but much depends on the state of the weather, and the season of the year. Fermentation is always most rapid in summer; and if the materials are spread abroad during frost, it is totally impeded.

"The formation of the dung-beds is effected by first marking out the dimensions of the plan, which should be six inches wider on all sides than that of the frame to be placed over it; and then, by successive layers of dung, laid on by a fork, raising it to the desired height, pressing it gently and equally throughout. In general, such beds are formed on a level surface; but Knight's mode is, to form a surface of earth as a basis, which shall incline to the horizon, to the extent of fifteen degrees: on this he forms the dung-bed to the same inclination; and, finally, the frame, when placed on such a bed, if, as is usual, it be deepest behind, will present its glass at an angle of twenty degrees, instead of six or eight; which is, undoubtedly, of great advantage in the winter season. This seems a very desirable improvement, where light is an object, which it must be in a high degree in the case of the culture of cucumbers and melons, as well as in forcing flowers.

"Ashes are often mixed with the dung of hot-beds, and are supposed to promote the steadiness and duration of their heat, and at first to revive it if somewhat decayed. Tan and leaves have been used for the same purpose; and it is generally found, that about one third of tan and two thirds of dung will form a more durable and less violent heat than a bed wholly of dung. The heat of dung-beds is revived by linings or collateral and surrounding walls or banks of fresh dung, the old dung of the bed being previously cut down close to the frame. These linings, as before observed, require less preparation than the dung for the beds. The dung-bed, being formed, and having stood two or three days with the frame and lights placed over it to protect it from rain, is next to be covered with earth of quality, and in quantity, according to the purpose to which it is to be applied. In severe weather, the sides of the

bed are often protected by bundles of straw or fagots, which tend to prevent the escape of the heat."—*Encyc. of Gardening.*

HOT-HOUSE.—"A hot-house is a building intended to form a habitation for vegetables; either for such exotic plants as will not grow in the open air of the country where the building is erected, or for such indigenous and acclimated plants as it is desired to force or excite into a state of vegetation, or accelerate their maturation at an extraordinary season.

"Such heat as is required, in addition to that of the sun, is most generally produced by the ignition of carbonaceous materials, which heat the air of the house, either directly, when hot embers of wood are left in a furnace or stove, placed within the house, as in Sweden or Russia; mediately, as when smoke and heated air, from or passing through ignited fuel, is made to circulate in flues; or indirectly, when ignited fuel is applied to boil water, and the hot vapour, or water itself, is impelled through tubes of metal or other conductors, and either to heat the air of the house at once, as in most cases, or to heat masses of brick-work, sand, gravel, rubble, or earth, tan, or even water, (*Hort. Trans.* vol. iii.,) which materials may afterwards give out the heat so acquired slowly to the atmosphere of the house. But heat is also occasionally supplied from fermenting vegetable substances, as dung, tan, leaves, weeds, &c., applied either beneath or around the whole or a part of the house, or placed in a body within it."—*Encyc. of Gardening.*

Steam affords the most simple and effectual mode of heating hot-houses, and indeed large bodies of air in any building, and is the most convenient carrier of heat, which human ingenuity has ever discovered or employed.—See *Encyc. of Gardening*, from p. 310 to pp. 333, 502, &c.

HYSSOP.—*Hyssopus officinalis.*—This is a hardy plant, a native of the south of Europe, and grows to the height of about eighteen inches.

Propagation and culture.—"It is raised by slips and cuttings of the branches, and by slips of the root and top together. It likes a dry and sandy soil. When it is propagated by seed, sow in March or April a small portion, either broad-cast and raked in, or in small drills six inches apart. The plants may mostly be transplanted into final beds in June or July, nine inches apart, or some may be planted as an edging; or you may also sow some seed for an edging, to remain where sown. Give the edgings occa-

sionally trimming in their established growth; cutting away also any decayed flower-spikes in autumn. You may take rooted offsets from established plants in March, April, August or September, cuttings from the stalks in April and May; also rootless slips of the young shoots in June or July. After May, shade for a time, or plant in a shady border. If for culinary purposes, the distance from plant to plant may be nine inches; in the physic garden, eighteen inches or two feet. Water at planting, and twice or thrice a week in dry weather till rooted."—*Abercrombie.*

Use.—The leaves and young shoots are occasionally used as a pot-herb, and the leafy tops and flower-spikes are cut, dried, and preserved for medicinal purposes. They are particularly recommended in humoral asthmas, coughs, and other disorders of the breast and lungs.

INARCHING.—This method of engrafting is used, when the stock intended to graft on, and the tree from which the graft is taken, stand so near (or can be brought so near) that they may be joined together. The method of performing the operation is as follows:—

Take the branch you would inarch, and, having fitted it to that part of the stock where you intend to join it, pare away the rind and wood on one side about three inches in length. After the same manner cut the stock or branch in the place where the graft is to be united, so that the rind of both may join equally together, that the sap may meet; then cut a little tongue upwards in the graft, and make a slit in the stock downward to admit it; so that, when they are joined, the tongue will prevent their slipping, and the graft will more closely unite with the stock. Having thus placed them exactly together, they must be tied with some bass; then cover the place with grafting-clay, to prevent the air from entering to dry the wound, or the wet from getting in to rot the stock; you should also fix a stake in the ground, to which that part of the stock, and likewise the graft, should be fastened, to prevent the wind from breaking them asunder. In this manner they should remain about four months, when the graft may be cut from the mother tree, sloping it off close to the stock, and at the same time covering the jointed parts with fresh grafting clay.

INDIAN CORN.—*Zea.*—We shall not undertake to state the various methods employed for the field-culture of this valuable vegetable, with which it is presumed our readers are, generally, acquainted. But as it is often wanted as a culinary article, for early use, and cultivated in

gardens for the supply of the table, we will give M'Mahon's mode of raising it:—

"Procure some seed of the *earliest* kind, and select a piece of dry, sandy, and tolerably rich ground, in a warm exposure. After preparing it as for peas, &c. form shallow drills, about two inches deep, at the distance of six feet from each other; [four feet and a half, or five feet, will answer for the smallest sorts;] drop the seeds therein two feet and a half asunder, and two grains in each place; strew a little wood-ashes in the drills, and cover the seeds as you would peas. As the plants advance in growth, earth them up two or three times. For an early crop, you may plant the seed, in the Middle States, about the first of May, [about the 10th in the Eastern States,] or ten days earlier, should the season prove very favourable.

"This method is exclusively intended for the culture of the small early kinds."

INOCULATION, *or* BUDDING.—"The object in budding is the same as in grafting, and depends on the same principle; all the difference between a bud and a scion being that a bud is a shoot or scion in embryo.

"A new application of budding has been made by Knight. It is that of transferring 'a part of the abundant blossom-buds from one tree to the barren branches of others.' He tried this first on roses, and afterwards on pears and peaches, with much success.

"*Advantages of budding.*—Budded trees are generally two years later in producing their fruit than grafted ones; but the advantage of budding is that, where a tree is rare, a new plant can be got from every eye; whereas by grafting it can only be got from every three or four eyes. There are also trees, which propagate much more readily by budding than grafting; and others, as most of the stone fruits, are apt to throw out gum when grafted. When grafting has been omitted, or has failed, in spring, budding comes in as an auxiliary in summer.

"*Season of budding.*—The operation of common budding is performed any time from the beginning of July to the middle of August; the criterion being the formation of buds in the axillæ of the leaf of the present year. The buds are known to be ready by the shield or portion of bark, to which they are attached, easily parting with the wood. The buds preferred are generally those on the middle of a young shoot, as being neither so apt to run to wood as those at the extremity, nor so apt to lie dormant as

those at the lower end. In some cases, however, the buds from the middle and extremity of the shoots are to be rejected, and those taken which are at the base of the annual shoots, as Knight (*Hort. Trans.* vol. iii. p. 135) found in the case of the walnut-tree. Scalope budding may be performed in the spring, or at any season.

"*Stocks for budding* may, in general, be much smaller than for grafting, as the operation may be performed on the same year's shoot. But it may also be performed on shoots or stems of several years' growth, and in such, by inserting a number of buds, a complete tree may be formed at once. Scalope budding may be performed on trees of considerable age.

"*Choice of buds.*—For gathering the shoots containing the buds, a cloudy day, or an early or late hour, should be chosen, on this principle, that the leaves, being at these periods in a less active state of perspiration, suffer least from being separated from their parent plant. They are preserved fresh, and may be sent a great distance by inserting their ends in water or moist moss; though in general they should be used as soon after gathering as possible; indeed, as in grafting and inarching, the whole operation ought to be performed with the greatest celerity.

"*Kinds of budding.*—Professor Thouin enumerates twenty-three species and varieties of budding; but we shall here describe only four, of which but one variety is in general use in Britain.

"*Shield-budding*, or T *budding*, is thus performed:—Fix on a smooth part on the side of the stock, rather from than towards the sun, and of a height depending, as in grafting, whether dwarf, whole or half standard-trees are desired; then, with the budding-knife, make a horizontal cut across the rind, quite through to the firm wood; from the middle of this transverse cut, make a slit downward, perpendicularly, an inch or more long, going also quite through to the wood. This done, proceed with all expedition to take off a bud; holding the cutting or scion in one hand, with the thickest end outward, and, with the knife in the other hand, enter it about half an inch or more below the bud, cutting near half way into the wood of the shoot, continuing it with one clean slanting cut, about half an inch or more above the bud, so deep as to take off part of the wood along with it, the whole about an inch and a half long; then, directly, with the thumb and finger, or point of the knife, slip off the woody part remaining to the bud; which

done, observe whether the eye or gem of the bud remains perfect; if not, and a little hole appears in that part, it is improper, or, as gardeners express it, the bud has lost its root, and another must be prepared. This done, placing the back part of the bud or shield between your lips, expeditiously, with the flat haft of the knife, separate the bark of the stock on each side of the perpendicular cut, clear to the wood, for the admission of the bud, which directly slip down, close between the wood and bark to the bottom of the slit. The next operation is to cut off the top part of the shield, and protrude granulated matter between it and the wood, so as to effect a living union. The parts are now to be immediately bound round with a ligament of fresh bass, previously soaked in water to render it pliable and tough, beginning a little below the bottom of the perpendicular slit, proceeding upward, closely round every part, except just over the eye of the bud, and continue it a little above the horizontal cut, not too tight, but just sufficient to keep the whole tight, and exclude the air, sun, and wet.

"*Shield-budding reversed*, or *reversed* ⊥ *budding*, differs from the former in having the transverse cut made at the bottom of the perpendicular slit, instead of at its top, and, of course, the shield is reversed in its position. This mode is represented as preferable to the other, by such as contend that the sap rises in the bark equally with the wood; but as this opinion is now generally considered as exploded, the first, or T mode, may justly be considered as the most scientific mode of budding.

"*Scalope-budding* consists in paring a thin, tongue-shaped section of bark from the side of the stock; and in taking a similar section from the shoot of buds, in neither case removing the wood. The section or shield containing the bud is then laid on the corresponding scollop in the stock; its upper edge exactly fitted, as in shield-budding, and at least one of its edges, as in whip-grafting. After this, it is tied in the usual way. The advantages of this mode are, that it can be performed when the wood and bark do not separate freely; on trees having very stiff, thick, suberose [cork-like] barks, and at any season of the year. Its disadvantages are, that it requires longer time to perform the operation, and is less certain of success. The French gardeners often bud their roses in this manner in spring; and if they fail, they have a second chance in July, by using the common mode.

"*Budding with double ligatures* is a mode invented by Knight, and described by him (*Hort. Trans.* vol. i. p. 194) as 'a new and expeditious mode of budding.' The operations are performed in the manner first above described; but, instead of one ligature, two are applied, one above the bud inserted on the transverse section through the bark; the other, which had no further office than that of securing the bud, was applied below in the usual way. As soon as the buds had attached themselves, the lower ligature was taken off, but the others were suffered to remain. 'The passage of the sap upwards was, in consequence, much obstructed, and the inserted buds began to vegetate strongly in July, (being inserted in June;) and when these had afforded shoots about four inches long, the remaining ligatures were taken off to permit the excess of sap to pass on, and the young shoots were nailed to the wall. Being there properly exposed to the light, their young wood ripened well, and afforded blossoms in the succeeding spring; and these would,' he adds, 'no doubt have afforded fruit; but that, leaving my residence, I removed my trees,' &c.

"*Future treatment.*—In a fortnight, at furthest, after budding, such as have adhered may be known by their fresh appearance at the eye; and in three weeks, all those which have succeeded will be firmly united with the stock, and, the parts being somewhat swelled in most species, the bandage must be loosened, and, a week or two afterwards, finally removed. The shield and bud now swell in common with the other parts of the stock; and nothing more requires to be done till spring, when, just before the rising of the sap, they are to be headed down close to the bud, by an oblique cut, terminating about an eighth or a quarter of an inch above the shield. In some cases, however, as in grafting, a few inches of the stalk is left for the first season, and the young shoot tied to it for protection from the winds."—*Encyc. of Gardening.*

Mr. Abner Landrum mentions a mode of treating the stock, and recently inserted bud, somewhat different from that of Mr. Knight, as detailed above. Instead of Mr. Knight's method of using a strong ligature above the inserted bud, he adopts the following:—As soon as it can be ascertained that the bud will live, which, he says, may be in about a week, if the stock be small, let it be instantly headed down, just above the bud to be nourished. If the stock be large, amputate the principal branches; and the consequence will be, an immediate bursting of all the latent

buds, together with the inoculated one. As the inoculated branches multiply, diminish the original one till nothing remains but the new tree.—*N. E. Farmer*, vol. i. p. 146.

Mr. Buel, of Albany, in a note to *A Treatise on Gardening*, written by Mr. Armstrong, says, "The modern, and, from experience, I do not hesitate to call it the best, method, is, to insert the bud *without separating the wood from it.* I have budded, the two last years, in June. If thus inserted early, and the stocks headed down when the ligatures are removed, the buds often make half a year's growth the same season, and are not so apt to suffer from the severity of the winter, as those which remain dormant."—*Mem. of N. Y. Board of Agriculture*, vol. iii. p. 17.

INSECTS.—It would far transcend our limits to give even a brief description of the various sorts of insects which injure gardens, cultivated fields, &c., and destroy the best productions of our soil. We shall, therefore, confine ourselves to stating, briefly, some of the most approved modes of counteracting the ravages, and effecting the destruction, of a few of those which are most injurious to the cultivator.

The preventive operations are those of the best culture, in the most extensive sense of the term, including what relates to choice of seed or plant, soil, situation, and climate. If these are carefully attended to, it will seldom happen, that any species of insect will effect serious and permanent injury. Vegetables, which are vigorous and thrifty, are not apt to be injured by worms, flies, bugs, &c. Fall ploughing, by exposing worms, grubs, the larvæ of bugs, beetles, &c., to the intense frosts of our winters, is very beneficial. Insects may be annoyed, and, oftentimes, their complete destruction effected, by sprinkling over them, by means of a syringe, watering-pot, or garden-engine, simple water, soap-suds, tobacco-water, decoctions of elder, especially of the dwarf kind, of walnut leaves, bitter and acrid herbs, pepper, lye of wood-ashes, or solutions of pot and pearl ashes, water impregnated with salt, tar, turpentine, &c.; or, they may be dusted with sulphur, quick-lime, and other acrid substances. Loudon says, "Saline substances, mixed with water, are injurious to most insects with tender skins, as the worm and slug; and hot water, where it can be applied without injuring vegetation, is equally, if not more powerfully, injurious. Water heated to 120 or 130 degrees will not injure plants, whose leaves are expanded, and, in some degree, hardened; and water at 200 degrees, or upwards, may be poured over leafless plants. The effects of

insects may also be palliated on one species of plant, by presenting to them another, which they prefer: thus wasps are said to prefer carrots, the berries of the yew, and the honey of the hoya, to grapes; honey, or sugared water, to ripe fruit, and so on. One insect or animal may also be set to eat another, as ducks for slugs and worms, turkeys for the same purpose, and caterpillars and ants for aphides, and so on."

The Rev. Mr. Falconer, one of the correspondents of the Bath Agricultural Society, strongly recommends soap-suds, both as a manure and antidote against insects. He observes, that "This mixture of an oil and an alkali has been more generally known than adopted as a remedy against the insects which infest wall fruit-trees. It will dislodge and destroy the insects which have already formed their nests, and bred among the leaves. When used in the early part of the year, it seems to prevent the insects from settling upon them." He prefers soap-suds to lime-water, because lime soon "loses its causticity, and with that its efficacy, by exposure to air, and must, consequently, be frequently applied; and to the dredging of the leaves with the fine dust of wood-ashes and lime, because the same effect is produced by the mixture, without the same labour, and is obtained without any expense." He directs to make use of a common garden-pump for sprinkling trees with soap-suds, and says, if the water of a washing cannot be had, a quantity of pot-ash, dissolved in water, may be substituted, and that the washing of the trees with soap-suds twice a week, for three or four weeks, in the spring, will be sufficient to secure them from aphides, &c.

Other modes of counteracting the effects of insects are pointed out in treating of the plants which are most liable to be injured by them. We shall, however, make some remarks on a few of those which are most common and injurious to the interests of the cultivator.

Canker-worm.—We shall not attempt to give either a description or the natural history of the canker-worm, but refer to Professor Peck's Memoir on the subject, (which was originally published in the *Mass. Agricultural Repository* and republished in the *N. E. Farmer*, vol. v. p. 393,) and direct our attention, exclusively, to the remedies, which have been used or suggested to preserve fruit-trees from this formidable enemy.

The female of this insect comes out of the ground late in the fall, early in the spring, or, sometimes, during a peri-

od of mild, open weather, in winter. Those which rise in autumn or in winter are less numerous than those which ascend in spring; but, being very prolific, they do much injury. One method of preventing the ravages of the worm is to bar the ascent of the females up the stem of the tree. This has generally been attempted by *tarring;* of which there are several modifications :—

1. A strip of linen or canvass is put round the body of the tree, before the females begin their ascent, and well smeared with tar. The insects, in attempting to pass this barrier, stick fast, and perish. But this process, to complete the desired effect, must be commenced about the first of November, and the tarring continued, when the weather is mild enough to permit the worms to emerge from the ground, till the latter end of May, or till the time of their ascent is past. It is necessary to fill the crevices in the bark with clay mortar, before the strip of linen or canvass is put on, that the insects may not pass under it. Having put on the strip, which should be at least three inches wide, draw it close, fasten the ends together strongly, then tie a thumb-rope of tow round the tree, close to the lower edge of the strip. The design of this is to prevent the tar from running down the bark of the tree, which would injure it. It should be renewed, in moderate weather, once a day, without fail. The best time is soon after sunset, because the insects are wont to pass up in the evening, and the tar will not harden so much in the night as the day.

2. Another mode of tarring is to take two pretty wide pieces of board; plane them; make semi-circular notches in each, fitting them to the stem or body of the tree; and fasten them together securely at the ends, so that the most violent storms may not displace them. The crevices betwixt the boards and the tree may be easily stopped with rags or tow; then smear the under-sides of the boards with tar. The tar, being defended from the direct rays of the sun, will hold its tenacity the longer, and, therefore, need not be frequently renewed. The trees, in this way, will be less liable to be injured by the drippings of tar, by leaving a margin of two or three inches, on those parts of the boards which are next to the trees, to which no tar is applied.

3. Another mode of blockading the paths of the insects, in their ascent up the trees, is to enclose them with collars, or circular slips of tin. Of this method we have seen some notices, but no description. We presume, however, that

the pieces of tin are shaped, and fitted to the trees, somewhat like the boards above-mentioned, and perhaps, if the outer rims of the collars were curved, or bent downwards, they might present obstacles, which the worms could not pass, even if no tar was applied. We fear that this method would prove too expensive for general adoption, but would solicit further information on this subject from those who have a practical knowledge of its application and results.

4. Another method, proposed by Dr. Jeremiah Spofford, of Bradford. Mass., is, to spread mercurial ointment (*Unguentum hydrargyri*) upon strips of woollen cloth, or narrow lists, such as are cut from the edges of broadcloth, and apply them closely round the trees, having first made the bark smooth where it is not so, that none of the grubs, or females that deposit the eggs, from which the worms are produced, may pass under the band or strip, which contains the ointment. Dr. Spofford observes that "the advantages of using the unguentum over any mode in common use are obvious. While tar requires to be renewed every night, that it may catch and hold the grub, merely by its tenacity, this mode requires preparing but once a year, and will be growing stronger for a long time, by an increased oxidation of the mercury, when exposed to the air."—See *N. E. Farmer*, vol. iv. p. 377.

The *Mass. Agr. Repos.* vol. iii. No. 4, contains some remarks on the canker-worm, by the Hon. John Lowell, president of the Mass. Agr. Soc. from which the following is extracted:—

"I had the turf dug in around sixty apple-trees, and the earth laid smooth. I then took three hogsheads of *effete*, or air-slaked lime, and strewed it an inch thick round my trees, to the extent of two or three feet from the roots, so that the whole diameter of the opening was from four to six feet.

"I tarred these trees as well as the others, and, although I had worms or grubs on most that were not limed, I did not catch a single grub where the trees were limed.

"I do not speak with confidence. I am, however, strongly encouraged to believe the remedy perfect. It was ascertained by Professor Peck, that the insect seldom descended into the ground at a greater distance than three or four feet from the trunk, and to the depth of four inches, or that the greater part come within that distance. The lime is known to be destructive of all animal substances,

and I have little doubt that it actually decomposes and destroys the insect in the chrysalis state; at least I hope that this is the case.

"There are many reasons, which should encourage a repetition of this experiment. The digging round the trees is highly useful to them, while tarring is very injurious. The expense is not great. A man can dig round fifty trees in one day. The lime is a most salutary manure to the tree. After the spot has been once opened and limed, the labour of keeping it open will not be great. Three hogsheads of air-slaked lime, or the sweepings of a lime-store, will suffice for fifty trees, and will cost three dollars. As it is done but once a year, I think it cannot be half so expensive as tarring.

"I repeat it, that I mention my experiments with great diffidence, as being the first of my own knowledge. It may induce several persons to try it in different places, and where trees are surrounded with others, which are treated differently. All I pray is, that it may prove successful, and relieve us from this dreadful scourge, which defaces our country, while it impoverishes and disappoints the farmer."

The remedies proposed by Professor Peck were, 1st,—Turning up the ground carefully in October, as far as the branches of a tree extend, to half a spade's depth, or five inches, so as completely to invert the surface. A great number of chrysalids would thus be exposed to the air and sun, and of course destroyed. 2dly,—Breaking the clods, and smoothing the surface with a rake, and passing a heavy roller over it, so as to make it very hard, and without cracks. In grass-grounds, the sods should be turned with the grass-side down, and placed side by side, so as to be rolled. The winter's frosts would heave and crack a smooth surface, but it might be smoothed and hardened by the roller, or by other means, in March, with much less trouble, time, and expense, than rolling requires. As lime, when slaked, is reduced to an impalpable powder, and is thus well adapted to close the openings in the surface, Mr. P. was inclined to think its good effects are produced this way as well as by its caustic qualities.—*Thacher's Orchardist*, p. 93.

John Kenrick, Esq., of Newton, Mass., proposed, between the time in June after the worms had disappeared and the 20th of October, to take the whole of the soil surrounding the trees, to the extent at least of four feet from the trunk, and to a suitable depth, and cart it away to a distance from any trees, which the canker-worms are in the

habit of feeding on; and returning an equal quantity of compost, or rich earth, intermixed with manure.

A writer for the *New England Farmer*, vol. iii. p. 327, states a case of an orchard having been preserved from canker-worms, by means of a large number of locust-trees, equal to about double the number of apple-trees.

Mr. Roland Howard, of Easton, Mass., observes, (*N. E. Farmer*, vol. iv. p. 391,) that "A quantity of lime was collected from the sweepings of a lime-store, and spread on the ground around a certain apple-tree, some time in the month of November; (the foliage of which tree had been destroyed by the canker-worm the preceding summer;) the ground being in a pulverized state, the lime was spread as far from the trunk of the tree as the drippings from the branches extended: the effect was stated to be the entire disappearance of the worm, and an increased vigour of the tree." The same writer observes, that "moving the earth with a plough or hoe late in November, or beginning of December, has been found very efficacious in destroying them." This last mentioned remedy, if it will always prove efficient, will probably be the cheapest and most expedient. But the worm must be capable of enduring a considerable degree of cold, or unerring instinct would not lead it from its dormitory in November (as it frequently does) to brave the rigours of winter on the stem or branches of the tree. We are inclined to believe, as well as to hope, that the application of lime, as above stated, will prove effectual; and, if so, it will probably be preferable to any mode of applying tar, or attacking the enemy above ground.

When the insects have ascended, their numbers may be lessened by jarring or shaking the body or limbs of the tree, causing them to suspend themselves by the threads, which they spin from their bodies, and striking them off with a stick. It is said that those which thus fall to the earth do not rise again. Whether they would be able to resist the effects of a sprinkling with soap-suds, saline or bitter infusions, &c. is more than we can say; but we wish their powers might be tested by showering them with those mixtures, which are found to be the best antidotes against other insects.

CATERPILLAR.—"This is one of the worst enemies to an orchard, when neglected; but easily destroyed by a little attention. In the spring, when the nests are small, and the insects young and tender, they never venture

abroad in the early part of the day, when the dew is on the trees, or in bad weather; they may then be effectually destroyed by crushing them in the nest; this attention, continued a short time every spring, will destroy those in existence, and will prevent their increase in future years: if left till grown strong, they wander from their nests, and cannot be effectually overcome without great trouble and expense."—*Coxe on Fruit Trees.*

The Hon. Timothy Pickering, in a letter to the corresponding secretary of the Massachusetts Agricultural Society, has recommended an implement for the destruction of caterpillars. It is made by inserting some hog's bristles between twisted wires, in such manner as to form a cylindrical brush, which will present bristles on every side. This is attached to a pole of such length as the trees may require, and the caterpillars are brought down by it, and then crushed. Other methods have been proposed, such as casting over the tree a few handfuls of ashes, in the morning before the dew is dissipated from the foliage, or after a shower of rain. A strong whitewash of fresh stone-lime, applied by the means of a mop, or sponge fixed to the end of a pole, strong soap-suds, spirits of turpentine, a little oil of any kind, particularly blubber oil, are likewise fatal to the insects. But, perhaps, the most effectual remedy is the *hand*, by which the insects may easily be removed at an early stage; but if this be neglected, it is thought that the next best remedy is the use of Col. Pickering's brush as above. In applying either of these remedies, care must be taken to choose that part of the day, when the caterpillars are in their nests. They rarely quit them till nine o'clock, and generally return to them again about twelve.

Curculio.—This is a small bug, or beetle, which perforates the young fruit of the pear, apple, and all stone fruits, and deposits its eggs in them. The eggs soon hatch, and a small maggot is produced, which feeds either on the pulp of the fruit, or on the kernel of the seed; for the tastes and habits of the different species are not similar. In the stone fruits, this injury destroys their growth, and they fall with their little enemy within them. The insect retreats into the earth, and passes the winter in the chrysalis state, and comes forth just as the young fruit is forming, or the petals of the flowers are falling, to renew its mischievous labours. This insect continues its depredations from the first of May until autumn. Dr. James Tilton, of Wilmington, Delaware, in an article on this subject, published in the Ameri-

can editions of *Willich's Domestic Encyclopedia*, observes that "Our fruits, collectively estimated, must thereby be depreciated more than half their value;" and adds, in his directions for destroying the insect, "All the domestic animals, if well directed, contribute to this purpose. Hogs, in a special manner, are qualified for the work of extermination. In large orchards, care should be taken that the stock of hogs is sufficient to eat up all the early fruit which falls from May till August. This precaution will be more especially necessary in large peach orchards; for, otherwise, when the hogs become cloyed with the pulp of the peach, they will let it fall out of their mouths, and content themselves with the kernel, which they like better; and thus the curculio, escaping from their jaws, may hide under ground till next spring."

"The ordinary fowls of a farm-yard are great devourers of beetles. Poultry, in general, are regarded as carnivorous in the summer, and therefore cooped some time before they are eaten. Every body knows with what avidity ducks seize on the tumble-bug, (*Scarabæus carnifex*,) and it is probable the curculio is regarded, by all fowls, as an equally delicious morsel. Therefore it is that the smooth stone fruits, particularly, succeed much better in lanes and yards, where poultry run without restraint, than in gardens and other enclosures, where fowls are excluded."

Instead of turning swine into orchards, to pick up the fruit which falls, and thus destroy the worms which it contains, it will often be found most expedient to gather such fruit, and give it to swine in pens, &c., either raw, or, what would be better, boiled. If such measures were generally taken, with fruit which falls spontaneously, as to prevent the insects, which generally cause it to drop prematurely, from escaping into the ground, the worms, which destroy one half our fruit, and very much deteriorate a considerable part of the other half, would soon be extirpated from our orchards and fruit-gardens.

APHIS, PLANT-LOUSE, PUCERON, *or* VINE-FRETTER.—"This genus of insects comprises many species and varieties, which are denominated from the plants they infest. The males are winged, and the females without wings: they are viviparous, producing their young alive, in the spring; and also oviparous, laying eggs in autumn. Water, dashed with force from a syringe, [or garden engine,] will prove as destructive to them as any thing, when on trees; and smaller plants may be washed with lime-water, with tobac-

co-water, with elder leaves infused in water, or with common soap-suds, any of which will destroy the insects."—*Loudon.* "Tie up some flour of sulphur in a piece of muslin, or fine linen, and with this the leaves of young shoots or plants should be dusted, or it may be thrown on them by means of a common swan's-down puff, or even a dredging box. Sulphur has also been found to promote the health of plants, on which it was sprinkled, and that peach trees, in particular, were remarkably improved by it."—*Dom. Encyc.* "In green-houses they are readily destroyed by the smoke of tobacco, or of sulphur. But in the open air, fumigation, though much in vogue many years since, is of no avail. The best remedy is the simplest. Soap-suds, forcibly applied, will, after one or two applications, effectually destroy them, without apparent injury to the plant."—*Deane.*

A writer for the *New England Farmer*, vol. iii. p. 9, after stating a number of experiments with soap-suds, for destroying aphides, which were unsuccessful, or but partially succeeded, says, "I was led to conclude, that it is not sufficient to wet the upper side of the leaves, thinking to make them disagreeable or poisonous to the insect, but that they must be well drenched or immersed in the suds. I therefore applied again the same remedy; but with this difference,—instead of sprinkling the upper side of the branches, I carried a pailful of suds from tree to tree, and, bending the tops of small trees, and the branches of larger ones, immersed all the parts infested with lice, holding them in the liquor for a moment, that none might escape being well wet. On examining the trees the next day, the greater part of the lice were destroyed. It was found necessary to repeat the same process once or twice, with suds not too weak, say about two or three ounces of soap to a gallon of water." Another writer in the same paper, p. 10, says, "I have applied soap-suds to my apple-trees, in order to kill the lice. It will be sufficient for me to say, that just sprinkling them with suds will not kill them; neither will dipping the branches, which are infested with them, kill them. But dipping and holding them in as long as I can conveniently hold my breath, will destroy every one. The suds do not appear to injure the leaves. I tried suds made on purpose, and suds which had been used for family washing. The latter answers the purpose much the best." It is possible to make soap-suds so strong as to kill the tender branches, as well as the insects which infest them.

The proportion above-mentioned, of two or three ounces of soap to a gallon of water, is, probably, most advisable.

Cut-worm.—This is an ash-coloured worm, with a stripe almost black on its back. When fully grown it is about the size of a goose-quill, and about an inch and a quarter in length. They are very apt to cut off young cabbages, cauliflowers, beets, &c. They never voluntarily appear on the surface of the ground in the day time, but may be found about an inch below it. In the night they make their excursions, cut off the stems of young plants just at the top of the ground, and again bury themselves.

Dr. Deane observed, "I once prevented their depredations in my garden, by manuring the soil with sea-mud, newly taken from the flats. The plants generally escaped, though every one was cut off in a spot of ground that lies contiguous. From the success of this experiment, I conclude that salt is very offensive or pernicious to them. Lime and ashes, in some measure, prevent their doing mischief; but sea-water, salt, or brine, would be more effectual antidotes. The most effectual, and not a laborious remedy, even in field-culture, is to go round every morning, and open the earth at the foot of the plant, and you will never fail to find the worm at the root, within four inches. Kill him, and you will save not only the other plants of your field, but, probably, many thousands in future years."

There is some danger in making use of salt, brine, or sea-water, of injuring the plants in attempting to destroy insects; and we should, therefore, generally prefer decoctions of elder, walnut leaves, or tobacco. Mr. Preston, of Stockport, Penn., preserved his cabbage-plants from cut-worms, by wrapping a hickory-leaf round the stem, between the roots and leaves.—*N. E. Farmer*, vol. iii. p. 369. The Hon. Mr. Fiske, of Worcester, Mass., in speaking of this insect, says, "To search out the spoiler, and kill him, is the very best course; but, as his existence is not known except by his ravages, I make a fortress, for my plants, with paper, winding it conically and firmly above the root, and securing it by a low embankment of earth."—*N. E. Farmer*, vol. iv. p. 362.

Lice on apple-trees.—There is a species of insect infesting apple-trees, which may be styled the *bark-louse*, to distinguish it from the *plant-louse*, or *aphis*. It is, in form, like half a kernel of rye, but much smaller, with the flat side sticking to the bark of the tree. Jesse Buel, Esq., of Albany, gives the following statement of his mode of

destroying them:—"In June last, I observed directions in the *New England Farmer* for destroying the parasitic enemy; and, that being the particular time to make the application, I immediately set about it. For this purpose, I took eight parts of water and two of soft soap, and mixed with these lime enough to make a thick whitewash. With a whitewash and paint brush, I put this upon the trunks and limbs of trees, as high as was practicable, filling the cracks in the bark, and covering the whole surface. The effect has been not only to destroy most of the lice, but to give the trees an improved and vigorous appearance. The outer bark, which, from a stinted growth, had become rough and hard, has, in a measure, fallen off in flakes, and disclosed a soft, smooth bark, the sure indication of health."

E. Perley, Esq. published a description of this insect in the *Mass. Agr. Repos.* vol. iii. p. 114, and says, "The application which I have found most effectual is, washing the trees with lie or brine." He observes, that "they resemble blisters, and are near the colour of the bark of the tree. These blisters contain from ten to thirty nits or eggs each, in form like a snake's egg; which, in a common season, begin to hatch about the 25th of May, and finish about the 10th of June. These nits produce a white animalcule, resembling a louse, so small, that they are hardly perceptible by the naked eye; which, immediately after they are hatched, open a passage at the *end* of the blister, and crawl out on the bark of the tree, and there remain, with little motion, about ten days, when they stick themselves fast to the bark of the tree, and die. From this little carcass arises a small speck of *blue mould*, which is most plain to be seen between the 10th and 20th of June, and continues about fifteen days, and then gradually wears off until the old carcass appears, which, by this time, is formed into a new blister, and contains the spawns or nits beforementioned. These blisters prevent the circulation of the sap, and prove as fatal to the tree as the canker-worm."

"A correspondent of the Caledonian Horticultural Society recommends *clay paint* for the destruction of insects, and the mildew on fruit-trees. The instructions are, that you take a quantity of the most tenacious brown clay that can be obtained; diffuse among it as much soft water as will bring it to the consistence of cream or paint; pass it through a fine sieve, so that it may be made perfectly smooth and unctuous, and freed from any gritty particles. With a painter's brush, dipped in the clay paint, go carefully over

the whole tree, not excepting the young shoots. This aver, when it becomes dry, forms a hard crust, which enveloping the insects closely, completely destroys them, without doing the smallest injury either to the bark or buds."— *Thacher's Orchardist.* Solutions of potash and decoctions of tobacco are likewise recommended.

APPLE-TREE BORER.—*Saperda bivitata.*—The scientific description of this very pernicious insect is thus given by Professor Say, of Philadelphia:—"Hoary; above, light-brown, with two broad, white fillets. Inhabits the United States. *Body*, white; *eyes*, fuscous; a small spot on the vertex, and another behind each eye, light-brown; *antennæ*, moderate, slightly tinged with bluish; *thorax*, light-brown, with two broad, white lines, approaching before; *elytra*, light brown, irregularly punctured; a broad, white, longitudinal line on each, nearer to the suture than to the outer edge. Length, from one-half to seven tenths of an inch. A very pretty insect. In the larvæ state, it is very injurious to the apple-tree, boring into the wood."—*Journal of the Academy of Sciences, Phil.* vol. iii. p. 409.

Professor Say, in a letter to Jesse Buel, Esq., says, "You state, that it leaves the pupa, and becomes perfect in the latter part of April, and that the eggs are deposited beneath the surface of the soil. These two circumstances ascertained, I would recommend the application, early in May, or the latter part of April, of common bricklayer's mortar, around the base of the tree, so as to cover completely the part, and its immediate vicinity, where the deposit is made. This preventive was successfully employed by Mr. Shotwell, against the attacks of the peach-tree insect, (see *American Farmer*, vol. vi. p. 14,) and I see no reason why it should not be equally efficacious in the preservation of the apple-tree."—*Mem. of N. Y. Board of Agriculture*, vol. iii. p. 479.

The *Mass. Agr. Repos.* vol. v. p. 360, contains a paper on this insect, by John Prince, Esq., by which it appears that worms of this kind are got rid of by "digging round the tree, and clearing away the earth to the roots, and then, with a sharp-pointed knife, a chisel, or a gouge, (and a small wire to probe, if they are deep in the tree,) they may easily be destroyed." After taking out the worms, the wounds should be covered over with grafting-clay and a large proportion of dry wood-ashes mixed; and the earth then returned to the tree. The process for cleansing the trees from borers should be performed in the spring, as soon as

the frost is out of the ground, or at least before the month of June, as the perfect insect escapes before that time.

SLUG-WORM, *or* NAKED SNAIL.—These reptiles appear on the leaves of fruit-trees in the month of July. Professor Peck has ascertained that they are the progeny of a small black fly, which deposits its eggs in the leaf in the months of May and June. They may be destroyed by means of lime, sprinkled over the leaves in the form of powder. For this purpose, a wooden box, of convenient size, having its bottom perforated with numerous small holes, is to be filled with lime. This, being mounted on a pole, and shaken over the tree, distributes the lime among the leaves, and the slugs are immediately destroyed. The labour is very trivial; a man may cover a large tree in three or four minutes; and the desired effect is certain. Fine earth, shaken through a basket or perforated box, will answer as well.

"Another remedy, it is said, will prove equally effectual. It is a strong infusion of tar, made by pouring water on tar, and suffering it to stand two or three days, when it becomes strongly impregnated. This, if sprinkled over the leaves by means of an engine, will kill these vermin instantaneously. A strong decoction of tobacco will probably produce the desired effect, and tanners' bark, put round the tree, it is said, will have a salutary tendency as a preventive."—*Thacher's Orchardist.*

Forsyth recommends watering the ground, where these insects are, with soap-suds and urine, mixed with tobacco-water. Ducks, admitted into a garden, will destroy all within their reach.

WIRE-WORM, *or* RED-WORM.—This insect is slender, and usually about an inch long, with a hard coat, and a pointed head. Mr. William Moody, of Saco, (Maine,) in a communication to Hon. Josiah Quincy, published in *Mass. Agr. Repos.* vol. iv. p. 353, observes, "I am persuaded, from experience, that sea-sand, put under corn or potatoes with manure, or spread on the land, will go far, if not wholly, to the total destruction of these destructive worms, on which nothing else seems to have any effect. It has a beneficial effect spread on land before ploughing, or even after land is planted with corn or potatoes, not only to destroy the wire-worm and other insects, but to increase the crop. With my neighbours a load of sea-sand is considered as preferable to a load of the best manure, to mix in with

their common barn-manure, or to spread on their gardens and low flat land."

Probably sea-mud or sea-water would produce good effects as preservatives against this and other insects.

A correspondent of the *New England Farmer*, vol. iv. p. 284, recommends, from actual experiment, the soaking of seed-corn in a solution of copperas, to preserve it against the wire-worm, other insects, and birds. He says, "The plan which I pursued was as follows:—I used about one and a half pound of copperas in three pecks of corn. I made the water warm, and soaked the corn full forty-eight hours before planting, putting in corn and copperas as we used it out. It is not easy to use too much copperas; I believe the more the better." This method has been frequently and successfully put in practice. See *N. E. Farmer*, vol. v. p. 310.

The STRIPED BUG, *or* YELLOW FLY.—This is a small insect of the *coleoptera* order, or such as have *crustaceous elytra*, or wing cases, like the beetle. The elytra of this bug are striped with yellow and black. They prey on the young plants of cucumbers, melons, squashes, and others of the *cucurbitaceæ* species. "These insects may be considerably thinned by killing them in a dewy morning, when they have not the free use of their wings, and cannot well escape. But nothing that I have tried has proved so effectual as sifting or sprinkling powdered soot upon the plants when the morning dew remains on them. This forms a bitter covering for the plants, which the bugs cannot endure the taste of."—*Deane.* "We would recommend sprinkling the plants with a little sulphur or Scotch snuff."—*Farmer's Assistant.* But the surest defence against these insects is, enclosing the plants with a frame, and a muslin or gauze covering, as recommended page 91.

JERUSALEM ARTICHOKE.—*Helianthus tuberosus.*—The Jerusalem artichoke is a hardy perennial, a native of Brazil, and is of the same genus as the sun-flower. It is propagated and cultivated like the potato. We have been informed that this root will grow and produce a profitable crop on poor land, and *without manure;* though, with deep ploughing and good manuring, its culture would probably be attended with greater profit. It was much esteemed before potatoes were known. The epithet *Jerusalem* is a corruption of the Italian word *Girasole* (from *girare*, to turn, and *sol*) or sun-flower; the name *arti-*

choke is bestowed from the resemblance in flavour, which the roots have to the bottoms of artichokes. It is superior to the potato in being more hardy, and not liable to be injured by frost; but we believe it contains somewhat less nutritive matter. Its tops are large, and may make a valuable addition to the farm-yard, of a substance which may be converted into manure. From the circumstances of its flourishing in a poor soil, and producing large leaves and stalks, there can be no doubt that it derives much food for plants from the atmosphere, which by its decay is imparted to the soil on which it grows, or on which, after rotting, it is spread as manure. There is no plant which more completely shades the ground, and it must in that way enrich it. It will flourish in the shade of trees, buildings, &c. where other plants will not thrive. We believe there are thousands of acres of land in the more populous parts of the United States, which are now considered as not worth cultivation, which would produce considerable quantities of the Jerusalem artichoke, with no other trouble than *once* planting, and digging the roots from time to time as they are wanted.

Dr. Darwin says that the Jerusalem artichoke will not ripen its seeds in Great Britain, (and we do not believe it will in New England,) by being suffered to grow in the open air under ordinary cultivation. But by forcing the plant in pots, hot-houses, &c., perhaps seeds might be obtained. This would, probably, be desirable, for it is supposed that all plants degenerate if propagated merely by slips, roots, cuttings, &c., without having recourse to seeds. Potatoes should be renewed from the seed, at least once in twelve or fourteen years, or they will degenerate; and probably Jerusalem artichokes might become more valuable by the same means. Planting large and fair roots, with suitable soil and culture, will retard this degeneracy, but, we believe, not wholly prevent it.

"*Use.*—The roots are esteemed a wholesome, nutritious food, and are eaten boiled, mashed with butter, or baked in pies, and have an excellent flavour. Planted in rows from east to west, the upright herb of the plant affords a salutary shade to such culinary vegetables as require it in the mid-summer months, as lettuce, turnips, strawberries, &c."—*Loudon.*

The second volume of *Memoirs of the New York Board of Agriculture* contains remarks on this root by Levi McKean, of Dutchess, in which he gives it as his opinion that arti-

chokes are the best suited for cultivation in this climate as a crop for hogs, sheep, and dairies, of any article that we have yet tried; and, besides the use of this crop for stock, which many writers consider to be equal to potatoes, they are also recommended highly as an article of human diet. It is true that, when boiled, they do not possess that peculiar farinaceous quality, that is so much esteemed in the best sorts of potatoes; but it is said that, when roasted, they are a very delicate article for the table, their taste then resembling the ground-nut of this country.

The only objection we have heard stated to this vegetable as an article of field-culture is, that, when once suffered to enter, it will take exclusive possession of a soil; and thus, when a change of crops is desired, becomes a most troublesome weed. But by turning in a sufficient number of hogs, the artichokes may be entirely eradicated; and, probably, a poor soil, which would answer no other purpose of culture, might be planted with the Jerusalem artichoke, and converted into a permanent pasture for swine. If not overstocked with the animals, the plants would keep possession of the soil, which they would meliorate; and when it should be wished to change the crop, turn in hogs enough to root out the artichokes.

LANDSCAPES *and* PICTURESQUE GARDENS.—The following article was written expressly for this work, by Mr. A. Parmentier, of New York, a French horticulturist of much taste and science:—

It has been reserved for the good taste of our age to make many advantageous changes in the embellishment of gardens, and to reinstate Nature in the possession of those rights from which she has too long been banished by an undue regard to symmetry.

Our ancestors gave to every part of a garden all the exactness of *geometric* forms: they seem to have known of no other way to plant trees, except in straight lines; a system totally ruinous to the beauty of the prospect. We now see how ridiculous it was, except in the public gardens of the city, to apply the rules of architecture to the embellishment of gardens.

The majestic trunk is now allowed the liberty of displaying its form, or of following in its vigorous shoots the plan of nature. Gardens are now treated like landscapes, the charms of which are not to be improved by any rules of art.

The advantages of these changes are so manifest, and

so well appreciated, that further proofs seem unnecessary. For where can we find an individual, sensible to the beauties and charms of nature, who would prefer a *symmetric* garden to one in modern taste; who would not prefer to walk in a plantation irregular and picturesque, rather than in those straight and monotonous alleys, bordered with mournful box, the resort of noxious insects?

Where is the person, gifted with any taste, who would not choose those alleys that wind without constraint, in preference to those dull straight lines which can be measured by one glance of the eye, and the monotony of which is unvaried? Instead of this, the modern style presents to you a constant change of scene, perfectly in accordance with the desires of a man who loves, as he continues his walk, to have new objects laid open to his view. To understand this style of a garden requires a quick perception of the beauties of a landscape, without which the existing plantation might be destroyed, instead of being used. Limited prospects, and neighbouring houses and buildings not worthy of notice, should be concealed, and the view left open to those objects which strike the eye of the beholder agreeably. The front of the house ought always to be *uncovered*, the principal point of view seen, or conjectured. A vast idea of the proprietor should be given, and this can only be done by a grand plan, in which nothing niggardly is to be seen.

Rows of trees should never be planted in front of the house, particularly when the house has been built in good taste, and at great expense. It may be objected to this, that the shade is wanted, and this I would not exclude; but, instead of one row in front, I would plant thick groups of trees on the three other sides, and leave the front open to public view; otherwise the taste and expense are, in a great measure, thrown away.

When you choose the situation of a country-house, let it be at some distance from the public road, so that the road which leads to it may give a good idea of the extent of the proprietor's domains, and care should be taken that the road is proportioned to this extent. It ought to be from eight to ten feet wide, so that carriages may pass, and gently serpentine. This winding should have a reason—that is to say—some groups of trees should be so placed as to appear to be the cause of it: for naturally the road would have led directly to the house, but the person walking, when he observes these groups of trees, will see at once why it

does not. Besides, he will be agreeably amused by the variety of views which will show to advantage the manner in which the artist has executed his plan, and the choice he has made of a situation.

If the house is placed on an eminence or side-hill, the prospect will be much more beautiful if you can enjoy the view of water: and, to add to the whole effect, and facilitate the labours of the artist, it is desirable that a grass-plot should naturally present itself.

The plantations and groups of trees near the house should be, if possible, of a deeper green;—they would extend the view and the perspective, and produce the effect of shades in a landscape-picture, where the groups of trees in front are of a darker shade, and seem to remove the perspective from the extremity of the landscape. For the same reason, the trees at the farther part of a park, or garden, should be those of a thin and light foliage.

Plantations should consist of, besides merely ornamental trees, those fruit-trees which are high and of bright foliage. Their flowers in spring, and branches loaded with fruit in autumn, make them objects of great beauty and interest.

The apple-tree alone, on account of its horizontal branches, should be confined to the orchard, where its useful products are ornamental and valuable. The most should be made of the agreeable and interesting views which may be had in the neighbouring landscape. They may be made useful to the general plan by being represented as the property of the proprietor.

For this reason, I highly approve of blind fences, and live hedges. But fences, necessary as enclosures, should be concealed so as not to appear as boundaries to the establishment, and present to the eye a disagreeable interruption in the prospect. The judicious use of hermitages, arbours, cottages and rotundas will add to the effect, in picturesque gardens and ornamented farms. If you use these ornaments, place the hermitage in some retired spot: a small rivulet would be an appropriate and beautiful accompaniment. The rustic arbour and cottage may occupy a place less secluded. An elegant rotunda should be seen from a distance, and on a hill or eminence. It should make a part of the establishment of a wealthy man, as well as pagodas, turrets, and Chinese towers. These ornaments are so expensive, that they are beyond the means of most persons: but hermitages, arbours and cottages may generally be afforded, as there is little expense in their construction.

Rustic bridges are very pretty where there is a stream, and they can be made of use; but they have no pretensions as mere accompaniments to a plantation. Obelisks, columns, &c. should be placed on elevated places.

As to tombs and cemeteries, I should wish to banish them entirely from gardens. They always awaken melancholy reflections in old people, for they remind them of their approaching end; and a regard for their feelings should, I think, exclude from their places of resort every object which could have such an effect.

Whilst on this subject, I will mention an anecdote of the celebrated Kent, architect of the English gardens, which will show to what extent this mania may be carried. He built a tomb in a park, and, to make the place still more gloomy, planted around it dead and mutilated trees; but, notwithstanding the celebrity he had acquired, he was loaded with ridicule, and forced to displace the trees.

LAVENDER.—*Lavandula spica.*—The lavender is a hardy under shrub, a native of the south of Europe. The plant rises two to four feet in height, with hoary, linear leaves, slightly rolled back at the edges: the flowers form terminating spikes of a blue colour, and appear from July to September. The leaves and flowers are powerfully aromatic.

"*Propagation and culture.*—It is propagated by cuttings and slips, like rosemary; it likes a dry soil, and may be planted either in distinct plants, two feet asunder, or to form a sort of hedge row, in one or more lines, especially where large supplies of flowers are required for distilling. The plants will advance in a close, branchy growth, from a foot and a half to two feet high, or more; and, when established, will produce plenty of flowers in July and August. Gather them while in perfection, cutting the spikes off close to the stem. Then give the plants occasional trimming, cutting off the gross and rampant shoots of the year, and the decayed flower-spikes." Neill observes, "If lavender be planted in a dry, gravelly, or poor soil, its flowers have a powerful odour, and the severity of our winters has little effect on it; while, in a rich garden soil, though it grows strongly, it is apt to be killed, and the flowers have less perfume."

"*Use.*—It is rather a medicinal plant than one used in cookery; though a few plants are kept in every garden. Imitation scent-bottles are made, by the ladies, of its fragrant spikes. They are also put in paper bags, and placed among linen to perfume it. Lavender-water, a well-known

perfume, is distilled from the flowers; for which purpose the plant is extensively cultivated in different places."—*Loudon.*

LAYERS.—Layers, in horticulture, denote certain tender shoots or sprigs of trees, which are buried in the ground till they have taken root, when they are separated from the parent stock, and become distinct plants. The operation of layering should be commenced before the ascent of the sap, or delayed till the sap is fully up, to wit, early in spring, or in mid-summer. The shoot intended to become a new plant, is half separated from the parent plant, at a few inches from its extremity. If the cut or notch does not penetrate at least half way through, some sorts of trees will not form a nucleus the first season; on the other hand, if the notch be cut nearly through the shoot, a sufficiency of alburnum, or sap-wood, is not left for the ascent of the sap, and the shoot dies. In delicate sorts, it is not sufficient to cut a notch merely, because, in that case, the descending sap, instead of throwing out granulated matter, in the upper side of the wound, would descend by the entire side of the shoot; therefore, besides a notch formed by cutting out a portion of bark and wood, the notched side is slit up at least one inch, separating it by a bit of twig, or small splinter of stone or potsherd.

Mr. Armstrong says, (*Mem. of N. Y. Board of Agr.* vol. iii. p. 15,) "This mode was probably suggested by observing the habits peculiar to some trees and shrubs, (as the laurel and the currant,) of pointing their branches to the earth; where, finding an habitual moisture, they strike root, and become distinct plants. In imitating this natural process, the artist notches the lower side of the branch, buries this in the earth, three or four inches deep, and keeps it down by a wooden crotchet. As this is done before the descent of the sap, the notch operates like a dam or obstruction to the descending juices, and forces them into a bulbous form, and granular substance, whence are emitted a mass of roots, necessary to the infant plant. When these are sufficiently formed, that part of the branch which binds them to the stem is severed, and the layer taken up and transplanted." For further particulars respecting the manipulation, &c., in this mode of propagation, see *Encyc. of Gardening*, pp. 388, 389.

LEAVES.—The leaves of trees, particularly of oak, may be employed advantageously to form hot-beds. Speechly, an eminent English gardener, gives the following account of his mode of using them:—

"After being raked into heaps, they should immediately be carried to some place near the hot-house, where they must lie to couch. I generally fence them round with charcoal hurdles, or any thing else, to keep them from being blown about the garden in windy weather. In this place we tread them well, and water them, in case they happen to have been brought in dry. We make the heap six or seven feet in thickness, covering it over with old mats, or any thing else, to prevent the upper leaves from being blown away. In a few days the heap will come to a strong heat. For the first year or two that I used these leaves, I did not continue them in the heap longer than ten days or a fortnight; but in this I discovered a considerable inconvenience, as they settled so much, when got into the hot-house, as soon to require a supply. Taught by experience, I now let them remain in the heap for five or six weeks, by which time they are properly prepared for the hot-house. In getting them into the pine pits, if they appear dry, we water them again, treading them in layers exceedingly well, till the pits are quite full. We then cover the whole with tan, to the thickness of two inches, and tread it well, till the surface becomes smooth and even. On this we place the pine pots, in the manner they are to stand, beginning with the middle row first, and filling up the spaces between the pots with tan. In like manner we proceed to the next row, till the whole is finished; and this operation is performed in the same manner as when tan only is used.

"Thus prepared, they will continue a constant and regular heat for twelve months, without either stirring or turning; and, if I may form a judgment from their appearance when taken out, (being always entire and perfect,) it is probable they would continue their heat through a second year." After some further details, the same writer observes, "I believe that oak leaves are preferable to those of any other sort; but I have found, by repeated trials, that the leaves of beech, Spanish chestnut, and hornbeam, will answer the purpose very well. It seems that all leaves of a hard and firm texture are very proper; but soft leaves, that soon decay, such as lime, sycamore, ash, and those of fruit-trees in general, are very unfit for this mode of practice."

The superiority of oak leaves as a material for hot-beds, according to this writer, consists in the following particulars:—"They always heat regularly; for, during the whole time that I have used them, which is near twenty-five years, I never once knew their heating with violence."

"The heat of oak leaves is constant; whereas tanners' bark generally turns cold in a very short time, after its furious heat is gone off." "There is a saving in point of expense; and decayed leaves make good manure; whereas, rotten tan is experimentally found to be of no value."

"Leaves mixed with dung," says Loudon, "make excellent hot-beds; and beds compounded in this manner preserve their heat much longer than when made entirely with dung. In both cases, the application of leaves will be a considerable saving of dung," &c.

LEEK.—*Allium porrum.*—The leek is a hardy biennial, a native of Switzerland. The stem rises three feet, and is leafy at bottom; the leaves an inch wide.

The *varieties* are,

The narrow-leaved, or Flanders leek;
The Scotch, or flag, or Musselburgh leek;
The broad-leaved, or tall, London leek.

Propagation.—"From seed; and, for a bed four feet wide by eight in length, one ounce is requisite."

Soil and site.—"The soil should be light and rich, lying on a dry sub-soil. A rank soil does not suit it, so that, when manure is necessary, well reduced dung, mixed with road drift, is better than dung alone. The situation should be open. Let the ground be dug in the previous autumn, ready for sowing in the spring. For the principal crop allot beds four or five feet wide, and sow in drills, about sixteen inches apart. A small crop may be sown thinly with a main crop of onions, and when the latter are drawn off, the leeks will have room for full growth."

Times of sowing.—"A small first crop may be sown as soon as the ground is dry enough, and the weather sufficiently mild in the spring. The principal crop should be sown the last of April or the beginning of May."

Course of culture.—"When the plants are three or four inches high, weed them clean, and thin them where too much crowded. Water well in dry, hot weather. The leek is much improved in size by transplanting; and those designed for that purpose will be fit to remove when from six to ten inches high. For this purpose, take out a quantity, regularly, from the seed-bed, either in showery weather, or after watering the ground. Trim the long, weak tops of the leaves, and the roots and fibres, and plant them by dibble, in rows, from nine to twelve inches asunder, by six or eight inches in the row, inserting them nearly down to the leaves, or with the neck part mostly into the ground,

to whiten it a proportionate length. Press the earth to the fibres with the dibber, but leave the stem as loose as possible, and, as it were, standing in the centre of a hollow cylinder. Give water if the weather be dry. Those remaining in the seed-bed thin to six or eight inches distance. Keep the whole clear from weeds. In hoeing, loosen the ground about the plants, to promote their free, vigorous growth. Some plant in hollow drills, and earth up, as in celery culture, which produces very large stems."

To save seed.—"Transplant some best, full plants, early in the spring, in a sunny situation, or in a row near a south fence. They will shoot in summer, in single, tall seed-stalks. Support them, as necessary, with stakes; and they will produce ripe seed in September. Cut the ripe heads with part of the stalk to each; tie two or three together, and hang up under cover, to dry and harden the seed thoroughly, when it may be rubbed out, cleaned, and put by for future service."—*Abercrombie.*

Use.—"The whole plant is used in soups and stews; but the blanched stem is most esteemed. Leeks formerly constituted an ingredient in the dish called *porridge*, which some suppose to be derived from the Latin *porrum*."—*Loudon.*

"The leaves of this plant possess a flavour similar to that of onions; affording a constant dish at the table of the Egyptians, who chop them up small, and eat them with their meat. They are also in great esteem among the Welsh; and their general utility, as a wholesome pot-herb, renders them a valuable culinary spice."—*Willich.*

LETTUCE.—*Lactuca sativa.*—Lettuce is a hardy, annual plant, introduced or cultivated in England in 1562, but from what quarter is not known.

Varieties.—These are very numerous; and, from their names, many of them appear to have come originally from the Greek Islands, and the coast of the Levant. Those mentioned in Mr. Russell's Catalogue are,

Early curled Silesia,	Grand admiral, (*large, fine cabbage,*)
Large green-head, or cabbage,	Tennis-ball, or rose,
Royal cape, (*superior quality,*)	Magnum bonum Cos,
India Lettuce, (*fine,*)	Brighton Cos,
Imperial cabbage,	Ice Cos,
Hardy green,	White Cos, or loaf,
Brown Dutch cabbage,	Green Cos.

Estimate of sorts.—The cabbage lettuces are round-leaved, growing in a compact, full head, of squat form, close to the ground. All the Cos lettuces, in their general growth, are more or less upright, of an oblong shape. Both kinds have

white, close, firm heads, when in perfection; the varieties reach maturity from June till September. Meanwhile, they are occasionally used in young, open growth. In a very young state, the cabbage-lettuces have a milder, more agreeable taste than the Cos; but when both classes are full grown, the flavour of the Cos is preferred for salads, while the cabbage kinds are more used for soups.

Propagation.—From seed, of which, for a seed-bed four feet wide by ten feet in length, a quarter of an ounce is sufficient, and will produce upwards of four hundred plants.

Soil and situation.—"All the sorts grow freely on any rich, mellow soil, where the sub-soil is dry. For the most part, raise this vegetable as a principal crop, on beds set apart for it, and keep the varieties separate; but to multiply the supplies throughout summer, portions may be sown, thinly intermixed with principal crops of leeks, onions, carrots, and spinnage, which will come off before the lettuces are full grown; also with any young perennials, which stand at wide intervals."

Times of sowing.—To obtain a constant supply of good lettuce, it is serviceable to sow every month, from February (or the opening of spring) to July, for the main summer and autumn crops. For late autumn crops, you may sow in August, and if you have hot-beds, frames, &c. you may sow in September, and so on, through the fall and winter. Early spring lettuce may be sowed so late in the fall as not to come up till spring.

Process of sowing.—Abercrombie says, "The ground should have been broken in the previous digging. Sow broad-cast, moderately thin; rake in lightly, and very even." Others direct to sow in drills, from a foot to sixteen inches apart. Armstrong observes, that "the straight-leafed sort is best cultivated in broad-cast, and does not require transplanting; but that the curled and head-lettuce cannot succeed without it."

Management of the summer crop.—"In the successive crops, raised from the opening of spring till the close of summer, when the plants reach about two, three, or four inches' growth, they should be thinned; of those removed, let a requisite number be planted out, from a foot to fifteen inches asunder, to remain for cabbaging. Such as continue in the seed-beds may be either gathered thinningly, in progressive stages, till the final reserve advance in close-heading; or, as they increase in size, be planted out at the square distance mentioned above, especially those designed

to stand till of stocky growth. In dry weather, water well at transplanting; also weed and hoe the beds thinned, and water them, if necessary. In the first heading-crop of Cos lettuces, when about three parts grown, and beginning to close the inner leaves, a number may be forwarded in cabbaging, by tying the leaves together, moderately close, with strings of bass; the remainder will head and whiten in due time, without this assistance.

Crop raised on heat.—"For an accelerated crop, some may be sown in the beginning or middle of February, on a gentle hot-bed. When the plants are one or two inches high, in March or April, prick a portion either into a warm border, if a mild season, and let them be shielded with mats, during nights and bad weather; or into a frame or slender hot-bed, to bring them more forward. According to their progress in April or May, transplant them into the open garden, from six to twelve inches asunder, to remain for heading."

To save seed.—"Leave or transplant either some of the early winter-standing plants, in March or April, or of the forwardest spring-sown crops, in May, or the beginning of June, fifteen inches asunder. They will produce ripe seed in August or September."—*Abercrombie.*

Use.—The use of lettuce, as a cooling and agreeable salad, is well known; it is also a useful ingredient in soups. It has medical properties, similar to those of opium. The refuse leaves are said to be good food for geese, ducks, and swine.

LOCUST-TREE.—*Robinia pseudo-acacia.*—This tree is a native of the United States.

Method of cultivation.—"It is capable of being raised from the seed, cuttings, layers and suckers; but the seed method is said to afford the best plants. The seeds should be sown about the end of March, or beginning of the following month, on a bed of light mould, being covered to the depth of about half an inch. The plants usually appear in the course of six or eight weeks. They should be well weeded and watered, and, when sufficiently strong, should be set out in the spring, or autumn, in nursery rows, for two or three years, in order to remain to have a proper growth for final planting."—*Rees' Cyclopedia.*

Dr. Drown, of Rhode Island, says, that "The easiest method of raising the locust is as follows:—Plant fifteen or twenty trees on an acre; and, when fifteen or twenty feet high, run straggling furrows through the ground, and,

wherever the roots are cut with the plough, new trees will start up, and will soon stock the ground with a plentiful growth."

Use.—It is observed in the *North American Sylva*, a celebrated work, by F. Andrew Michaux, that "The greatest consumption of locust wood is for posts, which are employed in preference for the enclosing of court-yards, gardens and farms, in the districts where the tree abounds, and the circumjacent country. They are transported for the same use to Lancaster, Baltimore, Washington, Alexandria, and the vicinity.—When the trees are felled in the winter, while the circulation of the sap is suspended, and these posts are allowed to become perfectly dry before they are set, they are estimated to last forty years. Experience has shown that their duration varies according to certain differences in the trees from which they are formed: thus about Lancaster, and at Harrisburgh, a small town on the Susquehannah, where a considerable trade is carried on in wood that is brought down the river, those trees are reputed the best whose heart is red; the next in esteem are those with a greenish-yellow heart; and the least valuable are those with a white heart. From this variety in the colour of the wood, which, probably, arises from a difference of soil, are derived the names of *red*, *green*, and *white* locust. In the Western States, there is a variety which is sometimes called *black* locust."

It is probable, that the locust with a "greenish-yellow heart," spoken of by M. Michaux is the same with that which Mr. Briggs calls the *yellow* locust; and although M. Michaux supposes "this variety in the colour of the wood probably arises from a difference of soil," it is not impossible that there may be permanent specific differences in the several varieties. If so, the discovery is of importance.

M. Michaux says, "In naval architecture, the shipwrights use as much locust-wood as they can procure. It is as durable as the live oak and the red cedar, with the advantage of being stronger than the one, and lighter than the other."

With regard to the insect which destroys the locust, M. Michaux says, "Within eighteen or twenty years, an obstacle has unhappily appeared, which will contribute greatly to prevent the multiplication of the locust in all the anciently settled parts of the United States; this is a winged insect, which attacks the tree while standing, penetrates

through the bark into the centre of the trunk, and, for the space of a foot, mines it in every direction, so that it is easily broken by the wind. This inconvenience is already so serious, as to induce many people to forego all attempts to form plantations of locust. In Virginia, I have not learned that trees of the natural growth have been visited by this destroyer, but those that have been reared about the plantations have already felt its ravages. This evil, which it appears difficult to remedy, will be more sensibly felt when the destruction of the forests now on foot, an inevitable consequence of the neglect of all measures of preservation, shall force the inhabitants to have recourse to plantations, which they will wish to form, in a certain proportion, of the locust. Hence it may result, that, disappearing successively from the American forests, by constant consumption, and not being reproduced on account of the insect, the locusts will become extremely rare in their native country, and abundant in Europe, where no similar catastrophe forbids their propagation."

The *Massachusetts Society for the Promotion of Agriculture* have offered a premium of fifty dollars "for a mode of ex tirpating the worm that attacks the locust-tree, which shall appear to the satisfaction of the trustees to be effectual."

The following, copied from a report of a committee of the *Essex Agricultural Society*, on farms in Essex county, Mass., (published in the *N. E. Farmer*, vol. iii. p. 145,) places the advantages to be anticipated from the culture of the locust in a fair, and, we believe, just point of view.

"A practical illustration of the advantages of cultivating the locust tree presented itself on the farm of Dr. Nichols. Several acres, that were, a few years since, barren and gravelly pastures, are now covered with a good coat of grass, almost entirely by reason of planting and permitting a growth of locust trees upon the land. This is easily done, after a few trees have taken root, either from the seed, or by being transplanted, and taking care that horned cattle do not go upon the land while the trees are young. In addition to the increase of feed, the trees themselves are well worthy of cultivation. No growth is more rapid, and none more in demand, or of greater value when arrived at maturity. It may be doubted whether an acre of land can be made to yield more in the course of twenty-five or thirty years, without the application of any manure, than by planting it with locust-trees. On a fair computation, the number of serviceable posts that might be obtained in this time

would be from three to six hundred, worth from fifty cents to one dollar each. The increase of feed and surplus wood would fully pay the labour of cultivation; so that the proceeds of the timber would be the profits of the land.

"An objection to the cultivation of the locust-tree is often brought from the fact that they are sometimes destroyed by worms. This is true; but the ravages of this insect are found to be greatest where the trees are few and scattered. In the grove on this farm, which extends over a number of acres, and in the other groves in the vicinity, but very few of the trees are at all injured by worms. This objection is by no means sufficient to authorize the neglect of their cultivation. It certainly is of the highest importance to the farmers of Essex, to inquire how they can improve their pastures; or, rather, how they can save them from ruin; for it must be obvious to all, that, as at present managed, they are constantly growing worse, and many of them have already become of very little value. If, by planting them with trees, by ploughing, by applying plaster, as has been done, with good success, on the farm of Mr. Bartlett, or in any other way, they can be reclaimed, it surely is worthy of the experiment."

LOVE-APPLE.—*See* TOMATO.

MADDER.—*Rubia tinctoria.*—The following directions for raising this plant are copied from *The Emporium of Arts:*

"This plant may be propagated either by offsets or seeds. If the latter method is preferred, the seed should be of the true Turkish kind, which is called *Lizari*, in the Levant. On a light, thin soil, the culture cannot be carried on to any great profit. The soil in which the plant delights is a rich, sandy loam, being three feet in depth, or more.

"The ground, being first made smooth, is divided into beds four feet wide, with alternate alleys half as wide again as the beds. The reason of this extraordinary breadth of the alleys will presently appear. In each alley is to be a shallow channel for the convenience of irrigating the whole fields, &c. That part of the alley which is not occupied may be sown with legumes.

"The madder seed is sown broad-cast, in the proportion of from twenty-five to thirty pounds per acre, about the end of April. In a fortnight or three weeks, the young plants begin to appear; and from this time to the month of September, care must be taken to keep the ground well watered, and free from weeds.

'If the plants are examined in autumn, they will be

found surrounded with small yellow offsets, at the depth of two inches; and early in September, the earth from the alleys is to be dug out, and laid over the plants of madder, to the height of two or three inches. With this, the first year's operation ceases.

"The second year's work begins in May, with giving the beds a thorough weeding; and care must be taken to supply them with plenty of water during the summer. In September, the first crop of seed will be ripe; at which time the stems of the plants may be mown down, and the roots covered a few inches with earth, taken as before out of the alleys.

"The weeding should take place as early as possible in the spring of the third year; and the crop, instead of being left for seed, may be cut three times, during summer, for green fodder, all kinds of cattle being remarkably fond of it.

"In October, the roots are taken up, the offsets carefully separated, and immediately used to form a new plantation; and the roots, after being dried, are sold, either without further preparation, or ground to a coarse powder, and sprinkled with an alkaline lie.

"The roots lose four fifths of their weight in drying; and the produce of an acre is about two thousand pounds weight of dry, saleable madder."

"Madder usually sells for about thirty-two dollars per hundred; so that the produce of an acre, as above stated, would amount to six hundred and forty dollars."—*Farmer's Assistant.*

MANGEL WURTZEL.—*See* BEET.

MARJORAM ORIGANUM.—Of this herb there are four different species cultivated; the *pot*, *sweet*, *winter*, and *common*.

POT MARJORAM—*O. onites*—is a hardy, perennial, under shrub, a native of Italy. The stem rises more than a foot high, and is covered with spreading hairs; the leaves are small and acute, almost sessile, and downy on both sides. It is in flower from July to November, and is propagated from seed, but chiefly from rooted slips.

SWEET MARJORAM—*O. marjorana*—is a hardy biennial, a native of Portugal. It resembles the *O. Onites*, but the leaves have distinct petioles, and the flowers, which appear in June and July, are collected in small, close heads; and hence it is often called *knotted marjoram*. When in blossom, the herb is cut over, and dried for winter use, so that a sowing requires to be made every year.

The WINTER SWEET MARJORAM is the *O. Heracleaticum*, a hardy perennial, a native of Greece. The leaves of this species resemble those of *O. marjorana;* but the flowers come in spikes. It flowers from June to November, requires a sheltered, dry soil, and, seldom ripening its seeds, is propagated by slips and cuttings.

The COMMON MARJORAM is the *O. vulgare*, a native of Britain. It bears a considerable resemblance to the last named species. The flowers arise in sub-rotund panicles, in smooth, coloured spikes, of a reddish appearance, in July and August. This species is only used in cookery, in default of the others.

Culture.—The three first species prefer a light, dry soil; the other a calcareous soil and shady situation. For a seed-bed, three feet by three feet, a quarter of an ounce of seed is sufficient. Sow in April, on a compartment of light earth, either in small drills, or broad-cast; or, sow a portion in a hot-bed, if requisite to have a small crop forwarded. When the plants are one, two, or three inches high, thin the seed-beds, and plant those thinned out in a final bed, six inches apart, giving water; or, where larger supplies are required, some may remain thick where sown, to be drawn off by the root as wanted. The *pot*, *winter*, and *common marjoram* may be propagated from offsets, by parting the roots in spring and autumn. Plant in rows in beds, allowing a square foot for each plant.

Gather the tops of all the sorts as wanted for summer use; and when in full blossom, in July or August, for preservation through the winter.

Use.—All the species, but especially the three first, are aromatics, of sweet flavour, much used as relishing herbs in soups, broths, stuffings, &c. The young, tender tops and leaves together, are used in summer, in a green state; and they are dried for winter.—*Abridged from Encyc. of Gard.*

MELON.—*Cucumis melo*, and *Cucurbita citrullus.*—There are but two species, the melon with a rough or embroidered coat, called musk-melon, (*cucumis melo,*) and the melon with a smooth skin, called water-melon, (*cucurbita citrullus.*) Of each of the species there are many varieties. Mr. Russell's Catalogue contains the following:—

CUCUMIS MELO.

Green citron, (*finest variety,*)
Murray's pine apple,
Persian,
Nutmeg,
Minorca,
Large cantaleupe,
Pomegranite.

CUCURBITA CITRULLUS.

Carolina water,
Long Island do.
Apple-seeded do (*early,*)

Seed.—Those who wish to procure melons in perfection, must be careful, in the first place, to procure good seed; secondly, to plant them remote from an inferior sort, as well as from cucumbers, squashes, gourds, and pumpkins; as degeneracy will infallibly be the consequence of inattention to these directions. Abercrombie says, "Seed under the age of two years is apt to run too much to vine, and show only male flowers; but new seed may be mellowed by being carried in the pocket a fortnight or more, till the heat of the body has dried and hardened it. Seed twenty years old has been known to grow, and make fruitful plants; but seed which has been kept three or four years is quite old enough, and less likely to fail than older."

Soil.—Abercrombie says, "The melon will succeed in any unexhausted loam, rich in vegetable rudiments, with a mixture of sand, but not too light. The following is a good compost; two thirds of top-spit earth from a sheep-common, adding sharp sand, if the earth contains little or none, till half is sand; one sixth of vegetable mould, and one sixth of well-consumed horse-dung. Or, if the earth is not obtained from a sheep-pasture, rotted sheep-dung may be substituted for the last. The ingredients should have been pulverized and incorporated by long previous exposure and turning over." Dr. Deane observed that "a good manure to be put under melons is an old compost of good loam, with the dung of neat cattle or swine."

Sowing melons in the open ground.—Mr. Armstrong says, "To succeed in raising them for market, the Honfleur method, as described by M. Calvel, may be employed.—Select a spot well defended against the north wind, and open to the sun throughout the day. If such is not to be found in your garden, create a temporary and artificial shelter, producing the same effect. At the end of March, form holes two feet in diameter, and distant from each other seven feet and a half; fill these with horse-dung and litter, or a mixture of mould, dung and sand. At the end of twenty days, cover the holes, which have been thus filled, with hand-glasses. When the heat rises to 36 of Reaumu., [113 Fahr.,] sow the seeds four inches apart; and when the plants have acquired two or three leaves, pinch off the end of the branch or runner.* This will produce

* "There is much controversy among gardeners and savants on this point; nor are the pinchers entirely united in opinion, how far this practice should be carried. Some content themselves with taking off the cotyledons, when the

lateral branches, which must again be pinched off, as soon as they respectively attain to the length of ten inches. When the plant has outgrown the glass, the latter becomes useless, and may be removed; but, should the weather be wet or chilly, substitute coverings of clean straw for that of the glasses, until the young plant becomes strong enough to bear the open air. Two or three melons only are left on each vine, and under each of these is placed a slate, without which the upper and under side will not ripen together. Two months are required to mature them. The people of Honfleur attribute their success in melon-raising to the *sea-vapour* which surrounds them, and to the *saline* particles contained in it, an advantage to be any where commanded, by dissolving a little salt in the water employed to moisten them." Whether a bed of slate would prove too warm for the melon in our climate, we cannot say. Perhaps shingles or boards might be preferable, as they would not be rendered so hot by the noon-day sun, nor so cold by the night air. We have never known salt, either in substance or solution, used as a manure for melons, but think it would be well to try its effects.

The following are M'Mahon's directions for raising melons in the open ground. Some time in May, "prepare a place of rich, sandy ground, well exposed to the sun; manure it, and give it a good digging; then mark it out into squares of six feet every way; at the angle of every square dig a hole twelve inches deep, and eighteen over, into which put seven or eight inches deep of old hot-bed dung, or very rotten manure; throw thereon about four inches of earth, and mix the dung and earth well with the spade; after which draw the remainder of the earth over the mixture, so as to form a round hill about a foot broad at top. Some people use hot stable-dung under an idea that its heat would promote the vegetation of the seed: this is a mistaken notion, as, in a few hours, it loses all it had, for want of a sufficient quantity being together to promote fermentation, and becomes a dryish wisp, unfit, at least for the present, to afford either heat or nourishment to the plants.

"When your hills are all prepared as above, plant in each, towards the centre, eight or nine grains of good mel-

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plant has acquired three or four leaves; while others take off the principal branches of the first eye above the fruit, and suppress all the secondary branches, male flowers and tendrils. These operations, says Mr. Bosc, are founded in bad reasoning. A cutting, which suppresses two thirds of the plant at once cannot fail to disorganize what remains."

on-seed, distant two inches from one another, and cover them about half an inch deep."

After-culture.—"When the plants are up, and in a state of forwardness, producing their rough leaves, they must be thinned to two or three in each hill. the extra number in some may serve to fill up deficiences in others: draw earth from time to time round the hills, and as high about the plants as the seed-leaves; when fit stop them. This operation should be performed when the plants have two rough leaves, and when the second is about an inch broad, having the first runner-bud rising at its base; the sooner this is detached, the sooner the plants acquire strength, and put out fruitful runners.

"It is to be done in the following manner:—

"You will see arising in the centre of the plant, at the bottom of the second rough leaf, the end of the first runner, like a small bud; which bud or runner, being the advancing top of the plant, is now to be taken off close, and may be done either with the point of a penknife or small scissors, or pinched off carefully with the finger and thumb; but, whichever way you take it off, be careful not to go so close as to wound the joint from whence it proceeds."

Armstrong says, "If the branches be vigorous and long, stretch them carefully over a level surface, and bury every fourth or fifth joint. This is best done by means of a wooden crotchet. The objects of pinching, or shortening the stem, are thus completely fulfilled, without any of the risk which attends that operation, and with advantages peculiar to this method; as, wherever the plant is buried, new roots are formed for the better nutrition of the stem and the fruit."

Setting.—"As the fruit-bearers come into blossom, you may assist the setting of the fruit, by impregnating some of the female blossoms with the male flowers, as directed for the cucumber. The melon, however, will also set naturally, and produce fertile seeds, if the time of fructification fall at a season when the glasses can be left almost constantly open."—*Aber.* Nicol says he has "proved, experimentally, that melons not impregnated will not swell off so fair and handsome as impregnated ones, and therefore considers it more necessary to attend to this operation in melons than in cucumbers."—*Loudon.*

Care of the fruit.—As the fruit increases to the size of a walnut, place a flat tile or slate under each, to protect it from the damp of the earth; the slab, thus interposed, will

also assist the fruit to ripen, by reflecting the rays of the sun. —*Aber.* Nicol advises placing the fruit on bits of slate or glass some time before it begins to ripen; but by no means slate or moss the whole surface of the bed.

Forcing melons.—The "*Honfleur* method" of forwarding the production of melons, as stated by Mr. Armstrong, has been given, pp. 199, 200. The same writer continues, "If we want melons at a period earlier than this method will give them, we must employ a higher degree and a longer continuance of artificial heat; in a word, we must resort to *hot-beds*, and in these the point most important and difficult of attainment at the same time is, to secure a certain degree of heat, and no more, throughout the whole process. To lessen the difficulty in this case, gardeners, who understand their trade, make choice of those varieties which have the thinnest skins and the least bulk, as experience proves that, other things being equal, they require less heat than those of thicker rinds and greater size, and are of course less subject to some of the accidents to which this species of culture is exposed. In choosing the seeds, those of the last year are only to be used, because they are of quicker vegetation than old ones, and, accordingly, best fulfil the intention of the hot-bed, which is, to give *early* fruit. Another practice conducive to the safety of the plants, is, to sow the seeds in small pots, and then to plunge them into a hot-bed. If the heat be deficient, they are, in this case, made no worse than they would have been, if sown directly in the bed; and if it be excessive, it is only necessary to raise the pots, without in the smallest degree disturbing the plant. These things being premised, it but remains to show what ought to be the subsequent management after the seed has been sown, and the pots placed under the frames. One of the most important points now to be observed, is sufficiently to ventilate the bed, as well before as after the plants show themselves. This should be done at mid-day and in sunshine, and as often as a necessity for it shall be indicated by an accumulation of steam under the glasses. At night, these (the glasses) should be carefully covered with matting. These two preliminaries (ventilation in the day, and covering at night) being carefully observed, your plants will soon show themselves in a vigorous and healthy state, and may be kept in that condition by a continuation of the same means, and by moderately moistening the earth when it shall have become too dry. The water employed should be of the same temperature

of the air under the frames; and, to secure this, it is well to keep a supply of it in a pot, placed in a corner of the hot-bed. In about a month, the plants, thus raised, will be fit for transferring to a second and larger hot-bed, constructed like the preceding, with the exception, that the mass of dung must now be greater, and that, after earthing, the bed should not be less than three and a half or four feet in depth. The plants, with the earth in which they grow, are now to be taken from the pots—an operation in which practice only will make us expert, and which consists in placing the neck of the plant between the first and second finger of the left hand, reversing the pot, and gently striking its sides till the earth be disengaged. The discharged mass is then placed in a hole, previously prepared in the square, where it is intended the plant shall ripen and produce."

Cutting the fruit.—Nicol observes, that "Melons, if allowed to remain on the plant till they be of a deep yellow colour, lose much of their flavour. They should, therefore, be cut as soon as they begin to change to a greenish-yellow, or, rather, as soon as they begin to smell ripe. They may lie in a frame for a day or two, if not immediately wanted, where they will acquire sufficient colour. But if they are let remain many days in the frame, they will become as insipid as if they had been left too long on the plant."

Saving seed.—The ordinary mode is to request the seeds of particularly fine fruits of approved sorts to be returned from table. The best way, however, is to pick some best ripe fruit, take out the seed, clean it from the pulp, and let it be well dried and hardened; and then put it up in papers.—*Abercrombie.* Nicol says, wash it very clean, skimming off the light seeds, as those only which sink in water will grow. Great care must be taken that the sorts from which seeds are saved are genuine and distinct. When different sorts are planted in the same bed, this cannot be the case.

Second crop from the same plants.—"When the fruit of the first crop is off, a second crop may be obtained from the same stools, which often proves more productive than the first. If the first crop is taken before the middle of June, the second will come at a very good time. For this purpose, as soon as the fruit is cut, prune the plant. Shorten the vigorous, healthy runners, at a promising joint, to force out new laterals, cutting about two inches above the joint. At the same time, take off all decayed or sickly vines,

and all dead leaves. Stir the surface of the mould, and renew it partially by three inches' depth of fresh compost. Water the plants copiously, shutting down the glasses for the night. Shade in the middle of hot days; and give but little air, until the plant has made new radicles and shoots. Afterwards repeat the course of culture above described, from the stage when the first runners are sent out till fruit is cut."—*Loudon.*

Insects and diseases.—To prevent melon-plants from being infested with insects, or injured by diseases of any kind, no better method can be adopted than to keep the plants constantly in a healthy, vigorous, growing state; for this purpose, M'Phail observes, "They must be constantly attended to, giving them plenty of heat and water. In warm weather, in the spring and in summer, they should be watered occasionally all over their fruit and leaves, till the earth in which they grow be thoroughly moistened." In this country, melons and cucumbers are much infested by a small yellow bug, and perhaps the best method of securing them is covering the plants with a frame, on which millinet is stretched and fastened, as directed under the article CUCUMBER.

Use.—The use of melons, as a palatable and wholesome article of diet, is too well known to need any remarks. Dr. Mease, of Philadelphia, observes, that "The juice of the sweeter kind of water-melon yields, on inspissation, a bright light-coloured syrup, which would answer every purpose required of any syrup. Mr. Henry Drinker, of Philadelphia, procured half a pound of this syrup, from fourteen pounds of melon juice, a part of which I tasted, and found very pleasant." To make the most of unripe melons, Loudon's Magazine directs to "boil them, and season them with spices and salt, or bake them like a pumpkin-pie." The rind of the water-melon is also used for pickling, &c.

MINT.—*Mentha.*—This is a genus of plants comprising twenty-four species. Those cultivated in gardens are peppermint, *(M. piperita;)* spearmint, *(M. viridis;)* penny-royal-mint, *(M. pulegium.)*

Culture.—All "the species are raised by the same methods, viz. by parting the roots, by offset young plants, and by cuttings of the stalks. Spearmint and peppermint like a moist soil; penny-royal, a strong loam. The plants set in spring or summer will come into use the same year. They may be placed about eight inches apart, on beds about

four feet wide, allowing a path two feet broad. New beds should be made every three years.

Gathering the crop, and use.—"Mint should be cut for drying," says Philips, "just when it is in flower, and on a fine day; for if cut in damp weather, the leaves will turn black. It should be tied in small bunches, and dried in a shady place, out of the wind; but, to retain its natural virtues more effectually, it has been found better to place the mint in a screen, and to dry it quickly before a fire, so that it may be powdered and immediately put into glass bottles, and kept well stopped. Parsley, thyme, sage, and other herbs, retain their full fragrance when thus prepared, and are by this mode secured from dust, and always ready to the hand of the cook.

"A conserve made of mint is grateful, and the distilled waters, both simple and spirituous, are much esteemed. The juice of spearmint, drank in vinegar, often stops the hiccup. Lewis observes, what has before been observed by Pliny, that mint prevents the coagulation of milk, and hence it is recommended in milk diets.'

MULBERRY.—*Morus.*—*See* SILK.

MUSHROOM.—*Agaricus.*—This is a genus of plants comprising a great many species, of which, according to some authors, three hundred are natives of Great Britain. The kind cultivated in gardens is the *Agaricus campestris*, which is thus described by M'Mahon:—"The *gills* of this are loose, of a pinky red, changing to liver colour, in contact, but not united with the stem; very thick set, some forked next the stem, some next the edge of the cap, some at both ends, and generally, in that case, excluding the intermediate smaller gills. *Cap*, white, changing to brown when old, and becoming scurfy, fleshy, and regularly convex, but with age flat, and liquefying in decay; *flesh* white; diameter commonly from one inch to three, or sometimes four or more. *Stem* solid, one to three inches high, and about half an inch in diameter."

Loudon says, "The mushroom is a well known native vegetable, springing up in open pastures in August and September. It is most readily distinguished, when of middle size, by its fine pink or flesh-coloured gills, and pleasant smell; in a more advanced stage, the gills become of a chocolate colour, and it is then more apt to be confounded with other kinds of dubious quality; but that species which most nearly resembles it, is slimy to the touch, and destitute of the fine odour, having rather a disagreeable

smell: further, the noxious kind grows in woods, or on the margins of woods, while the true mushroom springs up chiefly in open pastures, and should be gathered only in such places."

Mr. Armstrong gives the following directions for cultivating the garden mushroom:—"Prepare a bed, early in October, either in a corner of the hot-house, if you have one, or a dry and warm cellar. The width of the bed at bottom should not be less than four feet, and its length in proportion to the spawn provided. Its sides should rise perpendicularly one foot, and should afterwards decrease to the centre, forming four sloping surfaces. We need hardly say that the material of the bed at this stage of the business must be horse-dung, well forked, and pressed together to prevent its settling unequally. It should then be covered with long straw, as well to exclude frost as to keep in the volatile parts of the mass, which would otherwise escape. After ten days, the temperature of the bed will be sufficiently moderated, when the straw is to be removed, and a covering of good mould, to the depth of an inch, laid over the dung. On this the seed or spawn of the mushroom [which are threads or fibres of a white colour, found in old pasture-grounds, in masses of rotten horse-dung, sometimes under stable-floors, and frequently in the remains of old hot-beds] is to be placed in rows, six inches apart, occupying all the sloping parts of the bed, which is again to be covered with a second inch of fresh mould and a coat of straw. If your bed has been well constructed, your mushrooms will be fit for use at the end of five or six weeks, and will continue to be productive for several months. Should you, however, in the course of the winter, find its productiveness diminished, take off nearly all the original covering, and replace it with eight or ten inches of fresh dung and a coat of clean straw. This, by creating a new heat, will revive the action of the spawn, and give a long succession of mushrooms."—*Mem. of N. Y. Board of Agr.* vol. ii. p. 125.

Use.—The garden mushroom is eaten fresh, either stewed or boiled; and preserved as a pickle, or in powder, or dried whole. The sauce commonly called *ketchup* (supposed, by Martyn, from the Japanese, *kit-jap*) is or ought to be made from its juice with salt and spices. Wild mushrooms from old pastures are generally considered as more delicate in flavour, and more tender in flesh, than those raised in artificial beds. But the young or butter

mushrooms, of the cultivated sort, are firmer, and better for pickling; and in using cultivated mushrooms, there is evidently much less risk of deleterious kinds being employed." —*Neill* and *Martyn*.

"*Antidote to poisonous sorts.*—All fungi should be used with great caution, for even the *champignon* and edible garden-mushrooms possess deleterious qualities when grown in certain places. All the edible species should be thoroughly masticated, before taken into the stomach, as this greatly lessens the effects of poisons. When accidents of this sort happen, vomiting should be immediately excited, and then the vegetable acids should be given, either vinegar, lemon-juice, or that of apples; after which, give ether and antispasmodic remedies, to stop the excessive bilious vomiting. Infusions of gall-nut, oak-bark, and Peruvian bark are recommended as capable of neutralizing the poisonous principle of mushrooms. It is, however, the safest way not to eat any of the *good*, but *less common* sorts, until they have been soaked in vinegar. Spirit of wine and vinegar extract some part of their poison; and tannin matter decomposes the greatest part of it."—*Botanist's Companion*, vol. ii. p. 145.

MUSTARD.—*Sinapis.*—Of this plant there are two species in cultivation, the *black* and the *white;* annuals, and natives of Great Britain.

The following are Loudon's directions for the culture of the white mustard, *S. alba.* For spring and summer consumption, sow once a week or fortnight, in dry, warm situations, in February and March; and, afterwards, in any other compartment. "In summer, sow in shady borders, if it be hot, sunny weather; or, have the bed shaded. Generally, sow in shallow, flat drills, from three to six inches apart; scatter the seed thick and regular, and cover in thinly with the earth, about a quarter of an inch. To furnish gatherings in winter or early in spring, sow in frames or under hand-glasses; and when the weather is frosty, or very cold, in hot-beds and stoves."

Use.—"This species," according to Loudon, "is cultivated chiefly as a small salad, and is used like cresses, while in the seed: when these are newly expanded, they are mild and tender; but when the plants have advanced into the rough leaves, they eat rank and disagreeable." "In Spain, and throughout the south of Europe, the seed of the white species is preferred, for the fabrication of mustard, because

giving a whiter and milder flour than the seed of the black."—*Armstrong.*

The seed of this plant is also celebrated for its medical virtues, being at once a tonic and an aperient; cleansing the stomach and bowels, and bracing the system at the same time.—See *N. E. Farmer*, vol. vi. p. 188.

BLACK MUSTARD—*S. nigra*—is a larger plant than the white, with much darker leaves, and their divisions blunter.

Use.—"Black mustard is chiefly cultivated in fields for the mill, and for medicinal purposes. It is sometimes, however, sown in gardens, and the tender leaves used as greens, early in the spring. The seed leaves, in common with those of the cress, radish, rape, &c., are sometimes used as a salad ingredient; but the grand purpose for which the plant is cultivated, is for seeds, which, ground, produce the well known condiment. If the seeds, Dr. Cullen observes, be taken fresh from the plant, and ground, the powder has little pungency, but is very bitter; by steeping in vinegar, however, the esential oil is evolved, and the powder becomes extremely pungent. In moistening mustard-powder for the table, it may be remarked, that it makes the best appearance when rich milk is used; but the mixture, in this case, does not keep good for more than two days. The seeds of both the black and white mustard are often used, in an entire state, medicinally."

Culture for the mill.—"To raise seed for flour of mustard, and other officinal occasions, sow, either in March or April, in any open compartment; or make large sowings in fields, where designed for public supply. Sow moderately thick, either in drills, from six to twelve inches asunder, or broad-cast, and rake or harrow in the seed. When the plants are two or three inches in the growth, hoe and thin them moderately where too thick, and clear them from weeds. They will soon run up in stalks, and, in July or August, return a crop of seed ripe for gathering."—*Abercrombie.*

NECTARINE.—*Amygdalus Persica.*—This is, by some writers, considered as the same fruit with the peach, and its culture is the same. See art. FRUIT, for its different kinds, and PEACH, for its culture.

NURSERY.—In establishing a nursery, two points should be contemplated—fitness as to the disposal of the produce, and fitness as to shelter, aspect, and soil. Regard

must be had to the leading roads of the district, the means of carriage by land or water, the objects which will probably be most in demand, whether seedlings, fruit-trees, vines, native plants, tender exotics, or all these united.

"In order to have a complete nursery, it should contain soils of various qualities, and not less than eighteen inches or two feet deep; the generality of it should be light, friable earth; a part of it should be of a clayey nature, and another part should be mossy. Each of these will be found peculiarly useful in the raising of the different kinds of young plants. The whole should be well drained and trenched, and cropped with vegetables for one, or even two years, previously to sowing tree seeds. For transplanting, it may be used the first year. A nursery may certainly be over-sheltered; but this is likely to happen only in the case of its being very small; for, if it extend to several acres, unless it be surrounded by very tall trees, the area will be considerably exposed. No part should be either too much exposed, or too much sheltered. Any aspect from east to west, following the course of the sun, will answer. Ground of an unequal surface is most likely to contain the various soils above-mentioned. A nursery should, therefore, in general, rise from a level to a pretty smart acclivity, yet no part of it should be too steep, because it is, in that case, very troublesome to labour. The nursery ground may be sufficiently fenced by a stone wall, or even a hedge, six feet high; and if it be of small size, an acre or thereabouts, it will require no other shelter over all the space. The fence, whether of thorns or stone, should be made proof against the admission of hares or rabbits. It should be subdivided into compartments and borders, of proportionate size to the contents of the area, by walks. The compartments should never be encumbered with large trees, as apples, pears, or the like, because, being already established in the ground, they never fail to rob the young trees of their food, and to cause them to be poor and stunted, unworthy of being planted. It would be very convenient to have a rill of water passing through the ground, or to have a small pond, fed by a spring, or a pipe, for the purpose of watering.

"In preparing the soil for the culture of trees, it will be advisable to trench it to its full depth, and necessary to give it a good dressing of lime or marl, or dung in compost. Rank manure, such as stable-litter, should not be applied to nursery ground, at the time of cropping with nursery arti-

cles; but if it be necessary to enrich it, this should be done by a manured crop of onions, turnips, lettuces, or the like. Potatoes should never go before a crop of seedlings, even of the coarser sorts, as ash, oak, or chestnut; because potatoes never can be taken clean out of the ground; and, it being indispensable to pull up those which rise among the tree seedlings, many of these unavoidably come up along with them."—*Nicol's Planter's Calender.*

"A rotting ground will be required for the preparation of certain seeds, by mixing them with sand, ashes, or soil, and leaving them there for different periods, from six months to two years, to rot off their interior coverings. On a small scale, a portion of the compost ground of the kitchen-garden may be used for this purpose. If the scale is large, an area of a few square poles should be set apart for bedding in plants taken up for replanting, or what is called laying in by the heels, or sloughing: this is generally called *the bedding ground*, or, in Scotland, *the sloughing ground.*"—*Loudon.*

"It has been a received opinion, that the soil for a nursery should not be made rich, as the plants, when removed to a more fertile soil, will flourish more luxuriantly; but later observation has decided, that the reverse of this will be found correct. There is a close analogy between vegetable and animal life; and it is a dictate of nature, that both require a full supply of nutriment, from their earliest existence. It would be absurd to suppose, that the tender roots of young seedlings are capable of drawing sufficient nutriment from a rank, barren, and uncultivated soil, and those that are barely supported, or nearly starved at first, will never afterwards become vigorous, stately, and handsome, though surrounded by the richest mould. Repeated experiments have proved that a strong and vigorous plant, that has grown up quickly, and arrived at considerable magnitude in a short time, never fails to grow better, after transplanting, than another of the same size, that is older and stunted in its growth. Where the soil is poor and lean, trees, in every stage of their growth, are observed to be languid, weak, and stunted; while those reared in a good, mellow soil, always assume a free growth, and advance with strength and vigour. It is evident, therefore, that the ground to be occupied for a fruit nursery, requires to be made rich and fertile. The soil should also be deep, well pulverized, and cleared of all roots and weeds. The seeds may be sown either in autumn or April, and, in one year

after, the young plants may be taken up, and replanted in the nursery. It is important that the situation be such as to admit of a free circulation of air, and open to the sun, that the plants may be preserved in a healthy condition. Plants, reared in a confined and shaded situation, in a large town, and removed to an open exposure in the country, will long continue in a debilitated condition; like a puny city invalid, their growth will be greatly impeded, and many years will elapse before they attain to a state of vigour, health, and hardihood.

"In *Marshall's Rural Economy* it is directed, that the seedling plants, when taken from the seed-bed, be sorted agreeably to the strength of their roots, that they may rise evenly together. The tap, or large bottom root, should be taken off, and the longer side-root-lets should be shortened. The young plants should then be set in rows, three feet apart, and from fifteen to eighteen inches asunder, in the rows; care being taken not to cramp the roots, but to bed them evenly and horizontally among the mould. In strictness of management, they ought, two years previous to their being transferred to the orchard, to be transplanted into unmanured, double-dug ground, four feet every way apart, in order that the feeding fibres may be brought so near the stem, that they may be removed with it into the orchard, instead of being, as they generally are, left behind in the nursery. Hence, in this second transplanting, as in the first, the branches of the root should not be left too long, but ought to be shortened in such a manner as to induce them to form a regular globular roof, sufficiently small to be removed with all their plants, yet sufficiently large to give it firmness and vigour in the plantation."—*Thacher's Orchardist.*

A nursery should not be on a spot where fruit-trees have lately grown, or, indeed, any other deep-rooted plants. Miller advises to have a nursery of forest-trees in the place where the forest is designed to be planted, so that a sufficient number of the trees may be left standing, after the rest have been removed.

"If a nursery be in such a situation that the young trees are in danger of being broken down by deep snows, either the fence on the windward side should be made so open that the wind may have a free passage through it, and drive away the snow, or else the trees may be defended by staking. A stake a little taller than the tree, made of a slip of board, should be set close on the windward side,

and the top of the tree fastened to it with a soft string; or two such stakes may be so set that the upper ends may meet over the top of the tree."—*Deane.*

The seeds which are sown in a nursery should be selected from the best sorts of fruit. See p. 17 of this work.

OAK.—*Quercus.*—Miller's *Gardener's Dictionary* says, oaks are best produced from the acorns in the places where the trees are to remain; because those which are transplanted will not grow to so large a size, nor remain sound so long. He advises to plant the acorns as soon as they are ripe in October, which will come up in the following April. But, says Dr. Deane, "Another writer directs that the acorns be gathered in autumn, and kept in a box or boxes of sand till the following spring. Then open them, and carefully plant those of them which are sprouted, which, he says, will not fail to come up. But no time should be allowed for the sprouts to dry. I incline to prefer this method, especially since I have tried that which is recommended by Miller without success. Not one in a hundred ever came up."

The ground designed for a plantation of oaks, according to Miller, should have a good and durable fence, should be prepared by three or four ploughings and harrowings—the acorns should be taken from the largest and most thrifty trees—be sowed in drills about four feet asunder, and two inches deep, and two inches apart in the drills. The ground should be ploughed and hoed among them, during the first eight or ten years; after two years, some of the plants should be drawn out where they are too close; and so from time to time, as they grow larger, till they come to be eight feet distance each way, when they will want no thinning for a long time. But after the trees come to be large, he thinks twenty-five or thirty feet apart will be the right distance.

The oak thrives better in hilly than in boggy ground, but flourishes most luxuriantly on rich, black soils, or in strong, moist loam. It will grow, however, on almost any soil that is not too wet.

The Massachusetts Society for the Promotion of Agriculture have offered a premium of one hundred dollars for the best plantation of white oak trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the first of September, 1827.

It is observed, in the work called *Gleanings, &c. on Husbandry and Gardening*, that oaks, "when very young, may be transplanted twice or thrice, if, each time, the prin-

cipal root is cut off. Oaks raised from the acorn without removing, on account of the tap-root striking down into the ground, where there is less nourishment, grow slowly, but are, when they arrive at timber, the best; being generally fuller at heart, and more strong and lasting. Oak plants of one or two years' growth, after they have taken root, are often cut off a little above the ground, if they are stunted or crooked, and the second shoot is trusted to for the tree; as it is found to grow with greater luxuriance than the first.

OKRA.—*Hibiscus esculentus.*—A valuable garden plant, easily propagated by seeds sown in May. It is said to be excellent in cookery, as a sauce. Its ripe seeds, burned, and used as coffee, can scarcely be distinguished therefrom. It should be planted about an inch deep, and hoed two or three times, like peas. M'Mahon says, "It may be sown with certainty of success at the time that Indian corn is planted. Draw drills about an inch deep, and four feet asunder, into which drop the seeds at the distance of eight inches from one another, or rather drop two or three in each place, lest one should not grow, and cover them an inch in depth. As they advance in growth, earth them up two or three times as you do peas, and they will produce abundantly."

ONION.—*Allium cepa.*—The common bulbous onion is a biennial plant, supposed to be a native of Asia. There are many varieties of this plant. Those mentioned in Mr. Russell's Catalogue are the following:—

White Portugal,	Top or tree onion,	Large red,
Yellow,	Silver-skinned,	Potato onion.
Genuine Madeira,	Strasburgh,	

The Strasburg is most generally adopted for principal crops. The silver-skinned is reckoned among the best for pickling. "The top or tree onion has the remarkable property of producing the onions at the top of the stalk, and is valuable for domestic use, particularly for pickling, in which they are excellent, and superior in flavour to the common kinds. It is also used for any other purpose that onions usually are. It is perennial, and propagated by planting the bulbs in spring or autumn, either the roots, bulbs, or those on the top of the stalks."—*Russell's Catalogue.*

Soil and culture.—The onion, "to attain a good size, requires rich, mellow ground, on a dry sub-soil. If the soil be poor or exhausted, recruit it with a compost of fresh loam

and well-consumed dung, avoiding to use stable-dung in a rank, unreduced state. Turn in the manure to a moderate depth; and, in digging the ground, let it be broken fine. Grow pickles in poor, light ground, to keep them small. The market-gardeners at Hexham sow their onion-seed on the same ground for twenty or more years in succession, but annually manure the soil. After digging and levelling the ground, the manure, in a very rotten state, is spread upon it, the onion-seed sown upon the manure, and covered with earth from the alleys, and the crops are abundant, and excellent in quality."—*Hort. Trans.* i. 121.

Deane's *New England Farmer* says, "A spot of ground should be chosen for them, which is moist and sandy; because they require much heat and a considerable degree of moisture. A low situation, where the sand has been washed down from a neighbouring hill, is very proper for them. And if it be the wash of a sandy road, so much the better. The most suitable manures are old, rotten cow and horse-dung mixed, ashes, but especially soot. A small quantity of ashes or sand, or both, should be spread over them after sowing, especially if the soil be not sandy. And it is not amiss to roll the ground after sowing; or harden the surface with the back of a shovel."

Mr. Armstrong says, "It is propagated either by the seed or by the bulbs. In the first case, you sow in shallow drills, twelve or fourteen inches apart; cover with mould, and, when the plants come up, thin them, so that they may stand three or four inches from each other. The sooner this is done in the spring, after the earth has acquired a temperature favourable to vegetation, the better will be your crop. It only remains to keep the earth loose and clean about the roots, and, if the vegetation be too vigorous, to break down the tops, so as to determine the juices to the bulbs. In the other case you but employ the small and half-grown onion of the preceding fall instead of seed."

Mr. Hubbard, of Concord, Mass. in an article published in the *N. E. Farmer*, vol. iii. p. 89, says, "The soil ought to be a *deep, black loam*, that will crumble fine when the plough passes through it; such as is easily raked smooth and pulverized. A heavy, clammy soil, that adheres together when both wet and dry—a dry, clayey, or a sandy soil, will not answer. I know of no vegetable that is so difficult to please with a soil, as the onion: though they will grow well, yet they will not ripen, but hold green throughout the fall, and many of them will be what are generally

known by the name of *scullions*, with the neck stiff and green; whereas those on suitable ground are ripe and dry by the first of September. Rotten stable-manure, made in the winter preceding the spring in which it is put on the land, is generally made use of, to be spread on the ground, and ploughed in. I have a piece of land four rods square, on which onions have been raised, I suppose, these *eighty years;* and since I have improved it, I have yearly spread upon it five cart-loads of manure, such as are usually drawn by one pair of oxen; and have raised from *four* to *seven hundred* bunches of onions upon it, at three and a half pounds to the bunch, of which about sixteen make a bushel."

Mr. Hubbard puts the seed into the ground as soon as the frost is out, and it is sufficiently dry to be worked; frequently the latter part of March, but more frequently in the first days of April. He has always planted them in *hills*, which is the general practice in Concord. "My method of preparing the ground and planting the seed is, *first*, carry on the manure, and spread it as even as possible, when the ground is to be ploughed deep; *then* let the plat be divided into beds, about three feet nine inches wide; to do which the easier way is to stretch a line across, lining one bed at a time; after this, let a man, with a shovel or a potato-hoe, make an alley through the whole piece, to separate the beds, about four inches deep, and sufficiently wide to admit a person to walk in it. Then let the lumps be beat fine, levelling the ground, and shaping the beds; which, after being raked smooth, must be divided into squares of eight or nine inches. This is best done by a line; or it is sufficiently exact to draw a heavy rope backwards and forwards. Now let the seeds, six or seven in a hill, more or less, be dropped into the corners of the squares, and covered with mould, about half an inch deep, pressed down with the hand."

A writer for the *N. E. Farmer*, vol. iii. p. 249, with the signature J. M., recommends "a moist, black soil," as best, but says "a free, deep loam will answer very well." "The onion is not by nature inclined to root deep. You must give it a hard bottom to grow on, and keep your manure on the surface within reach of the roots; then they will grow large, flat, and handsome."—Advises to sow the same piece for several successive years. "I have always *sowed onions in drills*, about eighteen inches apart, to give fair play to the hoe. Onions must be sowed as early as possi-

ble after the frost is out of the ground: in this climate, if the seed is not in the ground before the first of May, there is but little chance for a crop. It must be covered slightly, and stamped well over with the hoe to close it well. I would recommend, as most essential, to sow the seed sparingly. Even the best gardeners are apt to put in too much seed. The consequence is, that the young plants come up so thick that they run up spiry and weak; and, when you come to thin them, you find great difficulty to pull up so many without injuring those that you leave; and the worst injury is what you do to the roots, which you tear and loosen. Therefore have seed of your own raising, or that you know is fresh, and sow sparingly."

In the *N. E. Farmer*, vol. iii. p. 265, are the observations of I. Tucker, Esq. of Salem, Mass., who says, "The land should be ploughed about four inches in depth, and harrowed so as to make it very fine; the manure, which should always be a rich compost, should be ploughed in and thoroughly mixed; the land should then be rolled with a heavy roller, to form a close bottom for the bulbs to form upon, and at the same time not so hard as to prevent the small roots of the plant from penetrating. The best onions and the largest crops are produced where the bulbs grow almost entirely on the top of the ground. After the ground has been rolled, and before the seeds are sown, the beds should be raked with a sharp iron rake, to prepare a finely pulverized drill for reception of the seed; and, after the seeds are sown, the drill should be pressed with a board and sufficient weight to bring the earth into close contact with the seed. Care should be taken in selecting seed; none should be sown but such as will be sure to vegetate; and it would be well if no more seed were to be sown than you would have plants to remain and grow in the drill. It would be superfluous to add that, if you would have a good crop of onions, you must not permit a crop of weeds to grow in the same bed; they will not grow well together."

Mr. Adams Knight, of Newbury, Mass., received a premium of twenty dollars for having raised, in 1822, the greatest quantity of onions, being six hundred and fifty-one bushels on one acre. "The soil is a rich, gravelly loam, with a gravel bottom: in 1821 it was cultivated with onions and cabbages, and was manured with about five cords of barn manure, and produced a good crop: after the crop was off the ground, there were five cords of barn manure and two and a half

of leached ashes ploughed in: in April, 1822, it was once ploughed, and sowed in rows 14 inches apart, which took between three and four pounds of seed: in the course of the season, it was hoed between the rows, and weeded four times: in September, the onions were harvested, and there were six hundred and fifty-one bushels. The entire expense of cultivating this acre of onions, including twenty-one dollars and thirty-seven cents, the cost of the manure, was fifty-seven dollars and thirty-eight cents."

The work entitled *Gleanings*, &c. *in Husbandry*, directs to sow onions, if possible, in a dry time, and to tread them in, in light ground.

Loudon says, "When onions are to be drawn young, two ounces of seed will be requisite for a bed four feet by twenty-four; but when to remain for bulbing, one ounce will suffice for a bed five feet by twenty-four feet."

Deane says, "The ground should be dug or ploughed in autumn, not very deep; and then made very fine in the spring, and all the gross roots and roots of weeds taken out; then laid in beds four feet wide. Four rows of holes are made in a bed, the rows ten inches apart, and the holes in the rows ten. About half a dozen seeds are put in a hole, or more, if there be any danger of their not coming up well, and buried an inch under the surface. They will grow very well in bunches. Though the largest onions are those which grow singly some inches apart, those which are more crowded produce larger crops. And the middle-sized onions are better for eating than the largest." The last week in April is the proper time for sowing, according to this author.

The course of culture recommended by Abercrombie for the summer, and what he calls winter-laid-by crops, is as follows:—"Allot an open compartment, and lay it out in beds, from three to five feet in width. Sow broad-cast, equally over the rough surface, moderately thick, bed and bed separately, and rake in the seed lengthwise each bed, in a regular manner. When the plants are three or four inches high, in May and June, let them be timely cleared from weeds, and let the principal crop be thinned, either by hand, or with a small, two-inch hoe; thinning the plants to intervals of from three to five inches in the main crops designed for full bulbing; or, some beds may remain moderately thick for drawing young, by successive thinnings, to the above distance. For the Spanish, from seed obtained

immediately from Spain, the final distance should be six or seven inches. Keep the whole very clear from weeds, in their young and advancing state. The plants will begin bulbing a little in June; more fully in July; and be fully grown in August to large bulbs. In July or August, when the leaves begin to dry at the points, and turn yellow, lay the stems down close to the ground, bending them about two inches up the neck, which promotes the ripening of the bulb, particularly in wet or backward seasons. The crop of full bulbers will be ready to take up towards the middle of August. When the necks shrink, and the leaves decay, pull them wholly up in due time: spread them on a compartment of dry ground, in the full sun, to dry and harden completely, turning them every two or three days; and in a week or fortnight they will be ready to house. Clear off the grossest part of the leaves, stalks, and fibres; then deposit the bulbs in some close, dry apartment, in which sometimes turn them over, and pick out any that decay; and they will thus keep sound and good, all winter and spring, till May following."

Culture of a winter-standing crop, to be drawn for use the succeeding spring.—"Allot a soil rather more light and sandy for the summer crop, on a sub-soil at least equally dry. The compartment, especially for any of the biennial kinds, should lie warm and sheltered. The beds may be three or four feet wide, running parallel to the best aspect. The medium time for the principal sowing falls about the 7th of August; and, for a secondary crop, near the 25th. Sow the bulbing sorts and the Welsh perennial separately; distribute the seed pretty thickly. If the soil be dry and light, tread down the seed evenly along the surface of each bed, and then rake it in neatly. When the plants are come up one, two, or three inches, carefully hand-weed in time, before any rising weeds spread; not thinning the plants, because they should remain thick, for their chance in winter, and to be, by degrees, drawn thinningly, for use in salads and otherwise; but reserve a principal supply to remain till spring. Observe, the Welsh onion, in particular, commonly dies down to the ground about mid-winter; but the root part, remaining wholly sound, sends up a new, vigorous stem in February and March. At the opening of spring, let the whole of both sorts be well cleared from weeds; they will continue fit to draw young during all the spring months, till May; then let some of the bulbous kinds

be thinned, to remain for early bulbing in June and July; but, as they will soon after shoot up in stalk, they are chiefly for present use, not being eligible as keeping-onions."

To preserve onions through the winter, they may be tied together, forming what are called ropes or bunches of onions, and kept in a dry and cool cellar. Moisture rots, and warmth causes them to vegetate. A considerable degree of cold will not injure them, for they resist frost in consequence of a spirituous substance of which they are in part composed. Searing their fibrous roots with a hot iron will prevent them from sprouting.

To obtain seed from onions, they should be planted early in beds, about nine inches apart. The largest and soundest are best. They should be kept free from weeds; and, when the heads of the flowers begin to appear, each plant must have a stake about four feet long, and its stems be loosely tied to the stake by a soft string. Or the stems may be supported by stakes, six or eight feet apart, and pack-thread or rope-yarn fastened from one to the other, a little below the heads. When ripe, the heads are to be cut (or the seed will shed) and spread in the sun, on coarse cloths, to dry; being, however, taken under shelter at night, and in rain. When the seed is beaten out, it is to be dried one day in the sun, and then put in bags to preserve for sowing.

Dr. Deane, and Mr. Nicholson, author of the *Farmer's Assistant*, condemn the practice of beating or breaking down the tops of onions in order to increase the size of the root. Mr. Nicholson observed, "The practice is undoubtedly injurious, as we have seen confirmed by experiment."

"*Culture of the potato onion.*—This variety, erroneously supposed to have been brought from Egypt by the British army about 1805, was grown in Driver's nursery, in 1796, and has been known in Devonshire for upwards of twenty years. It is thus cultivated at Arundel Castle, by Maher:—Having thoroughly prepared the ground, and formed it into beds four feet wide, 'I draw lines the whole length, three to each bed, and, with the end of the rake-handle, make a mark (not a drill) on the surface; on this mark I place the onions, ten inches apart; I then cover them with leaf-mould, rotten dung, or any other light compost, just so that the crowns appear exposed. Nothing more is necessary to be done until they shoot up their tops; then, on a dry day, they are earthed up, like potatoes, and kept free from weeds, until they are taken up. In the west of England,

where this kind of onion is much cultivated, I understand that it is the practice to plant on the shortest day, and take up on the longest. The smallest onions used for planting swell, and become very fine and large, as well as yield offsets; the middle-sized and larger bulbs produce greater clusters.'—*Hort. Trans.* vol. iii. p. 305.

"Dymond states, (*Hort. Trans.* vol. iii, p. 306,) that in Devonshire it is planted in rows, twelve inches apart, and six inches' distance in the row; that the plants are earthed up as they grow, and that the smaller bulbs yield a greater increase than the larger. A similar practice is adopted by some Scotch cultivators.—*Caled. Hort. Mem.* vol. i. p. 343, and vol. iv. p. 216.

"Wedgewood does not earth up, and finds his bulbs acquire a much larger size than when that practice is adopted.—*Hort. Trans.* vol. iii. p. 403. The fact is, as we have observed in generalizing on the subject of earthing up, surface-bulbs, as the onion, turnip, &c., are always prevented from attaining their full size by that operation, whatever they may gain in other respects."—*Loudon.*

Use.—"The properties of onions in no respect differ from those of garlic, excepting that the former are less pungent, (see GARLIC,) and are, therefore, more generally used for culinary purposes. Many persons, however, dislike them on account of the strong and disagreeable smell which they communicate to the breath. But this inconvenience is obviated by eating a few raw leaves of parsley, immediately after partaking of onions, the scent of which is thus nearly removed, and they are, at the same time, rendered more easy of digestion. Vinegar also answers the same purpose."—*Dom. Encyc.*

ORCHARD.—*Soil.*—Any soil is suitable for an orchard, which produces good crops of grain, grass, or garden vegetables; but a good, deep, sandy loam, not too dry, nor very moist, is to be preferred. In the stiffest part of the ground, you may plant pear-trees; in the lighter, apples, plums, and cherries; and, in the lightest, peach, nectarine, and apricots.

Aspect.—A south-eastern aspect is generally recommended; but, when this exposes the trees to the sea winds, a south-western may be better. Some recommend a northern aspect, and planting trees the north side of a wall, to prevent them from budding and blowing so early in the spring as to expose them to frosts.

Preparation of the ground.—If the land be swarded, it

should be broken up and tilled at least one year before the trees are planted.

Manure.—Rotten leaves, or the mould formed by the decomposition of leaves, is recommended by Forsyth. Compost, or rich earth, is said to be preferable to dung, which encourages insects and blight. M'Mahon says, "It is well known that where hogs and poultry are constantly running over the ground, the trees seldom fail of a crop, which is the best proof that manure is necessary. Any manure will suit an orchard; but the sweepings of cow-houses, hog-pens, slaughter-houses, poultry and pigeon-houses, emptying of drains, &c. are more disposed to facilitate the growth of fruit-trees than stable-manure. However, any kind of manure is better than none at all."

"Hog-dung is accounted to have a peculiar virtue in in vigorating weak trees. Rotted turf, or any vegetable refuse, is a general manure, excellent for all soils not already too rich. For an exhausted soil, where a fruit-tree, which has been an old, profitable occupant, is wished to be continued, a dressing of animal matter is a powerful restorative; such as hogs' or bullocks' blood, offal from the slaughter-house, refuse of skins and leather, decomposed carrion; also urine diluted with water. In a soil which does not effervesce with acids, a little lime, dug in a spit deep, is beneficial to fruit-trees."—*Abercrombie.*

Distance of trees in an orchard.—"It should be considered, at the time of planting, to what size the trees are likely to grow. And they should be set so far asunder, that their limbs will not be likely to interfere with each other, when they arrive at full growth. In a soil that suits them best they will become largest. Twenty-five feet may be the right distance in some soils; but thirty-five feet will not be too much in the best, or even forty."—*Deane.*

Cropping.—"It is proper to crop the ground among new-planted orchard-trees, for a few years, in order to defray the expense of hoeing and cultivating it; which should be done until the temporary plants are removed, and the whole be sown down to grass. But it is by no means advisable to carry the system of cropping with vegetables to such an excess as is frequently done. If the bare expense of cultivating the ground, and the rent, be paid, by such cropping, it should be considered enough. As the trees begin to produce fruit, begin also to relinquish cropping. When by their productions they defray all expenses, crop no longer.

I consider these as being wholesome rules, both for the trees and their owners."—*Loudon.*

Orchards which are laid down to grass last longest; but it is necessary to keep the ground clear of weeds and grass, for some little distance from the roots. They may be pastured with calves and swine, and by the latter with much advantage, as they destroy the curculio, (see p. 175.) Sheep may be admitted, provided the trees are smeared with a coat of lime, or with Forsyth's composition; but large cattle, which can reach up to the limbs of the trees, should not be suffered to run in an orchard. In Germany, they surround the roots of fruit-trees in grass-land with hemp-breakings, not only near the stock, but for some distance from the tree. The breakings of flax and spent tan are also recommended for the same purpose.

Mr. Benjamin Wheeler, of Framingham, Mass., gives the following prescription of a wash for fruit-trees, which has been repeatedly tested, and found very useful:—"Dissolve two pounds of potash, of the first quality, in seven quarts of water, for the bodies of the trees. If the limbs are covered with moss or lice, I take a painter's brush, and apply the solution to the moss, &c., with care not to touch the leaves or buds. It may be done at any time of the year, when we are most at leisure. Once in from two to four years is generally sufficient. I have no general rule, however, but wash them as often as they appear to need it, which is always when the bark is not smooth."

PARSLEY.—*Apium petroselinum.*—The parsley is a hardy biennial, a native of Sardinia. The varieties, according to Loudon, are,

The common, plain-leaved, (*seldom cultivated;*)	The broad-leaved, or large-rooted Hamburgh, (*cultivated for its carrot-shaped root.*)
The curled or thick-leaved, (*most esteemed;*)	

Mr. Russell's Catalogue mentions the following kinds:

Curled or double—*Apium petroselinum crispum;*	Hamburgh, or large-rooted, do. var. *tuberosum;*
Dwarf curled, (*very much curled,*)	Siberian, (*very hardy, single-leafed, and of fine flavour.*)
do. do.	

and adds, "sown from April to August. Parsley seldom vegetates under five weeks after sowing. It is recommended to soak the seed twelve hours in water mixed with sulphur. This process, with attentive watering, will cause the seed to vegetate in less than a fortnight." The

seed should be fresh. Loudon says, two years' old seed will not grow.

Culture of the pot-herb kinds.—"One sowing in spring will mostly furnish young leaves all the year; though, to answer a constant demand, many persons make successive sowings from February [in Great Britain] to May. Some also sow early in autumn for young parsley in winter and spring; but such a supply is better provided by cutting down established plants. Sow in a single drill along the edge of any compartment, or occasionally in rows nine or twelve inches asunder. Draw small drills, something less than an inch deep; in which drop the seed moderately thick, and cover a little above half an inch. The plants will come up in three or four weeks, and, when two or three inches high, may be gathered as wanted, all the summer, winter, and following spring till May, when they will go to seed. Have always a young crop sowed timely in the spring to succeed the declining old plants. In gathering pot-herb parsley, cut close and regular. In summer, when the plants grow rank, yielding more leaves than can be used, cut them close to the bottom, and they will shoot up stocky, and in a regular, close growth. Observe also to do the same in autumn, about the end of September, that the plants may form heads of fresh young leaves before winter. On the approach of frosty weather, protect them with haum," straw, or any thing else, which will serve for a defence against cold.

Culture of Hamburgh parsley.—"To obtain large roots, allot a compartment where the soil is deep, and has been well digged. Any common mould will suit, if dry and not too rich. Sow in February, [soon as the frost is well out of the ground,] March, or early in April, in one or more beds, either in drills nine inches asunder, or broad-cast, and rake in. The plants should be thinned to nine inches distance, to give room for proper growth in the roots; for use in August, September, October, and thence till the following spring. On the approach of frost, take up some roots, and preserve them in sand. A sowing may be made the third week in June, where young roots are wanted in winter."

The Siberian, or single-leafed parsley, is cultivated in fields. It may be sown very early with oats or other spring grain, mixed with grass seed.—*See Encyc. of Agr.* parag. 5081.

Uses.—This herb is much used and highly valued for

culinary purposes as a pot-herb, for garnishes, &c. The Hamburgh parsley is esteemed for its large, carrot-like root, drawn in autumn and winter for the table. In field cultivation it is said to be a preservative from rot in sheep, and efficacious in curing greasy and surfeited horses, &c.—See *New England Farmer*, vol. vi. page 182.

PARSNEP.—*Pastinaca sativa.*—Loudon observes, that "There is only one variety of the parsnep in general cultivation in Great Britain, but the French possess three—the *Coquaine*, the *Lisbonaise*, and the *Siam*. The *Coquaine*, Dr. Maculloch informs us, (*Caled. Hort. Mem.* vol. 1, p. 408,) is much cultivated in Guernsey and Jersey. The roots run sometimes four feet deep, and are rarely so small in circumference as six inches, having been known to reach sixteen. The leaves of this variety grow to a considerable height, and proceed from the whole crown of the root. The *Lisbonaise* does not extend to so great a depth as the *Coquaine;* but the root is equally good in quality, and what is lost in length is gained in thickness. The leaves are small and short, and only proceed from the centre of the crown. The *Siam* has a root of a yellowish colour, not very large, but tender, and more rich in taste than the other varieties."

Soil.—The soil should be light, deep, and free from stones. It should be dug or trenched before sowing, one good spade deep, at least, (some writers say two spades deep,) being careful to pulverize the soil thoroughly, that the roots may have no obstruction to prevent their running down long and straight. If the soil be proper for them, it is said they will not require much manure; and what is used should be perfectly decomposed, or, if recent, be deposited at the bottom of the trench. They do not impoverish the soil, but, like onions, may be raised many years in the same spot.

Seed estimate, and sowing.—Sow as early as the ground is thawed, if not too wet. Deane observed, that "some sow them in the fall; but that is not a good practice, because the ground will grow too close and stiff for want of stirring in the spring; which cannot well be performed in gardens, without danger of injuring the roots. And weeds will be more apt to abound among them if they be sown in autumn." Loudon says, "For a bed five feet by twenty, the plants to remain thinned to eight inches' distance, half an ounce of seed is the usual proportion." Deane recommends sowing them in rows across beds, fifteen inches apart,

and to allow six inches from plant to plant at the last thinning, which may be early, as they are not often hurt by insects.

Culture.—When the plants are about one, two or three inches high, in May or June, let them be thinned and cleared from weeds either by hand or small hoeing. Keep them afterwards clear from weeds, till the leaves cover the ground, after which no further culture will be required. Parsneps will continue growing till the frosts are very severe, and are not good for use till they have become ripe, late in autumn. Any thing which is to be used early in the season may be sown with parsneps, such as carrots to draw young, radishes, lettuces, &c.

Preserving during winter.—The parsnep is not so liable as the carrot to be hurt by frost if left in the ground, and some let them remain where they grew through winter. But the best way is to dig them some time in November. They should not be wounded nor bruised in digging; neither should the tops be cut off very close to the roots, nor any of the lateral roots cut off. In either case the roots will rot or become bitter. "Many lose their parsneps, or make them sprout, by putting them in a warm cellar. It is better to keep them in some out-house, or in a cellar that freezes; for no degree of frost ever hurts them. But to prevent their drying too much, it is best to cover them with dry sods, or else bury them in sand that has no moisture in it. Beach sand is improper, because the salt in it will make them vegetate."—*Deane.*

Field culture of parsneps.—In giving an account of the agriculture of the island of Jersey, an English writer says, "Parsneps are grown by every farmer, and either by the spade culture alone, by the plough and spade, or by the small and great plough: any soil in good heart and tilth suits them, but peculiarly a deep loam; and in the same spot, generally, are raised beans, peas, cabbage, and, occasionally, potatoes.

"When the ploughing or digging is completed, the field is once harrowed; straight lines are then drawn across, by means of a gardener's rake, usually from north to south; women then proceed with dibbles, and set the beans in rows, at a distance of four inches, or five inches, from bean to bean, in four, three, and sometimes two ranks of beans, leaving intervals of between five and six feet between each of the sown rows. In the use of the dibble, and in dropping the beans, the women have acquired considerable

dexterity. In many instances they are followed by children, who drop into each hole made by the dibble, after the bean, three or four peas; the parsnep seed is then sown at the rate of one third to one half of a bushel to the acre." —*Quayle's General View of the Norman Islands.*

Use.—The writer above quoted asserts, that, in the island of Jersey, parsnep "is eaten with meat, with milk, and with butter; but not, as is the common mode of using it as human food in England, with salt fish, or, as in Ireland, together with potatoes.

"The next most valuable application of this root is hog-feeding. At first it is given to the animal in a raw state, afterwards boiled or steamed, and finally, for a week or fortnight, with bean and oat-meal. A hog treated in this way is sufficiently fatted for killing in about six weeks. Its flesh is held superior to that arising from any other food, and does not waste in boiling.

"Bullocks are also fatted with parsneps in about three months; their flesh is here considered of superior flavour to any other beef, and commands, on that account, an additional half-penny in the pound on the price. To milch cows they are also usually given; on this diet, the cream assumes a yellow colour. By the accounts here given, it appears, in proportion to the milk, to be more abundant, than when the animal is kept on any other food whatever. When the cow receives at the rate of thirty-five pounds per day, with hay, seven quarts, ale measure, of the milk produce seventeen ounces of butter. It is generally allowed that the flavour of the butter is superior to any other produced in winter.

"Geese are sometimes shut up with the hogs to fatten on parsneps, which they will eat raw. The root is also given boiled; and for a week before killing they are fed with oats or barley only. Horses eat this root greedily; but in this island it is never given them, as it is alleged that, fed on this food, their eyes are injured. About Morlais, horses are not only ordinarily fed on parsneps, but they are considered as the best of all food, superior even to oats."

To save seed.—Transplant some of the best roots as early as the frost will permit in the spring, two feet asunder, inserted over the crown. They will produce seed plentifully in autumn.

PEA.—*Pisum sativum.*—The pea is a hardy annual, a native of the south of Europe, cultivated in Great Britain

from time immemorial, and in this country from its first settlement.

Varieties.—These are numerous: those mentioned in Mr. Russell's Catalogue are,

Early Washington, or true May Pea, (*extra early and fine—grows to the height of two and a half feet;*)
Early double-blossomed, frame, (*early and fine—three feet;*)
Early frame, (*two and a half feet;*)
Early golden Hotspur, (*three feet,*)
Early Charlton, (*three feet;*)
Dwarf blue imperial, (*two feet, a superior variety;*)
Dwarf blue Prussian, (*two and a half feet;*)
Dwarf Spanish, or fan, (*one foot;*)
Dwarf marrowfat, (*three and a half feet;*)
Dwarf sugar, (*pods eaten—three feet*
Matchless, or true tall marrowfat (*six feet;*)
Knight's tall marrows;
Tall, crooked podded sugar, (*pods eaten—six feet;*)
Ladies' finger marrows, (*a prodigious bearer, and delicate eating pea;*)
New nonpareil pea, (*a new and productive sort from Scotland;*)
Knight's dwarf marrows.

"The Charltons are not only very early, but great bearers, and excellent peas for the table; and are therefore equally well fitted for the early and forward succession crops, and inferior to few even for the main summer crops. The frame pea may indeed be raised without the assistance of heat for a forward crop, and, if a genuine sort, will fruit a few days sooner than the Charlton; but it grows low, and bears scantily. The Hotspur is hardy and prolific, and makes returns nearly as quick as the Charlton, and about a fortnight before the marrowfat. The sorts already specified, therefore, embrace the best for sowings made from the end of October till the middle of January, and for late crops, raised between the middle of June and the beginning of August. The Charltons and Hotspur may be sown in May for late fall crops; in June for a smaller supply; and in July along with the frames for the last returns."—*Loudon.*

Times of sowing.—"The dwarfs are generally employed in hot-bed culture, which, however, succeeds badly, and is neither worth preserving nor describing, and the less so, as early crops may be more certainly had by sowing in the fall, in sheltered situations, and covering during the winter with a layer of leaves, and another of long stable-litter loosely applied to keep the leaves in their places. After the earth takes a temperature favourable to vegetation, your pea sowings should be made once a fortnight, to keep up a regular and successive supply."—*Armstrong.*

Quantity of seed.—"Of the small, early kinds, one pint will sow a row of twenty yards; for the larger sorts, for main crops, the same measure will sow a row of thirty-three yards."

Process in sowing.—"For early sorts, make the drills

one inch and a half deep; and let parallel drills be two feet and a half, three or four feet asunder. Peas that are to grow without sticks require the least room. For summer crops and large sorts, make the drills two inches deep, and four, five or six feet asunder. As to the distances along the drill, distribute the peas according to their size, and the season: the frame, three in the space of an inch; the Charltons, Hotspur, and dwarf marrowfat, two in an inch; the Prussian blue, and middle-sized sorts, three in two inches; the large marrowfat and Knight's a full inch apart; the moratto, rouncivals, and most larger sorts, an inch and a half apart, and the Patagonian, two inches."

Soil and situation.—"The soil should be moderately rich, and the deeper and stronger for the lofty growers. Peas are not assisted, but hurt, by unreduced dung recently turned in. A fresh, sandy loam, or road-stuff, and a little decomposed vegetable matter, is the best manure. The soil for the early crops should be very dry, and rendered so, where the ground is moist, by mixing sand with the earth of the drills."—*Loudon.*

Armstrong says, "A loose and warm soil is most favourable to this vegetable, which, by the way, is neither improved in quality nor quantity by stable manure. The soil of Clichy, and of Point de Jour des Colombe, &c. in the neighbourhood of Paris, is a pure sand, principally devoted to pea crops, and yielding these most abundantly without the application of dung new or old."

Subsequent culture.—"As the plants rise from half an inch high to two or three inches, begin to draw earth to the stems, doing this when the ground is in a dry state, and earthing gradually higher as the stems ascend. At the same time, with the hoe, loosen the ground between the young plants, and cut down rising weeds. Early crops should be protected during hard frosts by dry straw, or other light litter, laid upon sticks or brush wood; but remove the covering as soon as the weather turns mild. If, in April, May, and the course of the summer, dry weather occurs, watering will be necessary, especially to plants in blossom and swelling the fruit; and this trouble will be repaid in the produce. Rows partly cut off may be made up by transplanting. In dry weather, water, and in hot weather, shade, until the plants strike. All peas fruit better for sticking, and continue longer productive, especially the larger sorts. Stick the plants, when from six to twelve

inches high, as soon as they begin to vine. Provide branchy sticks of such a height as the sort will require; for the frame and Leadman's dwarf, three feet high; for the Charlton and middle-sized, four or five feet; for the marrowfat and larger kinds, six or eight feet; for the rouncival, and for Knight's marrow-pea, nine or ten feet. Place a row of sticks to each line of peas, on the most sunny side, east or south, that the attraction of the sun may incline the plants towards the sticks. Place about half the number on the opposite side, and let both rows stand rather wider at top than at the ground. Some gardeners stop the leading shoot of the most early crop, when in blossom; a device which accelerates the setting and maturity of the fruit.

To forward an early crop.—"Sow or plant in lines from east to west, and stick a row of spruce-fir [or other evergreen] branches along the north side of every row, and sloping so as to bend over the plants, at one foot or eighteen inches from the ground. As the plants advance in height, vary the position of the branches, so as they may always protect them from perpendicular cold or rain, and yet leave them open to the full influence of the spring sun. Some cover during nights, and in severe weather with two boards, nailed together lengthwise, at right angles, which forms a very secure and easily-managed covering, but excludes light. A better plan would be to glaze one of the sides, to be kept to the south, and to manage such row-glasses, as they might be called, when over peas, beans, spinage, &c., as hand-glasses are managed, when over cauliflower; that is, to take them off in fine weather, or raise them constantly or occasionally by brick-bats, or other props, as the weather and the state of the crop might require."—*Loudon.*

Management of a late crop.—The best variety for this purpose is Knight's marrow-pea, which may be sown at intervals of ten days, from the beginning to the end of June. "The ground is dug over in the usual way, and the spaces to be occupied by the future rows of peas are well soaked with water. The mould upon each side is then collected so as to form ridges seven or eight inches above the previous level of the ground, and these ridges are well watered. The seeds are now sown in single rows, along the tops of the ridges. The plants grow vigorously, owing to the depth of soil and abundant moisture. If dry weather at any time set in, water is applied profusely once a week. In this way, the plants continue green and vigorous, resist-

ing mildew, and yielding fruit till subdued by frost."—*Hort Trans.* vol. ii.

To save seed.—"Like other vegetables, the pea is susceptible of considerable improvement, and by the simple means of marking the finest plants of each variety, and keeping them for seed. Wilson's frame, and the Knight pea, have been formed in this way, and afford sufficient proof of the *wonders* produced by a very small degree of observation and care."—*Armstrong.*

Field-culture of the pea.—The most common mode of sowing peas is broad-cast; but the advantages of the row-culture, in a crop so early committed to the ground, must be obvious. Loudon says, "In Kent, where immense quantities of peas are raised, both for gathering green, and for selling ripe to the seedsmen, they are generally sown in rows from eighteen inches to three feet asunder, according to the kind, and well cultivated between. Peas, laid a foot below the surface, will vegetate; but the most approved depth is six inches in light soil, and four inches in clay soil, for which reason they ought to be sown under furrow, when the ploughing is delayed till spring. Of all grain, beans excepted, they are in the least danger of being buried too deep."—*Loudon.*

Deane observed, that "For field-peas, land that is newly ploughed out of sward is generally accounted best; and land which is high and dry, and has not been much dunged. A light, loamy soil is most suitable for them; and if it abound with slaty stones, it is the better. But they will do in any dry soil. The manures that suit peas best, are marl and lime. Our farmers do not commonly allow a sufficient quantity of seed for peas, in broad-cast sowing. When peas are sowed thin, the plants will lie on the ground, and perhaps rot: when they are thick, the plants will hold each other up with their tendrils, forming a continued web, and will have more benefit of the air.

Insects and diseases.—The *Mass. Agricultural Repository*, for June, 1822, contains some remarks of the Hon. T. Pickering, relative to a bug or fly, (*bruchus pisi,*) which preys on the pea, in which he observes, that an effectual remedy for this evil is *late sowing;* but the hot sun of June will so pinch the vines of the late sown peas, that the crop will be small, unless the land be moist as well as rich. He then details some experiments, by which he concludes that this insect is limited to a certain period for depositing its eggs

and if the tender pods are not found till that period has passed, the peas will be free from bugs. Col. Worthington, of Rensellaer county, N. Y., "sowed his peas on the 10th of June, six years in succession, and a bug has never been seen in his peas. Whereas his neighbours, who have not adopted this practice, have scarcely a pea without a bug in it. He supposes the season for depositing the egg of the pea-bug is passed before the peas are in flower."—*Mem. of N. Y. Board of Agriculture*, vol. ii. p. 23. "The only insect that commonly injures our peas is a small brown bug or fly, the egg [or larva] of which is deposited in them when they are young, and the pods easily perforated. The insect does not come out of its nest till he is furnished with short wings. They diminish the peas in which they lodge nearly one half, and their leavings are fit only for the food of swine. The bugs, however, will be all gone out if you keep them to the following autumn. But they who eat buggy peas the winter after they are raised, must run the venture of eating the insects."—*Deane's N. E. Farmer.* The same writer recommends, when seed-peas are known or suspected to contain insects, to scald them a quarter of a minute in boiling water, spread them about, and sow them without delay. If any of the bugs should be in the peas, this scalding will destroy them; and the peas, instead of being hurt, will come up the sooner, and grow the faster.

Mildew is another evil attending peas, especially such as are sown late in the season. This disorder is supposed by Knight to be caused by "a *want* of a sufficient supply of moisture from the soil, with *excess* of humidity in the air, particularly if the plants be exposed to a temperature below that to which they have been accustomed." The remedy which he recommends is, to "give water rather profusely once a week, or nine days, even if the weather proves showery."—See *N. E. Farmer*, vol. i. p. 414.

Use.—The use of peas for soups, and other culinary purposes, is well known. They are likewise very serviceable in fattening hogs, for which purpose they should be harvested dry, and ground into meal. If the straw be forward in autumn, and has been harvested without injury, it will be little inferior to ordinary hay for feeding cattle.

"In boiling split peas, some samples, without reference to variety, fall or moulder down freely into pulp, while others continue to maintain their form. The former are called *boilers*. This property of boiling depends on the soil: stiff land, or sandy land that has been limed or marled,

uniformly produces peas that will not melt in boiling, no matter what the variety may be."—*Loudon.*

"When peas are sown before winter, or early in spring, they are very apt to be eaten by mice. To prevent this, soak the peas, for a day or two, in train oil, before you sow them, which will encourage their vegetation, and render them so obnoxious to the mice that they will not eat them."—*Domestic Encyclopedia.*

PEACH-TREE.—*Amygdalus Persica.*—The peach-tree is a native of Asia, and was first brought to Rome during the reign of the emperor Claudius.

Varieties.—Linnæus divides the *A. Persica* into two varieties; that with downy fruit, or the peach, and that with smooth fruit, or the nectarine. There are various instances on record, (*Hort. Trans.* vol. i. p. 103,) of both fruits growing on the same tree, even on the same branch; and one case has occurred of a single fruit partaking of the nature of both. *See further*, FRUIT.

All the varieties are continued by budding, and, as in all other cases, new ones are obtained by sowing the stones; in doing which, we ought not to forget, that, like oil-giving seeds in general, those of the peach require to be earthed as soon as they are separated from the pulp. In their second year, (if wall-trees are required,) such of them as are destined for stems are budded close to the earth; and if riders or standards are wanted, three, four, or six feet higher. In the spring following, the first shoots from these buds should be headed down to four, five, or six eyes, for the purpose of producing two upright and leading branches, and as many laterals, with which you begin to give to the head the form you intend it shall ultimately take.

"The standard is nearly the natural form of the tree; requiring no interposition of art, if we except the removal of dead, or dying, or superfluous limbs, and an occasional supply of wood, (if this be wanted,) to keep up a well-balanced head. It is also that form in which the tree succeeds best in hot climates; and in such it ought always to be employed. But, in northern latitudes, (where the heat is neither long continued nor great,) the fruit of the standard peach-tree is rarely seen in perfection; it may be large, and juicy, and well coloured, but it will always be deficient in that peculiar flavour, that aroma, which is its true characteristic, and without which it is but ordinary fruit. To supply, therefore, as far as may be possible, without the aid

of fire or glass, that high temperature in which the peach delights, we must recur, first, to the use of walls, which, besides protecting the tree from high and cold winds, concentrate the rays of the sun on its stem and branches, and on the earth which surrounds and nourishes its roots; second, to the amelioration of the soil, by giving to it both warmth and dryness, should it be deficient in these qualities; and, third, to the mode of training, which exposes to the light the greatest surface of leaf in the shortest space of time, and, consequently, best promotes an equal distribution of the sap. For accomplishing these three objects, the rules are, to construct your walls of stone, or brick, or wood, and of a height from twelve to fifteen feet; to lay out on the eastern and southern sides a border ten feet wide, worked to the depth of three feet, and manured with a mixture of ashes and peat, or bog earth; to plant in this (two and a half feet distant from the wall) your young trees, furnished with two leading branches, and presenting a figure not unlike the letter Y; to bring down those branches to a position nearly horizontal, and subsequently to train them upwards, parallel to each other, as high as the top of the wall, and directly against its side, to which, throughout their whole length, they are to be fastened by woollen straps; and, lastly, to encourage side shoots from these leaders, so as to fill up with bearing wood the intermediate space between them, and such exterior space on the wall as may be thought proper and practicable. To this form is given the technical name of the *wavy* or *curvilineal fan*, and it is obvious, that, in preserving, as well as producing it, the use of the knife cannot be dispensed with. Be careful, therefore, in May and June, and, occasionally, in the succeeding months, to remove water-shoots, and all ill-placed, redundant and diseased buds; and, again, at the fall of the leaf, to cut away, with a sharp knife, and close to the branches on which they grow, such new shoots as will not readily accommodate themselves to your design, or as may be unnecessary to it, and also all such old wood as may be useless or troublesome.

"The general rules for thinning leaves and fruit must be carefully observed in the treatment of peach-trees and nectarines, as they are known to have an uncommon degree of proneness to overbearing, and as the discipline we recommend will, besides giving an improved fruit, tend directly and greatly to fortify the trees against the attacks of their

numerous enemies. Of these, the *acarus*, *chermes*, *aphis* and *thrips*, (an insect hardly perceptible to the naked eye,) are the most common, and are best expelled by water and tobacco smoke. It is, however, the curculio, or grub, (as we call it,) that may, from its pre-eminence in mischief, be regarded as the destroyer of the peach. Its attacks, ordinarily, begin in the stem, near the surface of the earth; and, if not arrested, will soon terminate in the roots, where it riots on the gum exuding from the wounds it inflicts. The remedies resorted to in this case are, first, the application of boiling water to the roots; second, a similar application of unslaked lime, in the proportion of one quart to a tree; third, removing the surface earth, and substituting for it tanners' bark; fourth, removing the earth, as in the preceding case, in the month of November, and exposing the roots to the action of frost during the winter; and, fifth, encircling the lower part of the stem with straw, and thus compelling the insect to begin his attack so far from the ground, that he will be unable to avail himself of its shelter before the coming on of winter.

"The diseases of the peach-tree are as numerous, and often as fatal, as the depredators just mentioned; and are known to horticulturists under the names of the honey-dew, mildew, canker, spots, &c. The first of these yields to the flour of sulphur, sprinkled over the tree; but the most efficient cure for all of them is the removal of the soil about their roots."—*Armstrong's Treatise on Gardening.*

The following is from the *Domestic Encyclopedia*, last Philadelphia edition :—

"Peach-trees are liable to three casualties :

"1. The fly that deposits eggs near the root, and there forms a worm.

"2. The bursting of the bark by severe frosts in wet winters.

"3. The splitting of the limbs at the fork of the tree.

"The fly, which is blue, (but not a wasp,) begins its attacks about the middle of July, and continues its depredations until the middle of September. It wounds the tender part of the bark, and *generally* at the surface of the ground, there depositing its eggs, which hatch into worms, that prey upon the mucilage and tender part of the bark, until the communication between the root and the branches is cut off, causing the death of the tree. To guard against this, raise a little hillock in the month of June, round the

tree, about a foot high, so as completely to cover that part of the bark kept moist and tender at the surface of the ground. This hillock will not stand so long at one height, as to tender the bark above, as the rain will gradually wash it down level with the surface; and it must be raised again every summer.

"To take out the worm, the roots must be uncovered, and the spot looked for where the gum oozes out, following the cavity round with the point of a knife, till you come to the solid wood, and lay the whole open: the worm will be found with a white body and black head; which must be destroyed, and the holes carefully filled up with cow manure, rendered adhesive by sand, or lime and ashes, as directed by Forsyth.

"Soap-suds, heated after a family wash, and poured on the roots of trees about the middle of August, have been used with success in destroying the eggs or the young worm.

"'According to Mr. John Ellis, of New Jersey, the injury arising from the worm may be prevented in the following way:

"In the spring, when the blossoms are out, clear away the dirt, so as to expose the root of the tree, to the depth of three inches; surround the tree with straw about three feet long, applied lengthwise, so that it may have a covering one inch thick, which extends to the bottom of the hole, the but-ends of the straw resting on the ground at the bottom; bind this straw round the tree with three bands, one near the top, one at the middle, and the third at the surface of the earth; then fill up the hole at the root with earth, and press it closely round the straw. When the white frosts appear, the straw should be removed, and the tree remain uncovered, until the blossoms put out in the spring.

"'By this process, the fly is prevented from depositing its egg within three feet of the root; and, although it may place the egg above that distance, the worm travels so slow that it cannot reach the ground before frost, and therefore is killed before it is able to injure the tree.

"'The truth of the principle is proved by the following fact. I practised this method with a large number of peach-trees, and they flourished remarkably without any appearance of the worm for several years, when I was induced to discontinue the straw with about twenty of them. *All those which were without the straw have declined, while*

the others, which have had the straw, continue as vigorous as ever.' *

"To guard against frost, plant the trees where the water will run off, and procure the sweetest and richest fruit, as the inferior qualities are more injured by the cold.

"The splitting of the tree at the forks is guarded against by preserving as many upright branches as can be spared, by breaking off, in bearing years, more than half the quantity of fruit while small, and by pruning almost the whole of every branch beyond where the fruit is set, leaving only a few buds on each of the succeeding year's fruit. The size of the fruit is by these means rendered larger, more beautiful, and of a higher flavour, and the growth of the tree is rendered more vigorous.

"Mr. Thomas Coulter, of Bedford county, Penn., asserts that 'The principal causes of peach-trees dying while young are the planting, transplanting and pruning the same stock; which causes the stock to be open and tender, and the bark of the tree very rough: this roughness of the bark gives opportunities to insects to lodge and breed in it; and birds search after these insects for their support, and with their sharp bills wound the stock in many places; from which wound the sap of the tree is drawn out, which congeals, and never fails to kill, or to render the tree useless in a few years. To prevent which, transplant your peach-trees, as young as possible, where you mean them to stand; if in the kernel, so much the better; because, in that case, there will be no check of growth, which always injures peach-trees. Plant peach-trees sixteen feet apart, both ways, except you would wish to take your wagon through the orchard to carry the peaches away; in that case give twenty-four feet distance to every fifth row, one way, after transplanting. You may plough and harrow amongst your peaches for two years, paying no regard to wounding or tearing them, so that you do not take them up by the roots. In the month of March or April, in the third year after transplanting, *cut them all off by the ground;* plough and harrow amongst them as before, taking special care not to wound or tear them in the smallest degree, letting all the sprouts grow, that will grow; cut none away, supposing six or more should come up from the old stump; the young scions will grow up to bearing trees on account of the

* Dr. Thacher observes, that "A band of matting, extending about six inches above, and the same beneath the surface of the earth, may be found preferable to straw, as it is easier applied."

roots being strong. Let no kind of beasts into a peach-orchard, *hogs excepted*, for fear of wounding the trees; as the least wound will greatly injure the tree, by draining away that substance which is the life thereof: although the tree may live many years, the produce is not so great; neither is the fruit so good. After the old stock is cut away, the third year after transplanting, the sprouts or scions will grow up all round the old stump, from four to six in number; no more will come to maturity than the old stump can support and nourish; the remainder will die before ever they bear fruit. These may be cut away, taking care not to wound any part of any stock, or the bark. The sprouts growing all round the old stump, when loaded with fruit, will bend, and rest on the ground in every direction, without injuring any of them, for many years, all of them being rooted in the ground as though they had been planted. The stocks will remain tough, and the bark smooth, for twenty years and upwards. If any of the sprouts or trees from the old stump should happen to split off, or die, cut them away; they will be supplied from the ground by young trees, so that you will have trees from the same stump for one hundred years, as I believe. I now have trees, thirty-six, twenty, ten, five, and down to one year old, all from the same stump. The young trees, coming up, after any of the old trees split off or die, and are cut away, will bear fruit the second year: but this fruit will not ripen so easily as the fruit on the old trees from the same stem. Three years after the trees are cut off by the ground, they will be sufficiently large and bushy to shade the ground, so as to prevent grass of any kind from matting or binding the surface so as to injure the trees; therefore ploughing is useless, as well as injurious; useless, because nothing can be raised in the orchard, by reason the trees will shade all the ground, or nearly so; injurious, because either the roots, stock, or branches will be wounded; neither is it necessary ever to manure peach-trees, as manured trees will always produce less and worse fruit than trees that are not manured; although by manuring your peach-trees they will grow larger, and look greener and thicker in the boughs, and cause a thicker shade, yet on them will grow very little fruit, and that little will be of a very bad kind—generally looking as green as the leaves, even when ripe, and later than those that have never been manured." *

* This assertion is directly contrary to the experience of a gentleman in New Jersey, who has remarkably fine peaches, regularly manures his trees every

Professor Say, of Philadelphia, has given the following scientific description of the peach-insect:—

"*Ægeria exitiosa.*—MALE.—Body, steel blue: *antennæ*, hairy on the inner side, black, with a tinge of blue: *palpi* beneath, and basal band of the head above and beneath, pale yellow: *eyes*, black brown: thorax, with two pale yellow longitudinal lines, and a transverse one behind, interrupted above; a spot of the same colour beneath the origin of the wings; *wings*, hyaline, nervures and margin steel blue, more dilated on the costal margin and anastomosing band of the superior wings: *feet coxæ*, two bands on the tibia, including the spines: incisures of the posterior tarsi, and anterior tarsi behind, pale yellow: *abdomen*, with two very narrow, pale yellow bands, of which one is near the base, and the other in the middle: *tail*, fringed, the fringe margined with white each side.—Length, to the tip of the tail, more than three fourths of an inch.—Length, to the tip of the wings, one tenth of an inch shorter.

FEMALE.—Body, very dark steel blue, with a tinge of purple: *palpi* beneath, black: thorax, immaculate: *inferior wings*, hyaline, with an opaque margin, and longitudinal line; the latter, and the costal margin, are dilated: *tergum*, with the fifth segment bright fulvous.—Length, seven tenths of an inch.

"The PUPA has two semifaciæ of spines upon each of the segments, excepting the three terminal ones, which have a single row only.

"The FOLLICLE is brown, oblong-oval, and is composed of small pieces of bark and earth, closely connected together by the web of the animal.

"The very great disparity of markings between the sexes of this destructive species, would lead us to hesitate in admitting their identity, if we were not aware that, in this genus, the males and females, in several instances, differ exceedingly from each other. In the present instance, this difference is so great as to render it difficult to construct a specific character which shall distinguish them from all others of the genus. After a careful examination of entomological works, I have not been able to find any notice whatever of this species. I therefore describe it as new."
—*Journal of the Academy of Sciences.*

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year, and asserts that the speedy decay of common peach-trees is owing chiefly to a neglect of the practice. He even said experience convinced him it was owing to the same circumstance that peach-stones did not, in general, produce fruit like the original tree.

Dr. Thaddeus W. Harris has written a paper on this insect, which was published in the *N. E. Farmer*, vol. v. p. 33, and observes, that "One of the first writers who described the peach-tree insect was the late Dr. Benjamin Smith Barton, the celebrated botanist, and professor of natural history in the university of Pennsylvania. In his memoirs on various destructive insects, which obtained the Magellanic premium, in 1806, from the Philosophical Society of Philadelphia, this insect is called *Zygæna Persicæ*." Dr. Harris also observes, "he" (Dr. Barton) "having first described this insect, the name which he has imposed has the priority, and must be retained."

"This insect," continues Dr. Harris, "I first obtained in the perfect state in July, 1823, and sent a description of it to Hon. John Lowell. It is a remarkable coincidence, that the name which I then gave it is the same as that given by Dr. Barton, although I was then unacquainted with his account of it. I also obtained a specimen of the male from an excrescence on the trunk of a cherry-tree, and have frequently observed the larvæ in those tubercles which deform the limbs of that tree.

"The females deposit their eggs, in the month of August, on the trunk of the peach-tree, near the root; the eggs are soon hatched, and the larvæ immediately penetrate beneath the bark. Some eggs are laid as late as the last of September.

"The precautions which I would recommend are, to remove the earth around the roots, carefully to search it and the trees for any cocoons or larvæ which may exist there, which should be crushed or burned. This operation should be commenced early in this month [August.] Then cover the trunk with the common composition, or wash and surround it with coarse paper, such as is used for sheathing, and which is manufactured from junk, or old cordage. This is to be properly secured by strings of Canton matting, and should extend two or three inches below the surface of the ground, and six or seven inches above it. Mortar may now be placed round the roots, so as to confine the paper, and prevent access beneath it, and the remaining cavity filled with fresh loam. The strings may be removed after the winter commences; in the spring the tree should again be searched for any of the larvæ, which may have escaped at first, and the application of the composition and loam be renewed.

"In getting out the caterpillar, we should be sparing in

the use of the knife; a piece of wire will often answer the purpose quite as well, and does not wound the bark."

Mr. Wilson, of New York, in his *Economy of the Kitchen Garden*, &c., a valuable work, lately published, says, "Grafting-clay, applied to the bark of trees, does not injure the circulation, and, if the stems of peach-trees were enveloped with a thin coat of it, I am persuaded no worm could hurt them. If properly prepared and applied, it adheres to the stem, or any other part of a tree, with great tenacity, until expanded and broken by the frosts and thaws of winter. It is made in the following manner:—Take three parts of any kind of clay, free from stones, the stiffer the better, one part of horse-dung, free from straws, and one part of fresh, but not thin, cow-dung; mix and incorporate the whole well together, adding a sufficient quantity of water to render it of a consistency of good, stiff mortar; beat and work it thoroughly with the spade, till it becomes as smooth and tough as putty. It will then be fit for applying round the stem of your tree, and should be neatly clapped on it by the hands."

The same writer attributes the degeneracy of peach-trees, so far as it is real, to the cultivation of old sorts, and observes, that "Budding or grafting from old trees, upon new stocks, raised from seed, although it is the means of affording a fresh supply of vigorous nourishment to the scion of the old sort, which is to form a new tree, is still only a new mode of the continuation of the same individual;" and advises, in substance, either to bud or graft from new sorts, on seedling stocks, or to raise young trees from seedlings, produced from seeds of healthy, young, or middle-aged trees, which are not of a worn-out variety.

Mr. Wilson, moreover, observes, "Great mischief is frequently done by cutting off the tops of peach-trees, when they are first set out. If they are furnished with good heads, as they always ought to be, before they are taken from the nursery, no other pruning should be given them at setting out, except the moderate retrenching of any very irregular shoots, and this should be done at the time the buds begin to expand; and the chief pruning they require afterwards is, to keep their heads moderately open by cutting out such branches as crowd upon or interfere with each other."

Mode of bearing.—"All the varieties of the peach and nectarine bear the fruit upon the young wood of a year old; the blossom buds rising immediately from the eyes of the

shoots. The same shoot seldom bears after the first year, except on some casual, small spurs, on the two years' wood, which is not to be counted upon. Hence the trees are to be pruned, as bearing entirely on the shoots of the preceding year; and a full supply of every year's shoots must be trained in for successional bearers.

Thinning the fruit.—"In favourable seasons, the blossoms often set more fruit than they can support, or than have room to attain full growth; and if all were to remain, it would hurt the trees in their future bearing; therefore they should be timely thinned, when of the size of large peas, or half-grown gooseberries. There should be a preparatory thinning at the time of stoning, and a final thinning afterwards, because most plants, especially such as have overborne themselves, drop many fruit at that crisis. Finish the thinning with great regularity, leaving those retained at proper distances, three, four, or five, on strong shoots, two or three on middling, and one or two on the weaker shoots; and never leaving more than one peach at the same eye. The fruit on weakly trees thin more in proportion."—*Abercrombie*

Use.—The use of the peach, as a dessert-fruit of the first order, is too well known to require observation. In several of the Southern States, a sort of brandy is made from this fruit. This liquor, however, though highly flavoured, is said to be unwholesome.

The following mode of drying peaches has been practised by Thomas Belangee, of Egg Harbour, New Jersey:—

He has a small house, with a stove in it, and drawers in the sides of the house, lathed at their bottoms. Each drawer will hold nearly half a bushel of peaches, which should be ripe, and not peeled, but cut in two, and laid on the laths, with their skins downwards, so as to save the juice. On shoving the drawer in, they are soon dried by the hot air of the stove, and laid up. Peaches, thus dried, eat like raisins. With a paring-machine, which may be had for a dollar or two, apples or pears may be pared, and a sufficient quantity dried, to keep a family in pies, and apple-bread and milk, till apples come again. With a paring machine, one person can pare for five or six cutters.

PEAR-TREE.—*Pyrus communis.*—The pear-tree is found in a wild state in Europe as far north as latitude 51°. It grows in almost any soil, and seems to be quite at home in New England. In a dry soil (according to Loudon) it

will exist for centuries, and still keep in health, productiveness and vigour.

Propagation.—"The pear may be propagated by layers or suckers, but not easily by cuttings. These modes, however, are productive of very indifferent plants, and are justly rejected in favour of raising from seed, and grafting or budding.

"*From seed.*—This mode is adopted either for the purpose of obtaining new varieties, or for producing pear-stocks. The manner of procuring seedlings is the same as directed for the apple-tree, page 17. Professor Van Mons, proprietor of the *Pépinière de la Fidelité*, at Brussels, has upwards of eight hundred approved sorts of new pears, raised from seed by himself, and M. Duquesne, of Mons, in the course of fifteen or sixteen years, and selected from probably eight thousand new seedling fruits. Van Mons observed to Neill, that he seldom failed in procuring valuable apples from the seed; for those which were not adapted to the garden as dessert-fruit, were probably suited for the orchard, and fit for baking, or cider making. With pears the case was different, many proving so bad as to be unfit for any purpose.—*Horticul. Jour.*, &c. 309. Whenever a seedling indicates, by the blunt shape, thickness, and woolliness of its leaves, or by the softness of its bark and fulness of its buds, the promise of future good qualities as a fruit-bearing tree, Van Mons takes a graft from it, and places it on a well established stock: the value of its fruit is thus much sooner ascertained.—*Horticul. Jour.*, &c. 310. At Brussels, seedlings yield fruit in four or five years; in Britain, seldom before seven or ten years have elapsed. The fruit of the first year of bearing is always inferior to that of the second and third years. If a pear or an apple possess a white and heavy pulp, with juice of rather pungent acidity, it may be expected in the second, third, and subsequent years, greatly to improve in size and flavour. New varieties of pears, and indeed of all fruits, are more likely to be obtained from the seeds of new than of old sorts.—*Horticul. Jour.*, &c. 308, 309.

"As the varieties of the pear do not reproduce themselves from the seed; as the plants furnished by layers, cuttings, and suckers, are very indifferent; and as seedlings are slow in giving their fruit; it follows, that the pear is principally propagated by scions and buds. These are placed on pear or quince stocks, according as taste or interest may invite to early and small crops of fine quality, or to later and more abundant ones of inferior character. In the for-

mer case, the stem of the quince must be employed; and in the latter, that of the common pear, and without any material difference in the operation, excepting that 'the feebler the stem, the nearer to the earth should be placed the scion or the bud.'

"Notwithstanding the hardiness ascribed to the pear-tree, we know not any of the kernel class more readily or sensibly affected than it by particular conditions of the atmosphere. A moist and cold spring, a wet summer, and a rainy autumn, are alike unpropitious to it. In either of these cases, the fruit which does not rot is watery and tasteless; and when all take place, the evil extends to even a second year; as, according to the observations of Coursette, 'long continued moisture rarely fails to convert fruit buds into wood buds.'

"The second year after budding or grafting, the plants may be removed to the places where it is intended they shall stand; and as the manner and time of doing this do not differ from those prescribed for the apple-tree, we may spare ourselves and our readers the trouble of a repetition of our directions on those heads.

"With respect to exposition and soil, though the pear-tree may be made to grow any where, still it will succeed badly on the north sides of hills, or in stiff, dry soils, and still worse on those which rest on a wet sub-soil. Some of its later and finer varieties require and deserve a deep substantial loam, occasionally refreshed with a dressing of well rotted dung, and some of the best aspects the garden can furnish.

"Cultivated as standards and pyramids, the young trees should be left, in a great degree, to regulate their own shape,* and if interference become proper at all, it should be conducted—'to keep the middle of the head pretty open, and the sides well balanced.'† Trees of other forms, and intended for walls and espaliers, require more labour and management, and a degree of both summer and winter pruning: the former of which consists in rubbing off all fore-right, ill placed, superfluous, or spongy shoots, before they become so hard as to render the use of the knife necessary; while the latter (performed during any temperate weather between November and April) is con-

* Knight remarks, that, in general, very little pruning is required for pear-standards or pyramids; but that there are sorts which form heads resembling those of apple-trees, and that for these pruning may be beneficial.

† To produce a well balanced tree, shorten the wood of the deficient side, and leave the other to itself.

ducted on the general rule 'of sparing all such well placed and thriving laterals, as may be necessary for preserving the form given to the head of the tree, and of cutting away all others close to the branch from which they grow.' If the older wood be diseased or redundant, cut this away also, or shorten it down to some healthy and promising shoots. The retained branches, if growing against a wall or trellis, should, after each pruning, be laid down and nailed, with as much extension as can conveniently be given to them.

"Mr. Knight's mode of training the pear-tree is, to leave on the young stock two lateral branches on each side. When about six feet high, he transplants the tree early in the spring, and inserts grafts on each side of the laterals, so that two of them shall push from the stem about four feet from the ground, and two others from the summit, the ensuing year. The shoots produced by these grafts, when about a foot long, are to be trained downward—the lower ones almost perpendicularly, and the upper ones just below a horizontal line; and so placed, as to distance, that the leaves of the one will not at all shade the other. Continue this mode of training the second year, and in the third you may expect an abundant crop of fruit.

"When an old tree becomes unproductive, one of two methods should be adopted—either to cut down within eighteen inches or two feet from the ground, and train up anew some selected shoots which may have pushed from the stump, (which is the method of Forsyth,) or, to take off at its base every branch which does not want at least twenty degrees of being perpendicular, and all spurs from such other branches as by this rule will be left. Into these, (the retained branches,) at their subdivisions, and at different distances from their bases, quite to their extremities, grafts must be carefully inserted; which, when they attain sufficient length, (say twelve inches,) must be trained downward between the branches, as directed in the preceding paragraph."—*Armstrong.*

The diseases of the pear-tree, and the insects which infest it, are in general the same with those to which apple-trees are liable. Soft soap is said to be an excellent application to the stem and limbs, preventing the decline of the tree, and causing the bark to become smooth and glossy. A solution of potash, as recommended for the apple-tree, (page 222,) would no doubt prove equally useful to this tree. Pear-trees have of late years been subject to a malady,

by some supposed to be fire-blight, but by others attributed to an insect called *Scolytus pyri*. During the months of June and July, the extreme branches turn black, as if scorched. The disorder extends downwards to the larger limbs, and continues to increase, till, in some instances, the tree is entirely destroyed. It is sometimes so rapid in its progress, that, in a few hours from its first appearance, the whole tree will appear to be mortally diseased, and all its foliage withered or withering. A writer in the *New England Farmer*, vol. ii. p. 42, says, that, on the first appearance, of this disease, "I instantly sawed off all the limbs affected, and proceeded to examine them. I found at last the enemy, not *at the point* where death ensued, but some inches below it. The insect was very small, and apparently incapable of such extensive mischief, but the effect was certain, and the manner of producing that effect was obvious. It had eaten a complete circle of the alburnum, or sap wood, not exceeding the size of a knitting needle, so as completely to intercept the passage of the sap." This insect the writer exhibited to Professor Peck, whence arose his account of it, first published in the *Mass. Agr. Repos.*, and republished, together with a cut of the insect, in the *N. E. Farmer*, vol. v. p. 2. The late Professor Peck observed, that the mischievous effects of this minute insect may be observed in June and July, and that the dead part of the branches should be cut off, and burnt without delay. The writer above referred to says, that, by steadily pursuing the system of cutting off the limbs many inches below the apparent injury, and burning them, the insects have been extirpated from his estate.

Some writers attribute the sudden decay of the pear-tree to the overpowering rays of the sun. Others say that a warm winter sets the sap in motion, which a cold spring arrests, and causes it to stagnate and become corrupt in the pores of the alburnum. Others are of opinion that manuring too high, and pruning too much, causes the tree to die of a *plethora* or *surfeit*. The remedy, however, is not a subject of so much dispute. In all cases of blight, the only cure or palliation of the disorder is found in sawing off the affected branches, some inches below where the blight appears.

Use.—"As a dessert fruit the pear is much esteemed, and generally preferred to the apple. It is also used for baking, *compotes*, marmalade, &c. Pared and dried in the oven, the fruit will keep several years, either with or without sugar. This mode of preparing the pear is about as

common in France, as the making of apple-pies is in Britain, and what is favourable to the practice is, that bad eating sorts answer best for drying. The wood of the pear-tree is light, smooth, and compact, and is used by turners, and to make joiners' tools, picture-frames to be dyed black, &c. The leaves will produce a yellow dye, and may be used to give a green to blue cloth."—*Loudon.*

PEPPER, RED.—*Capsicum.*—This plant requires a warm, rich soil, and a favourable exposition. The seeds may be placed in rows, three feet apart, or in hills, at that distance from each other. In dry weather they will need watering, and should be kept clear of weeds by frequent hoeing. The seeds are best preserved by running a string through the pods, and hanging them in a dry place.

Use.—"Pepper is an excellent spice, which should always be coarsely ground, and eaten only with fat, smoked, or tough animal food; with cabbages, cucumbers, and other flatulent and cold vegetables; and likewise with fish, and all substances that are difficult to be digested. On the continent of Europe, this spice is highly esteemed for its efficacy in relieving flatulency, weak, or impaired digestion, and the giddiness which generally accompanies the complaint last mentioned. For this purpose, from six to ten grains are directed to be swallowed every morning, previously to taking food; such practice, however, ought to be adopted only in cases where the stomach is in a high degree vitiated, or the patient has been habituated to the free use of spices and spirituous liquors."—*Dom. Encyc.*

PLUM-TREE.—*Prunus domestica.*—This tree is found growing wild in Great Britain and other parts of Europe; but its native country is supposed, by European writers, to be Syria, in Asia. It is also indigenous in North America, and a wild kind, found in the woods of Vermont, grows large and fair, but its fruit contains little saccharine matter. No doubt it might be improved by culture, and may furnish stocks for grafting. Some of the most approved varieties are enumerated under the head FRUIT, p. 136.

Soil and cultivation.—Plums, according to Miller, should have a middling soil, neither too wet and heavy, nor over light and dry. Armstrong recommends argillaceous soils, not very wet nor very dry. "Where, from previous culture, or accidental causes, the earth becomes either very rich or very poor, the tree does not succeed. In the one case, its vigour is directed only to the production of wood and foliage; and in the other, its growth is feeble, and its

life short. In favourable climates, it should always be cultivated as a standard, and will then require only a little annual labour about the roots, and the removal from the head of dead or dying branches; but, in northern latitudes, and cold situations, the espalier form, (as practised near Paris,) may be not only useful, but indispensable. This differs in nothing from the ordinary mode, but in pruning *less severely*. The cultivators at Montreuil, instead of shortening the branches to three or four eyes, leave them fifteen or twenty feet long, and lay them down in such a way as shall soonest and most completely enable them to cover the frame to which they are attached.

"With regard to product, '*few* and *fine*' is the general maxim. The thinning discipline must not, therefore, be omitted; because it is that which will best fulfil both parts of the rule."

Diseases.—The gum and canker are the diseases most common to plum-trees, for which, heading down is prescribed as the best remedy. Plum-trees are also annoyed by an insect, described, by Professor Peck, in the *Mass. Agr. Repository* for 1819, and by him denominated *Rynchænus cerasi*. The insect causes tumors, or irregular, black lumps, which deform the bark, and occasion the premature fall, not only of plums, but peaches and apricots. "The evil," according to Professor Peck, "produced by this insect, cannot be wholly remedied; but something may be done to diminish the mischief, by cutting off the diseased branches." They should, according to his directions, be cut off the last half of June, and burnt immediately.

Mr. R. Toohey, gardener, of Waltham, Mass., recommends the following composition for destroying insects, which infest plum-trees:—

"Take of tobacco-juice one gallon, this may be had of the tobacconists, or you may make it, by putting some tobacco in warm water, (not boiling, as that will take off a great part of the oil;) oil of tar, one quart; train oil, one quart; soft soap, one and a half pound; and a quarter of a pound of soot. Beat the oils together first, and then the soap and soot, till well united; then pour them all into the tobacco-juice, stirring them gently together. When the liquid is cold, it is fit for use. It should be applied with a common paint-brush, in the latter end of March, or first of April.

"Previous to applying the mixture, I should recommend pruning, and, when the trees are very much affected with

the above-mentioned disease, heading down at *a*, *b*, *c*, *d*, *e*, or *f*, according to the size of the trees; if any of the ulcers should remain after pruning or heading down, they must be entirely removed from the tree, and then apply the composition."—*N. E. Farmer*, vol. vi. p. 274.

POTATO.—Sir Joseph Banks (*Hort. Trans.* i. 8) considers that the potato was first brought to Spain from the mountainous parts of South America, in the neighbourhood of Quito. To England, however, this root found its way by a different route, being brought from Virginia by the colonists sent out by Sir Walter Raleigh, in 1586.

Varieties.—These are very numerous, not only from the facility of procuring new sorts by raising them from seed, but because any variety cultivated for a few years, in the same soil and situation, as in the same garden or farm, acquires a peculiarity of character and habit, which distinguishes it from the same variety in a different soil and situation. Dr. Hunter, in his *Georgical Essays*, has supposed the duration of a variety is limited to fourteen years: and Knight concurs with him in opinion. Potatoes, which are excellent in Ireland, Nova Scotia, and other high northern latitudes, do not answer a good purpose in New England. The potato taken from the south prospers better, such as the River Plate, or long red potato, which has succeeded well in Massachusetts. Loudon asserts, that the best mode to order potatoes for seed is, to give a general description of the size, colour, form, and quality wanted, and whether for an early or late crop, without being guided by the names attached to any varieties.

Propagation.—The potato may be propagated from seed, cuttings, or layers of the green shoots, sprouts from the eyes of the tubers, [roots,] or portions of the tubers containing a bud or eye, or by planting the tubers whole. The object of the first method is to procure a new or improved variety; of the second, little more than curiosity, or to multiply, as quickly as possible, a rare sort; and of the third, to save the tubers for food. The methods, by portions of the tubers, [the roots cut in pieces,] or whole potatoes, are the best, and almost universally practised, for the general purposes both of field and garden culture.

By seed.—"Take the apples, in the beginning of October, [or whenever they are ripe,] before the frost has hurt them; hang them up by the foot stalks, in a dry closet, where they will not freeze; let them hang till March, or April; then mash the apples, wash the seeds from the pulp,

and dry them in a sunny window. Sow the seeds in a bed about the first of May. When the plants are four or five inches high, transplant them into ground well prepared, one or two plants in a hill."—*Deane.* Seeds from the same ball will produce a great variety of kinds, some of which may be of little value; and in order to make the most of such experiments, it will be well to proceed according to the following directions, extracted from some remarks by Col. Pickering, contained in a pamphlet published by the Essex Agricultural Society, Mass.; this society having awarded premiums for the best potatoes raised from the seed.

1. "Seeing the seeds in the same ball will produce various sorts of potatoes, it will be indispensably necessary, that each young plant grows at the distance of eight or ten inches apart.

2. "In autumn, or as soon as the vines or stems of the plants die, and the young potatoes are dug up, those of each plant are to be saved by themselves, and it will be easy to put each sort in a separate paper bag. Those potatoes will be very small, perhaps from the size of a pigeon's down to a sparrow's egg.

3. "In the ensuing spring, the potatoes of each sort, that is, the potatoes of each bag, must be planted by themselves; and, if not in distinct rows, then stakes, driven into the ground, should mark the divisions of the several sorts in the same rows, leaving a space of about two feet between one sort and another, to guard against any mixture.

4. "In the time for harvesting them in the second year, the potatoes [if grown in a good soil] will be large enough to be boiled, to ascertain their quality. Each sort must be tried by itself. Such as are watery, and ill flavoured, may be at once thrown aside, for the use of live stock. Every other sort, so valuable as to be thought worth cultivating, must be kept unmixed, by putting each kind in a separate bag or cask."—*N. E. Farmer*, vol. vi. p. 286.

The modes of propagating by layers, cuttings of the vines, suckers, sprouts, &c., are rather curious than useful, and are therefore here omitted, but may be seen in detail in the *Encyc. of Gard.* p. 620.

By portions of the tubers, [or cuttings of the roots.]—"In making the sets or sections, reject the extreme or watery end of the tuber, as apt to run too much to haulm, [vine,] and having the eyes small, and in a cluster; reject also the root, or dry end, as more likely to be tardy in growth, and

produce the curl. Then divide the middle of the potato, so as to have not more than one good eye in each set. When the potato-scoop [an instrument for digging out the eyes of potatoes] is used, take care to apply it so as the eye or bud may be in the centre of each set, which this instrument produces, of a semi-globular form. The larger the portion of tuber left to each eye, so much the greater will be the progress of the young plants."—*Loudon.*

By some experiments which were made by J. Whitlaw, Esq., and given in detail in the *N. E. Farmer*, vol. i. p. 53, and vol. iv. p. 314, these two important facts were made apparent: 1st. Large potatoes are much better for seed than small ones. 2d. It is best to cut off the but and top-ends from each potato, and cut the middle pieces into quarters, before planting. Knight, the famous English horticulturist, has found, that, for a late crop, small *sets* [seed potatoes] may be used; because the plants of the late varieties always acquire considerable age before they begin to generate tubers; but for an early crop, he recommends the largest tubers; and he has found, that these not only afford very strong plants, but also such as readily recover when injured by frost; for, being fed by a copious reservoir beneath the soil, a re-production of vigorous stems and foliage soon takes place, when those first produced are destroyed by frost or other cause. He adds, "When the planter is anxious to obtain a crop within the least possible time, he will find the position, in which the tubers are placed to vegetate, by no means a point of indifference; for these, being shoots or branches which have grown thick instead of elongating, retain the disposition of branches to propel the sap to their leading buds, or points most distant from the stems of the plants of which they once formed parts. If the tubers be placed with their leading buds upwards, a few very strong and very early shoots will spring from them; but if their position be reversed, many weaker and later shoots will be produced; and not only the earliness, but the quality of the produce, in size, will be much affected."—*Hort. Trans.* iv. p. 448.

M'Mahon advises to cut seed potatoes "a week before planting, in order that the wounds should have time to form a dry crust; for, if planted immediately after being cut, they imbibe too much moisture, many of them rot, and the rest are greatly weakened thereby." Some advise to wet seed potatoes, and roll them in pulverized plaster of Paris, immediately before planting.

From an experiment made by a person in the employ of the Hon. Josiah Quincy, the particulars of which are given in *Mass. Agr. Repos.* vol. v. p. 64, it appears that the product of certain rows, planted with *whole* potatoes, exceeded an equal extent of adjoining rows *more than one third.* A writer for the *N. E. Farmer*, vol. i. p. 330, gives an experiment, which tends to the conclusion that potatoes planted whole produce more than those which are cut. The experiments of most cultivators, however, are in favour of cutting. Dr. Cooper, in the last Philadelphia edition of *Willich's Domestic Encyclopedia*, says, "The best mode [with regard to seed potatoes] appears to be this:—choose your potatoes for planting of a moderate size, rather large than small, for there is no good reason to be assigned for breeding from diminutive parents; cut your potatoes into sets, two eyes to a set; throw away, without hesitation, into the hog-trough, all the inferior and diminutive eyes, choosing your sets from the middle of the potato; do not cut the potato down the middle." Loudon observes, "In preparing the sets of potatoes, some cultivators recommend large sets, others, small potatoes entire. Others, on the ground of experience, are equally strenuous in support of small cuttings, sprouts, shoots, or even only the eyes or buds. With all these different sorts of sets, good crops are stated to have been raised, though tolerable-sized cuttings of pretty large potatoes, with two or three good eyes or buds in each, are probably to be preferred. A very slight exercise of common sense might have saved the advocates of shoots, scooped-out eyes, &c., their experiments and arguments, it being evident, as Brown has observed, to every one that has any practical knowledge of the nature of vegetables, that the strength of the stem in the outset depends, in direct proportion, upon the vigour and power of the set. The set, therefore, ought to be large, rarely smaller than the fourth part of the potato; and, if the root is of small size, one half of the potato may be profitably used. At all events, rather err in giving over-large sets, than in making them too small; because, by the first error, no great loss can be sustained; whereas, by the other, a feeble and late crop may be the consequence." Deane says, "The shooting parts exist, in a potato, in the form of a tree, of which the stock is at the but or root-end. I therefore take care to cut athwart those parts as little as possible: though they will grow any way, the greater length of shooting stem

there is in a set, the more strong and vigorous will be its growth at first."

Quantity of sets.—Abercrombie directs, for a plot of the *early* and *secondary crops*, eight feet wide by sixteen in length, planted in rows, fifteen inches asunder by nine inches in the row, a quarter of a peck of roots or cuttings. For *full-timed* and *main crops*, a compartment, twelve feet wide by thirty-two in length, planted in rows, two feet distant, half a peck. For *field cultivation*, English writers say that it requires twenty bushels and a half to plant an acre with cut potatoes; and thirty-seven bushels and a quarter of whole potatoes.

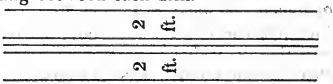
Soil.—"The soil," says Loudon, "in which the potato thrives best, is a light loam, neither too dry nor too moist, but if rich, so much the better.—They may, however, be grown well on many other sorts of land, especially those of the mossy, moory, and other similar kinds, where they are free from stagnant moisture. The best flavoured potatoes are almost always produced from a newly broken-up pasture-ground, not manured; or from any new soil, as the site of a grubbed-up copse or hedge, or the site of old buildings or roads. The best climate for the potato is one rather moist than dry, and temperate or cool rather than hot. Hence the excellence of the Irish potatoes, which grow in a dry, loamy, calcareous soil, and moist and temperate climate; and hence, also, the inferiority of the potatoes of France, Spain, Italy, and even Germany. In short, the potato is grown no where in the world to the same degree of perfection as in Ireland and Lancashire, and not even in the south of England, so well as in Scotland and the north and western counties; all which is, in our opinion, clearly attributable to the climate."

Although a *light* loam is a proper soil for the potato in a cool and moist climate, a strong and *heavy* loam is most suitable for the same root in a dry and hot climate. In a paper read before the New York Horticultural Society, in 1823, by Wm. Wilson, an experienced horticulturist, are the following remarks on this subject:—"Those soils which prove the very bane of the potato here [in the United States] are just such as prove the most congenial for them in Britain. And so, on the contrary, the best soils, by far, for producing the driest and best flavoured potatoes here, and altogether the most abundant crops, are those of a strong, heavy loam." These assertions are corroborated by a number of experi-

ments, mentioned in the paper from which they are extracted. Mr. Buel, of Albany, likewise asserts, that "the best potatoes are grown upon cold, moist, but porous and rich soils."—*Am. Farmer*, vol. ix. p. 409.

Methods of planting.—These are various. If the land is rough, hard, or stony, the common mode of planting in hills is, perhaps, the most expedient. But, if it be somewhat mellow, drills are to be preferred. Dr. Cooper says, "If your soil is stiff and wet, plough it in ridges; if sandy and dry, plough it flat. Plough it deep. Plant your sets in drills marked out by the plough or the hoe. The plants should be dibbled in, six inches deep, on long dung, scattered not sparingly along the drills, then covered with about four inches of mould.

The drills should be in threes ≡ one foot apart; the plants should be eight inches apart, with an interval, on each side of each set of three drills, of two feet, which will admit of horse-hoeing between the sets of drills, and of hand-weeding between each drill.



To have a good crop, you must not spare dung, or spare labour in weeding. Some persons prefer sets of four or five drills, instead of three; or, where horse-hoeing is not convenient, the intervals may be reduced to one foot between each set of drills, for the convenience of hand-weeding; but, upon the whole, the method here first proposed is as good as any. Forty loads of dung per acre will pay better than a less quantity.

"If small potatoes are wanted for feeding, the sets may be at six inches apart, and the rows at nine inches; but the method first here proposed admits, what is essential, accurate weeding, and sufficient air to circulate between the plants."

Deane says, the sets may be either in single rows, three feet, or double, one foot apart, and from seven to nine inches asunder in the rows.

"An expeditious way of planting potatoes is as follows After the ground is prepared, by ploughing and harrowing, cut furrows, with the horse-plough, forty inches apart; drop the sets in the furrows; then pass the plough along the back of each furrow, which will throw the earth of both furrows upon the sets; and afterwards level the ground

with the back of the harrow, or with a harrow that has short tines; but it is of no great consequence whether it be levelled at all. Another method of planting is, to plough the ground plain, keeping the furrows straight and regular, and drop sets in every third or fourth furrow. But, before this is done, the ground should be ploughed and made level and fine with the harrow."

A writer for the *N. E. Farmer*, vol. ii. p. 331, gives the following as "an easy and cheap method of raising potatoes: On an even and smooth piece of mowing, or pasture land, make deep, single furrows, with a plough, at three feet distance. Fill these furrows with rye [or any other] straw, and drop your potatoes six or eight inches apart, on the straw. Then, with a hoe, cover the potatoes by turning down the ploughed furrows upon them. They will require no more attention till they are grown. No hoeing will be necessary. The same land may be improved as a pasture for sheep, as those animals will not eat, nor materially injure, the tops of the potatoes."

The *after-culture* of potatoes consists in harrowing, hoeing, weeding, and earthing up. All potatoes require to be earthed up; that is, to have at least one inch in depth of earth heaped on their roots, and extending six or eight inches round their stem. The reason is, that the tubers do not, properly speaking, grow under the soil, but rather *on*, or just partially *bedded* in its surface. Potatoes should, generally, be hoed three times, though twice will do in ground not infested with weeds. The last hoeing should be finished before the plants are in blossom; otherwise the plants will be apt to form a second set of roots, which will not have time to come to maturity, but will rob those first formed of their nourishment. If weeds are prevalent, they should be cut up or pulled out, but the plants should not be earthed up in that stage of their growth. Plaster of Paris, well pulverized, and applied to the leaves, has a beneficial effect on potatoes.

Pinching off the blossoms.—It is now generally admitted, that a certain advantage, in point of produce, is obtained by pinching off the blossoms as they appear on the plants. The fact has been repeatedly proved, and satisfactorily accounted for, by Knight, who imagines that it will add an ounce in weight to the tubers of each plant, or considerably above a ton per acre.

Gathering the crop.—It is believed that cultivators are apt to err by gathering their potatoes too early. The roots

continue to grow larger and better after the tops have attained their full growth. The Hon. O. Fiske, of Worcester, in an address to the Worcester Agricultural Society, says, "Nature has not accomplished its maturation at the period when the vines decay, and the farmer believes it to be ripe. It seems probable that the earth, by some unknown process, perfects its qualities after it has attained its growth. That potatoes, which have remained the whole season in the earth are more farinaceous, has been ascertained." It may be stated, as a general rule, that potatoes succeed best when planted early and dug late. But it is most advisable to harvest them before the occurrence of those soaking rains, which generally precede the setting in of winter.

A mode of taking part of a crop is mentioned:—"Having ascertained that some of the tubers have attained an eatable size, go along the rows, and loosen the earth about each plant with a blunt stick, taking two or three of the largest tubers from each, and returning the earth carefully."

The most expeditious way of gathering a potato crop is, first to run furrows on each side of the rows, and then a deep one in the middle, which turns up most of the roots to the surface, for the purpose of picking up by hand. In this way, however, we should apprehend some waste, and should not advise it, except where potatoes are plenty, and labour scarce. A hoe with prongs, such as is sold at J. R. Newell's Agricultural Establishment, No. 52 North Market street, Boston, is, probably, the best implement for gathering potatoes.

Securing the crop.—Mr. Buel, of Albany, says, "There are many erroneous notions, in regard to the culture and treatment of the potato, which every class in society have an interest in exploding, as the root has become a necessary food for every family." These errors consist in supposing "1st. That potatoes should be grown on a dry, warm soil. 2d. That they should be dried in the sun, or washed, to render them pleasant to the eye. 3d. That they should be kept warm and dry during winter, to fit them for culinary uses. 4th. That they should be of large size." In contradiction to these popular opinions, he asserts, "*First*, that the best potatoes are grown upon cold, moist, but porous and rich soils. *Second*, that it were better the sun never should shine upon them—that they should be housed with all the dirt that adheres to them—that it is beneficial to add more dirt in the bin or cask, to exclude external air as

much as possible. And, *third*, that their surface should be kept moist, and the atmosphere, which surrounds, as little above the point of freezing as possible."

Potatoes may be kept during winter in a cellar, free from frost, or in pits or eaves in the field. In the latter case, they must be so situated on a dry knoll, or the side of a hill, as to be secured from the possibility of the pits being pervaded by water; and they must be so covered, first with straw and then with loam, as to prevent the intrusion of frost. They may, likewise, be placed in barrels, casks, or boxes, and if packed in moist sand, or the loam of the field in which they grew, they will be preserved better than in almost any other situation. If they are exposed to the sun and air till the upper side acquires a green colour, they become poisonous.

Use.—The use of the potato, as an article of diet both for man and beast, is, probably, more extensive, and more common, than that of any other vegetable production. From having no peculiarity of taste, and consisting chiefly of starch, it approaches near to the qualities of the flour of grain; "and for this reason," says Loudon, "it is the most universally liked, and can be used longer in constant succession by the same individual without becoming unpalatable, than any other vegetable, the seeds of grasses excepted." Neill observes, "so generally is it relished, and so nutritious is it accounted, that, on many tables, it now appears almost every day in the year."

An Essay on the *Solanum Tuberosum*, by H. C. Worsham, from the *Philadelphia Journal of the Medical and Physical Sciences*, gives the following summary view of the excellent qualities of this superlative root:—"Having its origin in a warm climate, it was supposed to be intolerant of cold, and upon that account incapable of cultivation in a more northern clime. But experience has shown the contrary, and the potato is naturalized almost in every region. With the lower classes of people, it is one of the greatest blessings which the soil produces, forming 'flour without a mill, and bread without an oven;' and, at all seasons of the year, an agreeable, wholesome dish, without expensive condiments. What resources does the potato present to us? Its stalk, considered as a textile plant, furnishes in Austria a sort of flax—when burned, it yields much potash—its apples, when ripe and crushed, ferment, and give spirits by distillation—its tubercles, made into a pulp, are a substitute for soap, in bleaching. Cooked by steam, the potato is a

most healthy food. By different manipulations it furnishes two kinds of flour, a gruel and a parenchyma, which may be applied to increase the bulk of bread made from grain. Treated chymically, it is converted into beer, vinegar, spirits, &c."

PRUNING.—"In pruning the apple-tree and all other standard trees, the points of the external branches should be every where rendered thin and pervious to the light; so that the internal parts of the tree may not be wholly shaded by the external parts. The light should penetrate deeply into the tree, on every side; but not any where through it. When the pruner has judiciously executed his work, every part of the tree, internal as well as external, will be productive of fruit; and the internal part, in unfavourable seasons, will rather receive protection than injury from the external. A tree, thus pruned, will not only produce much more fruit, but will also be able to support a heavier load of it, without danger of being broken; for any given weight will depress the branch, not simply in proportion to its quantity, and its horizontal distance from the point of suspension, by a mode of action similar to that of the weight of the beam of the steel-yard; and hence a hundred and fifty pounds, suspended at one foot distance from the trunk, will distress the branch, which supports it, no more than ten pounds at fifteen feet distance would do Every tree will, therefore, support a larger weight of fruit, without danger of being broken, in proportion as the parts of such weight are made to approach nearer to its centre.

"Each variety of the apple-tree has its own peculiar form of growth; and this it will ultimately assume, in a considerable degree, in defiance of the art of the pruner. Something may nevertheless be done to correct whatever is defective. When the growth of any variety is weak and reclining, the principal stem should be trained to a considerable height, before it be allowed to produce branches; and if any of these take a horizontal or pendent direction, they should be regularly taken off. One principal leading stem should be encouraged almost to the summit of the tree, to prevent a sudden division into two large boughs of nearly equal strength; for the fork which these form is apt to divide and break, when the branches are loaded with fruit. All efforts to give young trees a round and regularly spreading form, whilst in the nursery, will be found injurious in the future stages of their growth. Large branches

should rarely or never be amputated."—*Knight's Treatise on the Culture of the Apple and Pear.*

"Hitt recommends that the shape or figure of standards should be conical, like the natural growth of the fir-tree; and this form, or the pyramidal or sub-cylindrical, is decidedly preferred by the French, and universally employed by the Dutch.

"*The season for pruning.*—For all the operations of pruning, which are performed on the branches or shoots of trees, it would appear the period immediately before, or commensurate with, the rising of the sap, is the best."—*Loudon.*

"My practice has been to prune in the spring, beginning when the buds have scarcely begun to swell, and ending before the expansion of the leaves. But I never leave 'stumps' of limbs. Every branch, that is taken away, is cut close and even with the stem or limb where it grew; and the healing of the wound commences and proceeds kindly as vegetation advances. If the branch cut off be large, the wound should be covered with some kind of plaster."—*Col. Pickering.*

If, however, pruning is commenced at a proper stage of the growth of the tree, and properly and seasonably attended to, it will rarely be necessary to take off a large limb, and small ones, if cut close and smooth, may be taken off any season. See remarks on pruning trees by a writer for the *N. E. Farmer*, vol. iii. p. 273.

PUMPKIN.—*Cucurbita pepo.*—The pumpkin is a native of India. Loudon says there are six species in cultivation, but gives no description of them. Russell's Catalogue enumerates the following varieties:

Finest yellow family pumpkin,	Mammoth, (*which have grown to 226 lbs. weight.*)
Connecticut field,	Seven years, (*a fine sort to keep.*)
Large cheese,	

Pumpkins will grow on any kind of soil, which is proper for head-crops, but the land cannot be made too rich for them. The *Farmer's Assistant* thinks they will grow better, when planted by themselves, than when raised, as usual, with Indian corn. "The hills, in such case, should stand about seven feet apart each way, and a number of seeds should be planted in each hill, to make allowance for what may be destroyed by insects. It will be well, however, to protect them by frames, covered by gauze, as directed p. 91, under the article CUCUMBER.

Preservation.—Pumpkins may be kept in a cellar, for this purpose, a considerable part of the winter; but the cellar must not be too warm; and care must be taken not to break off the stems, but leave these attached to them; otherwise they will soon commence rotting, at the places where the stems were broken off.—*Farmer's Assistant.* They may likewise be preserved in mows of hay or straw, or in any dry situation, in which they are secure from frost.

Use.—Loudon says of the pumpkin, "Though commonly cultivated in gardens for curiosity, yet, in some of the country villages in England, the inhabitants grow it on dunghills, at the backs of their houses, and train the shoots to a great length over grass. When the fruit is ripe, they cut a hole in one side, and, having taken out the seeds, fill the void space with sliced apples, adding a little sugar and spice, and then, having baked the whole, eat it with butter.—*Neill.* Pumpkin-pie, Abercrombie says, is very common [in Great Britain, and proverbially so in New England.] On the continent the fruit is a good deal used in soups, and also stewed and fried in oil and butter." Its culinary uses in the United States are too well known to need description; but some may not be aware that "Pumpkins are excellent for fatting horses. They, however, do not relish them at first; and therefore must be kept from feeding till they are hungry, before the pumpkins are offered to them, and let a little salt be first sprinkled on this food; when they will soon grow fond of it, and eat it readily without salt."

QUINCE.—*Pyrus cydonia.*—The quince is a native of the southern and eastern parts of Europe.

"*Varieties.*—Miller enumerates—

The oblong, or pear-quince, with oblong ovate leaves, and an oblong fruit, lengthened at the base.

The apple-quince, with ovate leaves, and a rounder fruit.

The Portugal quince, with ovate leaves, and an oblong fruit, which is more juicy, and less harsh than the others, and therefore the most valuable. It is rather a shy bearer, but is highly esteemed for marmalade, as the pulp has the property of assuming a fine purple tint in the course of being prepared.

The mild and eatable quince, less austere and astringent than the others.

"*Propagation.*—Generally by layers, but also by cuttings; and approved sorts may be perpetuated by grafting. In propagating for stocks, nothing more is necessary than to remove the lower shoots from the larger, so as to preserve a clean stem as high as the graft; but for fruit-bearing trees, it is necessary to train the tree to a rod, till it has attained four or five feet in height, and can support itself

upright. It is seldom planted but as a standard in the orchard, and a very few trees are sufficient for a family.

"The time of planting, the mode of bearing, and all the other particulars of culture, are the same as for the apple and pear."—*Loudon.*

"The stem of the quince is employed for the reception of apple and pear grafts, and has the property of giving to the fruit it bears greater precocity, an increased size, and improved flavour; but with this drawback, that 'the quantity is small, and the product short-lived, as the age of the tree seldom exceeds ten or twelve years.' The quince-tree is liable to be attacked by the worm called the borer, the same as the apple-tree and the pear-tree, and the same remedies are recommended.

Use.—"The fruit is not eaten raw; but, stewed, or in pies or tarts, along with apples, is much esteemed. In confectionary it forms an excellent marmalade and syrup. When apples are flat, and have lost their flavour, Forsyth observes, a quince or two, in a pie or pudding, will add a quickness to them. In medicine, the expressed juice, repeatedly taken in small quantities, is said to be cooling, astringent and stomachic. A mucilage prepared from the seeds was formerly much in use, but is now supplanted by the simple gums."—*Loudon.* "This fruit is generally boiled and eaten with sugar, in which form it may be usefully employed in cases of dysentery. Five gallons of the juice of quinces, mixed with twenty-five pounds of sugar, and fermented, affords a delicious wine. By boiling the kernels of quinces in water, a mucilage is extracted, which is often used in medicine as a substitute for that of gum Arabic. Quinces are excellent in apple-pies, in the proportion of one fourth quince to three fourths apple, with some thin slices of candied lemon-peel or citron."—*Dom. Encyc.*

RADISH.—*Raphanus sativus.*—The garden-radish is a native of China, and introduced into England in 1584.

Varieties.—Mr. Russell's Catalogue contains the following :—

Early short-top scarlet, (*a superior sort,*)	Long salmon,
Early frame,	Cherry, or scarlet turnip-rooted,
Long white summer, or Naples,	White turnip-rooted,
Purple-short top,	Violet-coloured turnip-rooted,
	Black fall, or Spanish.

Propagation.—All the varieties are raised from seed.

Soil and situation.—The soil should be light and mellow well broken by digging. A scattering of the smaller grow-

ing sorts may be sown among some broad-cast crops of larger growth, such as spinage, lettuce and onion; it may also be drilled between wide rows of beans, or on ground intended to be sown with a late spring crop.

Times of sowing.—"To have a constant succession of radishes at table, the seeds should be sown once a fortnight, from April [or the last of March] to August. But in midsummer they sooner grow sticky and strong, than in spring or fall. They must therefore be eaten while they are young. I have had better success with those sown in August than in any other month."—*Deane.*

Seed, process in sowing, and common culture.—"Sow each sort separately; and for a bed four feet six inches by twelve feet, two ounces of seed will be required of the spring sorts, and an ounce and a half for the autumn varieties. All the kinds may be sown either broad-cast or in drills; but the latter is preferable, as allowing the roots to be drawn regularly, with less waste. If you sow broad-cast, it is a good method to make beds four or five feet wide, with alleys between, a foot wide, the earth of which may be used to raise the beds, or not, as the season may make it desirable to keep the beds dry or moist. Avoid sowing excessively thick, as it tends to make the tops run, and the roots stringy. Rake in the seed well, full half an inch deep, leaving none on the surface to attract birds. If you trace drills, let them be, for the spindle-rooted kinds, half an inch deep, and about two inches and a half asunder; for the small turnip-rooted, three quarters of an inch deep, and four or five inches asunder; and for the black turnip or Spanish, six or eight inches asunder, because the root grows to the size of a middle-sized turnip. As the plants advance in growth, thin them so as to leave the spindle-rooted about two inches square distance, and the other sorts three, four, or five, leaving the most space to the respective sorts in free, growing weather. In dry, warm weather, water pretty frequently: this swells the roots, and makes them mild and crisp."—*Abercrombie.*

"This root being liable to be eaten by worms, the following method is recommended for raising them:—Take equal quantities of buck-wheat bran, and fresh horse-dung, and mix them well and plentifully in the ground by digging. Suddenly after this a great fermentation will be produced, and numbers of toad-stools will start up in forty-eight hours. Dig the ground over again, and sow the seed, and the radishes will grow with great rapidity, and be free

from the attacks of insects. Buck-wheat bran is an excellent manure of itself."—*Farmer's Assistant.*

Use.—"Formerly the leaves were often boiled and eaten; but now the roots are chiefly employed. These are eaten raw in spring, summer, autumn, and winter. The young seedling leaves are often used with cresses and mustard, as small salad; and radish-seed pods, when of plump growth, but still young and green, are used to increase the variety of vegetable pickles, and are considered a tolerable substitute for capers."—*Loudon.*

"Radishes are esteemed aperient, attenuating and antiscorbutic: when eaten in moderate quantities, they are in a certain measure salubrious to persons of strong habits; but are, in general, apt to produce a considerable degree of flatulency in those whose stomachs are relaxed. No radishes, however, ought to be eaten when *old*, or after having been kept some time, as they are then utterly indigestible, and render the breath very offensive.—*Dom. Encyc.*

Dr. Cooper observes that "Radishes ought to be sown in rich ground, and carefully tended, so as to grow quickly: if not, they are become stringy, in which state they are very unwholesome and indigestible."

Seed.—"Radishes that are for seed require much room, as they grow to a large size. For this purpose some of the most thrifty ones should be left standing; or else be transplanted to a place where each shall have as much room as nearly a yard square. The ripeness of the seed is known by the pods turning brown. For this purpose the seeds must be sown early in the spring, because they ripen slowly."—*Deane.*

For forcing radishes, hot-beds, and culture proper for hot-bed productions, should be resorted to. See *Encyc. of Gard.* p. 596.

RHUBARB.—*Rheum.*—There are three species of this plant in cultivation—the *R. rhaponticum*, a native of Asia; *R. hybridum*, also a native of Asia, and *R. palmatum*, a native of Tartary, distinguished by its elegant palmate leaves, and considered as the true Turkey or Russia rhubarb.

Propagation and culture.—"All the sorts may be raised either from seed or by dividing the roots. If from seed, which is the best mode, sow in light, deep earth, in spring; and the plants, if kept eight or nine inches asunder, will be fit for transplanting in autumn, and for the next spring. When the roots are divided, care must be taken to retain a bud on the crown of each section: they may be planted

where they are finally to remain. When a plantation is to be made, the ground, which should be light and rather sandy, but well manured, should be trenched three spits, or as deep as the sub-soil will admit, adding a manuring of well rotted hot-bed dung. Then plant in rows, three feet wide by two feet, in the rows for the *R. rhaponticum* and *palmatum*, and five feet by three feet in the rows for the *R. hybridum*. No other culture is required than keeping the ground free of weeds, occasionally stirring it, during summer, with a three-pronged fork, and adding a dressing of well rotted manure every autumn or spring, stirring the ground as deep as possible. Some never allow the flower-stalks to produce flowers; and others cut them over as soon as they have done flowering, to prevent the plants from being exhausted by the production of seeds. The former seems the preferable method, as the flower-stalks of plants cannot, like the leaves, be considered as preparing a reserve of nourishment for the roots.

Blanching.—"The advantages of blanching the stalks of rhubarb, for culinary purposes, have been pointed out by T. Hare, Esq.—*Hort. Trans.* vol. ii. 'These are two-fold, namely, the desirable qualities of improved appearance and flavour, and a saving in the quantity of sugar necessary to render it agreeable to the palate, since the leaf-stalks, when blanched, are infinitely less harsh than those grown under the full influence of light, in an open situation.' It may either be blanched by earthing up the roots early in spring, or earthen pots may be used, as in blanching sea-kale.

Taking the stalks.—"Remove a little earth, and, bending down the leaf you would remove, slip it off from the crown without breaking, or using the knife. The stalks are fit to use, when the leaf is half expanded; but a larger produce is obtained by letting them remain till in full expansion, as is practised by the market-gardeners. The stalks are tied in bundles of a dozen and upwards, and thus exposed for sale.

To save seed.—"Leave one or two of the strongest flower-stalks to perfect their seeds, which they will do in July and August.

Use.—"The two first species are cultivated entirely, and the third, in gardens, principally, for the petioles of the root-leaves, which are peeled, cut down, and formed into tarts and pies in the manner of apples and gooseberries. The *R. hybridum* affords the most abundant and succulent supply for this purpose."—*Loudon.*

ROLLER.—This is a heavy cylindrical instrument, to pass over lands, render them more compact, and answer other useful purposes in field husbandry and gardening. Many of the complaints we hear, of seeds not growing, arise from their not being rolled. Many seeds will not vegetate at all, and many others will vegetate slowly, feebly, and unequally, if the ground be not rolled soon after the seed is sown. "Those rollers which are cut out of free-stone, being heavier than wooden ones, are best to smooth and harden the alleys in gardens. But wooden ones answer better in tillage, when they are sufficiently large. A roller for field-husbandry should be five or six feet long; so that it may perform much in a short time, being drawn by a horse or yoke of oxen, for either of which it may be easily harnessed. It should be made perfectly round and smooth, that it may be drawn the more easily, and press the ground more equally in all parts. And it should be from eighteen to twenty-four inches diameter. Being large, the pressure will be greater, and the surface will be the more level."—*Deane.*

Where there is no roller on the premises, the following is recommended as a substitute:—After the seed is sown, and the ground well raked, take a board or boards, of the whole length of the bed; lay them flat on the ground; beginning at one edge of the bed, walk the whole length of the board; this will press the soil on the seed; then shift the board, till you have thus gone over the whole bed; and in dry weather, cover your beds, for forty-eight hours, with boards laid flat on the soil, and the seeds will come up almost immediately. If no boards are at hand, tread in the seed with your feet, or strike on the bed with the blade of your spade or shovel.

ROSE.—*See* FLOWERS, p. 125.

ROSEMARY.—*Rosmarinus officinalis.*—"The rosemary is a hardy under-shrub, a native of the south of Europe. It is an evergreen, rising sometimes six or eight feet high, though rarely. The leaves are sessile, linear, dark-green above, and grayish or whitish underneath; the blossoms are of a pale blue colour. The whole plant is highly aromatic.

"*Varieties.*—These are,

The green, or common, | The gold-striped, | The silver-striped.

Culture.—The green is hardiest as a plant, and is the sort generally used. The finest plants are raised from seed, sown either broad-cast or in drills, six inches apart. This plant is also propagated by cuttings and suckers. "Planted

in the month of March, six inches apart, and inserted two thirds of their length in the ground, they will take root freely, and, by the month of September, be fit for transplanting wherever destined to remain."—*M'Mahon.*

RUE.—*Ruta graveolens.*—This is an under-shrub, an evergreen, which prefers a light soil, and is easily propagated by cuttings or seeds. Mr. Armstrong says, "its beauty is much increased by lopping the branches close to the earth every fourth year."

Use.—Boerhaave recommends the leaves of rue as of great service to persons of cold, phlegmatic habits; as they quicken the circulation, dissolve viscid or tenacious juices, remove obstructions, and promote the fluid secretions. Mr. Wilson, in his *Economy of the Kitchen Garden*, says, "The most effectual remedy for expelling worms, that has ever come under my observation, was effected by an infusion of the tops of rue, given in gin to the patient, in the morning, fasting."

SAGE.—*Salvia officinalis.*—Sage is a native of the south of Europe. Its varieties are,

The red,	The small-leaved green, or sage
The broad-leaved, or balsamic,	of virtue.
The green,	

Estimate of sorts.—"The red is the principal sort in culinary use, having the most agreeable and the fullest flavour; the green is next in estimation with the cook; but the small-leaved is generally preferred to those to eat as a raw herb, and for decoctions; while the broad-leaved, balsamic species is the most efficacious in a medical way, and is also a tea-herb. However, any of the sorts may be occasionally used for these alternate purposes.

Culture.—"They are all propagated alike, by seeds or suckers, and by portions of old roots, and grow well in any soil not positively wet. Till three or four years old, they have a healthy and agreeable appearance, forming full and regular tufts; but, after this period, they lose the central branches, and even become ragged and broken at the edges. The treatment already suggested for rue might be useful for sage. Under it, the roots would probably renew their vigour, and throw out new and healthy shoots; but of this theory we have no experience."—*Armstrong.*

Use.—"The leaves are used in stuffings and sauces, for many kinds of luscious and strong meats, as well as to improve the flavour of various articles of cookery. The de-

coction called sage-tea is usually made from one variety, the small-leaved green, or sage of virtue; but any of the others are equally fit for this purpose."—*Loudon.*

SALSIFY, *or* OYSTER PLANT.—*Tragopogon porrifolius.*—The salsify is a hardy biennial, a native of England. The root is long and tapering, of a fleshy white substance; the herb smooth, glaucous, and rising three or four feet high. The leaves resemble those of the leek; the flowers are of a dull purple colour, closing soon after midday; the seed, as in other species of goat's beard, is remarkable for having attached to it a broad feathery crown.

Culture.—"It resembles a small parsnep in its appearance. It is raised annually from seeds, and as easily, requiring no more care than the carrot. It bears a tolerable crop.

Use.—"In this country it is parboiled, and then fried either in batter or without. It forms an admirable garnish for boiled fowls or turkies. In its taste it so strongly resembles the oyster, that, when sliced and fried in batter, it can scarcely be distinguished from it. If our gardeners would introduce it into the market, and our citizens once try it, there would be no danger of its ever failing hereafter to be raised. It is in eating from November to May, precisely the period in which our vegetable market is most deficient in variety."—*John Lowell, Esq. in Mass. Agr. Repos.*

"The stalks of the tragopogon may be cut in the spring, when they are four or five inches high, and dressed like asparagus, in which they eat very tender and well."—*Rees' Cyclopedia.*

SAVORY.—*Satureja.*—Two species of this plant are cultivated—the *winter* and *summer* savory.

Winter savory is a hardy under-shrub, a native of the south of France and Italy. The shoots are furnished with two narrow, stiff leaves, an inch long, placed opposite at each joint, and from the base of these a few small leaves proceed in clusters. It produces whitish flowers in May and June.

Summer savory is a hardy annual, a native of Italy. The branches are slender, erect, and about a foot high; leaves opposite, and almost an inch in length. It flowers in June and July.

Culture.—Winter savory is a perennial plant, and is propagated from seeds or slips; summer savory, from seeds only. Both sorts will grow on almost any soil, and it is said that the winter kind grows best on barren soils.

Use.—"Both the summer and winter savory have long been cultivated for culinary and medicinal purposes. Their warm, aromatic, pungent leaves are much esteemed in salads: formerly, they were employed medicinally, with a view to attenuate viscid humours, to dispel flatulency, and to increase the appetite. According to Professor Bradley, this herb, when dry, and put into a bed, possesses the remarkable property of expelling fleas."—*Dom. Encyc.*

SEA-KALE.—*Crambe maritima.*—The sea-kale grows spontaneously on many parts of the sea-coast of Great Britain. The inhabitants watch when the shoots begin to push up the sand and gravel, in March and April, when they cut off the young shoots and leaf-stocks, then blanched and tender, and boil them as greens.

Use.—"The young spring shoots, and the stalks of the unfolding leaves, blanched by rising through the natural ground in a wild state, or by earthing up in gardens, are the parts used; and, when boiled, and dressed like asparagus, are not inferior to that vegetable. They form also an excellent ingredient in soups. Sometimes the ribs of the large leaves are peeled and dressed as asparagus, after the plant has ceased to send up young growths. By forcing, sea-kale may be had in perfection from November till May, a period including all the dead months of the year. It is remarked by Nicol, that vegetables are seldom improved by forcing, but that sea-kale forms an exception, the forced shoots produced at mid-winter being more crisp and delicate in flavour than those procured in the natural way, in April or May. Sir George Mackenzie (*Caled. Hort. Mem.* vol. i 313) observes, that sea-kale cannot easily be overdone in cooking, and that, after being well-boiled, it should be thoroughly drained, and then suffered to remain a few minutes before the fire, that a further portion of moisture may be exhaled."—*Loudon.*

John Lowell, Esq., in a communication, published in the *Mass. Agr. Journal*, says, "It is very hardy—grows in any tolerable soil—is perennial, and costs not half the labour bestowed on asparagus. It may be raised from the seed or from the root, and fifty plants, occupying a very small space, will supply a single family. In its taste it resembles the cauliflower. The only labour it requires, is, to cover it with sand or earth, or with pots or boxes in March, so as to exclude the light, and to blanch it, or make it white. If not blanched, it is neither so beautiful to the eye, nor so tender, nor so delicate to the taste, as if blanched. It should be

thoroughly boiled, and is better if boiled in milk and water. It should be served up like cauliflowers, with melted butter. It comes in at a season in which our vegetables in this country are very deficient."

Mr. Armstrong says, "In November, whether your bed has been filled with plants or with seedlings, be careful to cover them with a thick coat of well-rotted dung, and so soon in the spring or summer as you find them pushing through this covering, put over each a garden-pot inverted, having first stopped the bottom holes. The signal for cutting is when the plants have arisen about three inches above the surface."

SILK.—The following article, on a subject, whose importance is beginning to be duly appreciated in the United States, was written expressly for this work, at the request of the compiler, by a gentleman, who has a practical, as well as scientific knowledge of the processes pursued in Europe in the manufacture of silk:—

The cultivation of the soil is a duty, which was imposed on man almost coeval with the creation. It bears with it the sanctity of a primeval ordinance, and is irresistibly endearing, inasmuch as it admirably suits our nature, so as to promote, in a singular degree, health and comfort, vigour and clearness of mind; the blessing on a ready compliance with this divine law is evident from the happiness which flows therefrom, and which would make of the cultivators of the land, under some better advantages of education, the greatly favoured order of society. It is at the table of their own providing, that the nation is entertained—it is to the vigour, and to the faithfulness of their arm, that it trusts for its security.

All hail, Agriculture and its noble bands! On the fragrant earth their appointed labour is performed; their dome is the pure vault of heaven, and their employ is that by Mercy assigned for the renovation of our race. There, since the days of old, has been the firm foundation of national greatness and prosperity; and there it must remain until the end of time. It is to those purposes, that comprehensive and active minds would find delight in directing their powers, because of the vastness of the field to explore, and of the greatness of the results to be expected.

Much has been said of the roughness of the New England soil and climate, and much more than ever was true. Since the time of the Pilgrims, however, what harshness there was has been softened, and the climate, in our days,

is hastening to take its rank among the most favoured for temperature and healthfulness. When the eye roams among our hills and vales, where can we meet with a more delightful variety? or a choice of aspects, and situations, so valuable for agricultural purposes? Some of our land is hard to work, because it wants a more thorough cultivation; and some abounds with rocks, that we may find there the best materials for our dwellings. What is there wanting, then, to make of New England a vast garden? Nothing, but contented labour, and intelligence to direct it—and that we have. Let all awake, then, and try to improve, to the best advantage, the natural abilities of the country—and we shall find, that, far from any cause of discouragement, we are greatly favoured.

To the cultivation of grain and potatoes, we have discovered (in late years) that the soil and climate are well adapted to the raising of wool, even of Merino; and in a wonderfully short time, all over the land, there are great sheep-folds. There are also manufactures that employ all that wool, and much more, and provide us with comfortable and handsome clothing.

There are other mines yet unexplored. To the industrious and active, the prize must belong; and to them, we wish to point out the article of SILK, as one most deserving their attention. What is there, that the soil can yield, so rich as silk, and that can be obtained with so easy a labour? Excepting the first raising and planting of the mulberry-trees, all the work can be performed by women, children, and aged people. We are fully and sufficiently satisfied, that this noble article may be made a staple of our country; and the advantages that would result from it, in a private and national point of view, are so important, that we cannot deny ourselves the satisfaction of devoting a few pages of this volume to that interesting subject—hoping that they may prove acceptable and, eventually, useful to many of our readers.

The raising of silk is not altogether novel in our land: many individuals in Massachusetts and Connecticut have attended to it for a number of years, with much advantage; and it is a fact fully established, that the soil and climate are congenial to the flourishing growth of the mulberry; and that the silk-worms will thrive in New England, under proper management, as well as they do in most parts of Europe, where the raising of silk is the vital sinew of the community. Without any further remarks,

we shall enter, therefore, upon the subject, and set down, first, such practical information as relates to the raising of mulberry-trees.

The mulberry and the silk-worm are natives of Asia. They were both unknown in Europe until the year 555—when the emperor Justinian sent two monks to Serinda, in India, from whence they brought to Constantinople the seed of those precious insects, and the necessary information for their management. Thus they laid the foundation of those superb silk manufactures, which, for near seven hundred years, flourished in Greece, at Athens, at Thebes, and Corinth. Before that time, the great of the earth, alone, could afford to clothe themselves with silk; the price of which was weight for weight in gold. About six hundred years after, the culture of silk was introduced from Greece into Italy; and from thence into France, in the year 1494. Since those days, it has spread over all the southern and midland parts of Europe, and is now cultivated with success as far north as Prussia, where the mulberry-tree resists the most rigorous winters without injury.

There are two different species of mulberry,—the *black*, which is cultivated for its excellent fruit, of a dark crimson colour, almost black; and is a tree of slower growth than the white; the leaves are larger, of a darker green, thicker and stronger. The silk-worms will eat them for the want of better, but they do not thrive upon them, and the silk is coarse and inferior. The *white* mulberry-tree bears a white, or light pink fruit; and its leaves are the most congenial food for these precious insects; is of a quicker growth, and does not come to so large a size as the black. The white mulberry is a very hardy tree, and bears our severest winters without any apparent injury; will last a great many years, and, if cut down close to the ground, will send up many suckers all around, and resist destruction for several years. There are many kinds of white mulberry, the leaves of which differ in point of merit as a food for the silk-worm. Some are of a small size, earlier, and more tender; and, on that account, are cultivated as the most proper for the worms when first born; others are large, and of a peculiar quality, which suits the taste of the worms, upon which they thrive best, and make the handsomest silk. In France and Italy, they universally graft the wild stocks with those sorts which experience has taught them to be the most valuable.

At this early stage of the business with us, it would be

difficult to attain, at once, the nicety which a long practice has introduced in the old countries. What we have to do for the present, is, to sow mulberry-seed, raise the young plants as in a nursery, reject those whereon thorns appear, as being the wildest, and bearing the smallest leaves; also those that have thick, coarse, hairy leaves. Save those that have the largest and handsomest smooth leaves; the worms eat them more readily, and experience has shown that they thrive best upon them, make more silk, and of a better quality. The best plants for earliness and superiority of leaves, should be set out and noted; as they may hereafter furnish scions for grafting. Upon a dry soil, the mulberry-trees do not grow much taller than our largest peach-trees; but they are stouter and thicker set. Their roots, which are of a remarkably bright gold colour, (that of silk,) extend to a considerable distance; and they ought not to be planted, on that account, nearer than thirty feet from tree to tree.

As the gathering of leaves too soon would injure the growth and constitution of the trees, we would recommend that no leaves should be gathered from them until after the fifth year. In the mean time plantations may be made for immediate use, by sowing the seed in drills, at a convenient distance; planting beans or potatoes between, to keep the ground clear of weeds. The second year after sowing, these seedlings might be cut down with a sharp instrument, three or four inches from the ground, and would give a second crop the same season. In the silk countries, they raise seedlings in rows for the first feeding of the worms: these young plants, putting out their leaves earlier than the old trees, and being more tender, are better adapted for the worms in the first stage of their existence. They also plant the mulberry-trees, and suffer them to grow according to unrestrained nature, branching out from the ground. This is for the convenience of gathering the leaves more easily, and making a food stronger than the seedlings. They consider the leaves from trees regularly trained, with a single butt, and of several years' growth, to give the most substantial food; upon which the worms should be kept during the last period of their life, previous to their ascending, in order to obtain an abundant crop of silk of the best quality. At our first entering on this new and profitable business, we shall be under the necessity of trusting wholly to our rows of seedlings, as the only food we can offer to the worms. But when the trees planted out come to maturity, we shall

adopt the more systematic way of feeding, which experience has pointed out as most favourable; although, with us, the despatch of cutting down the seedlings for food, instead of the slow process of gathering leaves, will always remain an object of serious consideration.

The white mulberry thrives in all soils and situations, and will grow very rank and full of leaves upon low, moist ground; but the food it affords in such situations is very inferior, and apt to disorder the worms. A warm loam, even if gravelly, will give leaves of the best quality; and a sheltered, warm situation will produce leaves many days sooner than one which is exposed to cold, and is desirable on that account.

The mulberry-tree may be raised from suckers; and sometimes slips, stuck in a moist soil, will take root; if the low branches of a tree can be bent so as to be fastened, and covered in the ground, they will take root. The trees may be planted near buildings, for shade, or in a yard; the fowls are very fond of the fruit when it falls. A variety of situations will increase the means of early and late feeding, which is very desirable.

We shall conclude these remarks on the cultivation of the mulberry, by observing, that the most esteemed seed of that tree in Europe is that raised in Piedmont. The seed from Spain is also excellent. The seed of the best quality is large, bright, and heavy; when bruised, it will appear oily, and when thrown on ignited coals, it will crackle.

The next object to consider is, the *seed from which the worms are to be hatched;* and here it will be proper to observe, that one ounce of seed will produce about forty thousand worms, who will consume about one thousand pounds' weight of leaves, and produce from eighty to one hundred pounds of cocoons; and twelve pounds of cocoons will give about one pound of silk. It is of the greatest importance to procure the best seed, because that which is inferior will produce sickly worms, who will be much more exposed to the various disorders to which these insects are subject; a greater proportion will die, and those which survive will not make good cocoons. The best seed is of a dark grey colour, almost as dark as slate, looks bright, and if thrown into wine will sink. The seed which is light, of a white or yellow colour, and looks dull, is barren and good for nothing. The seed should be kept in a cool, dry situation, until the mulberry-trees have their leaves

opened; when the food is thus in readiness, then is the time to get it hatched. In Italy and France, at that appointed time, the women put the seed in small bags of worsted stuff, and place them in their bosoms, during the day, and at night under their pillows, for about forty-eight hours; at the expiration of which, the seed is transferred into boxes, over which a paper cover is fastened with many small holes, through which the little worms will creep. Some mulberry leaves should be placed on the paper, so that they may feed, which they will do as soon as they come to life. These boxes are placed on feather beds with pillows around them, in order to keep a uniform heat whilst the worms are hatching. Those which come to life in the course of the same day, should be collected and kept together; they will shed their skins, and ascend to make their cocoons, at the same period. The hatching of each successive day should be kept separate; this order will render their management and care easier, and more profitable. When the hatching has been well conducted, the heat proper and regular, most of the worms will make their appearance on the third or fourth day; and such seed as has not come to life on the fifth or sixth day is not worth preserving; for, if it should hatch, the worms will be weakly, and not likely to do well. If, on the second day, the seed that has been set to hatch should change colour, and appear red, it proves that the heat has been too great, and that the seed is spoiled.

In the middle provinces of France, where the climate is variable, and subject to sudden returns of cold, the cultivators are very cautious occasionally to exclude the outward air, by shutting the doors and windows, and always in the night and early part of the morning. Sudden cold, dampness, and especially foggy weather, are sure to injure the worms by bringing disease upon them, which will often prove fatal, and always reduce the quantity, and injure the quality, of the silk. A uniform temperature, not too warm, is considered as very desirable for the success of the silk crop; and about seventy-three degrees of the thermometer of Fahrenheit is the most suitable.

The silk-worms shed their skins four times, which is for them a period of sickness, during which they do not eat, but appear drowsy, and are more particularly affected by any sudden change of the weather to cold or damp. The first shedding takes place the sixth or seventh day after their birth; the head appears to increase in size, and they

cast off their skins. This time of trial for them will last three or four days, if the weather is warm and genial; but if it is cold and damp, they are much longer to get through it. As soon as the skin is cast off, they appear active again, eat with a good appetite, and will continue so for six or eight days, when the second shedding comes on under the same circumstances, and is succeeded by a third and fourth shedding. The second shedding is the easiest for them, and fewer die under its operation than during the first, third, and fourth. Eight days after the worms have got through the fourth shedding, and at the end of about six weeks from the commencement of their existence, they have arrived nearly to maturity, and are going to make their cocoons, and reward the care that has been taken of them. They want then to go up to spin their cocoons, but it is necessary not to encourage this natural disposition, until it is evident that they are fully ripe. If they go up too soon, their cocoons will be light and flimsy. The signs of their full maturity are, some change in their colour, which until then is white; the head appears wilted, the tail larger, the green circles round the body become of a bright gold colour, and they keep moving about among the others, but without eating, and seem as if stretching their heads for the purpose of spinning. When the worms exhibit these indications, they should be separated from the rest, and put into a place where small, dry branches of oak, hazel, white birch, or any other wood, have been prepared for them to ascend and spin their cocoons. When they have ascended, it will be some days before they begin to spin. The first day they lay out threads for a foundation—the second, they form the shape of the cocoons—the third, the worm is entombed and out of sight, but continues to spin (inside) until he has expended the whole of his stock of liquor, which, in general, is the seventh or eighth day. The thread of a good cocoon is about nine hundred and fifty feet.

It is highly important to feed the worms in that particular way which experience has shown to be the most suitable; the leaves, at all times, should be dry when given to them; therefore, when rain is likely to fall, it is necessary to gather in a stock, before they get wet; if the weather set in to steady rain, the leaves should be spread in a separate room, and dried before they are given to the worms; leaves wetted by rain, or dew, will either kill them, or bring on some bad disorder; from their birth to the second shed-

ding, they should be fed twice a day, morning and evening; afterwards three times a day, to the fourth shedding; and then, until they ascend, four, five, or six times a day, as they may seem to require it; from the fourth shedding until they ascend, their appetite is voracious, and it should be satisfied by an abundance of leaves of the best quality; those from old trees, matured by age, should be reserved for this period, and given to them fresh gathered and dry.

The worms, throughout the period of their existence, should be attended with great care and regularity; they should be kept perfectly clean, clearing away, often, the remains of the leaves, their own ordure, &c., which otherwise would create a disagreeable effluvia, and breed disorders among them; bad smells are very obnoxious to them, and no smoking of tobacco should be allowed where they are kept; they should be fed early in the morning, and good leaves should be given them regularly at the times appointed, that no waste of food may take place; the leaves should be fresh gathered, unless in rainy weather, and no leaves offered to them, that have been kept in the house until they have become yellow and sour, which will be the case, in general, after the third day; it is upon these attentions, that a good crop depends; half-starved, neglected worms, will give light, flimsy cocoons, whilst the diligent will get them heavy and rich; worms well attended to, and generously fed, will complete the crop within forty-five or fifty days; those that are neglected will languish over two months, and yield a light result.

The French and Italian establishments require large premises, and a great variety of utensils, such as benches, baskets, boxes of various sizes and shapes, to suit their extensive concerns; in the progress of time, it will become advisable for us to get acquainted with the minutiæ of their arrangements; but at the present day, we shall only point out such preparations as may be requisite to make a beginning, and which each individual concerned may afterwards increase and modify, according to his own views and situation.

Wherever silk-worms are to be raised in any number, it is evident that a room should be appropriated solely for that purpose; any aspect will answer, except north; the worms require heat, but it must be a free heat, that is, with a sufficient circulation of air; a close, sultry air is very bad for them, and so is a damp air; we would much prefer, on that account, a room up stairs to one on the ground floor; an unfinished room would answer very well; the doors and

windows ought to be closed whenever a sudden transition to cold or damp takes place, or a thunder-storm comes on, which, oftentimes, will prove an injury to these insects; shelves or boards, put up round the room, would be very convenient to keep the worms on, and, if requisite, a frame in the centre of the room, with shelves one over the other, sheets of large, stiff paper, or of pasteboard, with the edges turned up all round, and stitched at the corners, would answer very well to keep and feed the worms in, and when they are to be cleaned, new leaves might be put in a fresh paper, and laid by the side of that which wants cleaning; the worms would leave it quickly to go to the fresh leaves.

It will be necessary to appropriate a corner for the diseased worms; in the most favoured crop, there will be many, and they ought to be taken away immediately, from among the rest, and put into the hospital to recover, otherwise the contagion may extend, and a great loss ensue.

After the cocoons are made, the first care is to take them down from the brush, clearing away the loose silk by which they are fastened, and selecting the best, those that feel hard and substantial, and of the brightest colour, to keep for seed; the most desirable are the worms, which, at the hatching time, came to life first; they prove to be the most hardy, and will make the best stock; it is necessary to keep an equal number of each sex; the male cocoons are the longest and thinnest, pointed at both ends; the females are larger and rounder, blunt at both ends, and resembling somewhat in shape a hen's egg; these chosen cocoons are to be threaded with a needle, in strings of fifty, more or less, taking great care to run the needle slightly through the silk, without hurting the chrysalis which is inside; these strings are to be hung against the wainscot of the room, and, in the course of from fifteen to twenty days, the millers will come out, males and females; the males always come out first; the females are the whitest and the largest; the males appear most active, and shake their wings. It is necessary to procure pieces of woollen cloth, (the Italians always use scarlet,) and to place the millers on them in rows, male and female by the side of each other; after pairing, the male dies; the female soon lays her seed on the cloth; it appears as if glued on; a female yields about three hundred seeds; they are first white or yellow, and change to various hues, and finally, if good, become and remain of a dark grey. The Italians preserve the seed on the pieces of scarlet cloth, and at the proper time their women

wear them in their bosoms, as observed before, to hatch it. The French are in the habit of scraping the seed off from the cloth, and by wetting, slightly, the back of the cloth, it will come off easy, and without injury; they put it up, then, in small bags; whether it is scraped from, or left on the cloth, it should be packed carefully, and preserved over the winter, in a *dry* place, *where it does not freeze, and where it is not too hot;* if it should freeze, the principle of life would be destroyed, and if it should be too warm, the seed would start for hatching, and would be lost; one hundred pair of cocoons will weigh about one pound, and give about one ounce of seed.

Persons who intend to make a business of raising silk should raise their own seed; it is too important a part of the concern to intrust to strangers; they should pay the most particular attention to the choice of the cocoons, which they select for seed, and to the preservation of that seed through the winter. The French use stoves to warm occasionally the rooms, where the worms are reared, and thus secure them against any unexpected return of cold weather, and perhaps it may be requisite to use that caution in such parts of New England, as are much to the north or west of Boston; in its neighbourhood, and farther south, we believe that it would not be necessary, and that the only caution requisite, would be the closing of doors and windows, whenever a sudden change in the weather might require it. We have observed before, that hot weather is favourable for the worms, and they can bear it to a high degree, provided it is not sultry and close; on that account, the room where they are kept should be so situated, and the windows so arranged, that there may be at any time a thorough draft, when wanted, so as to prevent that deadness of air, and unpleasant smell, which would greatly endanger the health and lives of the worms; in extreme cases of sultriness, the French are in the habit of burning a small quantity of nitre, in an earthen ware dish, which greatly improves the atmosphere of the premises; it may also answer a good purpose, in such cases, to heat a brick or a stone, and throw on it some vinegar.

Respecting the hatching, from the information we have obtained of individuals who have attended to that business in our country, nothing is required, when the proper time comes, but to place the seed in a warmer room, but not to the sun, and it will hatch naturally in the course of a short time; it will take several days, and a longer time than when

assisted by human heat; but which is the best, and preferable method of the two, for our climate, time and experience must determine; the French and Italians think the finest crop is generally secured by hastening the worms through the various stages of their existence, from the hatching to the ascending, and that any check or delay is to be esteemed as unfavourable to the ultimate success; hence their vigilance to secure an even temperature in the apartments, an abundance of food for the worms, adapted to their age, in its quality, a perfect and constant cleanliness, and such an arrangement of the windows, doors, and traps in the floors, as to ensure a free circulation of air, and to prevent that suffocating and offensive atmosphere, which would undoubtedly occasion a great mortality among them. The cocoons will not be of a uniform colour, they will be of various shades of yellow, and some white, yet they all are of one and the same species, and may all be worked together; after the cocoons are gathered, and cleared of the flos silk, which fastened them to the brush, they should be reeled without delay, and before the millers come out, for if the silk is left on until then, the quality is thereby injured; they should be thrown into a kettle of hot water, a small quantity at a time, and stirred with light, clean rods; this will dissolve the tenacious gum by which the threads adhere together; female industry will search out the end of the thread, and wind and spin the threads from ten to fourteen cocoons together into one single thread, with that care and correctness which will make a silk perfectly even, and perfectly clean.

Here we could enter into minute details, and furnish drawings of such winding and reeling machines as are used in the large Italian and French establishments, but we consider that, at the present early period, it would have a tendency to fatigue and perplex the attention of such of our readers as may wish to embark in a trial; their first attempt will probably be upon a limited scale, and undoubtedly the simple means used for winding and reeling in this state and in Connecticut, which may be more easily learnt by actual view than by tedious descriptions, will be found amply sufficient, and, as we progress in the business, our own intelligence and experience, gradually assisted by further information respecting the practice of Europe, will make us fully acquainted with the best process. When it is not convenient to wind and reel all the cocoons at that time, then all the millers must be destroyed before they come out, in order

to save the silk from injury; this may be done in the following manner;—a kettle of hot water must be prepared, and, when boiling, a sieve, filled with cocoons about three or four inches thick, may be placed over the kettle, so as to receive the hot steam without dipping in the water; a wooden cover may be placed over the sieve to confine the steam, and, after leaving it in that situation for about ten minutes, you throw the cocoons into a cloth, and wrap them up in it, that the heat may be sure to penetrate into them, and destroy the life of the chrysalis; they must, immediately afterwards, be spread in the sun to dry thoroughly, and then be put away on shelves, or on a floor, spread very thin, that the dead insects within may dry up and harden, otherwise they might corrupt there, and stain the silk; when this is done, the cocoons may be kept, if convenient, for three years, without any ill effect to the quality of the silk, which will wind easily, and be as good as if it had been wound immediately, but will not appear quite so bright.

At the opening of the season, the object to attend to is, as soon as convenient, to procure good seed of the white mulberry, and to sow it in rows as before directed, hoeing the young plants carefully and frequently, to keep them free from weeds, and as thrifty as possible, that they may gain strength not to suffer from the first winter: the second spring after sowing, they will be in a good condition for gathering, and feeding the worms; nay, any person, who should feel desirous of driving the business, might begin to use them the first spring after sowing, and keep one sowing in reserve, not to be used until the third year, when the plants, being better rooted, and stronger, could bear, without any ill consequences, to be cut down near the ground, and would soon be up again for a second crop; it would be desirable to transplant some of the young trees into edge rows, placing them at the distance of two feet apart, and suffering them to grow in the manner of bushes, which would be convenient for gathering the leaves; some also should be transplanted to grow singly with a butt; such trees (as mentioned before) will give the best and most substantial food; thus the drills of seedlings would give the earliest and tenderest food for the little worms at their birth, the leaves of the edge-rows would afford a food next in substance, suitable after the second shedding, and the eaves of the mature standard trees would, after the fourth shedding, offer to their voraciousness that substantial food, which is very requisite, at that time, to satisfy them, and to

ensure a rich and heavy crop; choosing for the whole plan tation a piece of sheltered, high ground, sweet and well laid to the sun, and planting ridges, hedges, and trees, in such a manner as will give to all the uninterrupted benefit of the light and heat of the sun.

Fully aware of the importance of the object we have presented to the attention of the community, we cannot leave it, without making a concluding appeal to the intelligence and energy of our countrymen, not to suffer any delay to take place in setting their hands to a work so promising of results the most favourable to our comforts, and for our welfare: the first step is within the farmer's immediate department, to sow the mulberry-seed, and rear the young trees; and after two years of attendance, the silk raising may commence in good earnest, and will become a healthy and pleasant business for children and young women. This rich crop will require but two months' care to secure it, and, when the business shall flourish on a large scale, which we may anticipate as probable within a short period, the raising of the cocoons will become a distinct occupation for farmers' families; the winding and reeling of them, most probably, will be carried on as a distinct and separate branch of industry; this is actually the case in all the silk-growing countries, where the cocoons are carried to the public markets, and sold for ready cash to those who keep filatures, where they wind and reel them.

Great advantages will accrue to the younger members of farmers' families, in cultivating so pleasant and profitable an employment at home: it will offer to many young women a choice between home and the factories, and a resource in case the liberal encouragement given to manufactures should eventually prove the cause of business being overdone; it will also offer valuable resources for the pauper establishments, where the old and infirm, under a discreet and judicious government, may be made to provide themselves a comfortable support. If we take a retrospective view of the affairs of mankind, since the times of early record, we find that the riches and the prosperity resulting from commerce and navigation, or from a system of extensive manufactures, however brilliant, are comparatively of short and uncertain duration; the changes of views and systems of a government at home, the changes of policy among foreign nations, render the whole fabric subject to many sudden and unforeseen vicissitudes, and dependent upon the results of relations abroad, and of the compromise

of jarring interests at home, setting at defiance, in the course of time, the subtle calculations of the most accomplished statesman; but the prosperity which is founded upon a perfected agriculture, that combines with intelligence the abilities of the soil and climate, so as to naturalize, by industry, rich crops of products, unknown to its original situation, is a prosperity not liable to changes; it becomes inherent and lasting. Of the great results of a rich cultivation upon the circumstances and ability of a people, Italy affords a convincing illustration: although groaning under bigotry and priestcraft, without foreign commerce, and without foreign navigation, yet, at various periods, three or four years of peace, with good crops of silk and oil, (silk is the richest,) have filled the country again with competence, after the dreadful devastations of war.

There is a certain order in society, the members of which, although not united by the bonds of corporate privileges, although unknown to, and unacquainted with, each other, yet move on with a steady and harmonious step to one common end,—the prosperity of their country, the welfare of all its inhabitants; to them, the powerful Bearers of Light, respectfully, we would recommend the consideration of the object of these lines, and if their judgment joins in accordance with our own, we invite them to endeavour to accelerate its completion, and to save it from a lingering course through one or two generations. The knowledge of the rearing of silk was imparted, in the course of about six hundred years, by Greece to neighbouring Italy, and in about three hundred and forty years more, it was communicated across the line between Italy and France; thus the progress was slow indeed; but such are the miserable results of ignorance and bad policy.

We would repeat, that the first step is to prepare an abundance of food for the silk-worms by stocking our warm, light lands with white mulberry-trees; accordingly, wherever there are now white mulberry-trees bearing fruit, the fruit should be carefully collected, when fully ripe, and the seed should be washed out, dried, and preserved; it will be much wanted, and it is both the duty and the interest of the owners not to suffer even the smallest part to go to waste.

SKIRRET.—*Sium sisarum.*—"The skirret is a perennial tap-rooted plant, a native of China. The lower leaves are pinnated, and the stem rises about a foot high, terminated by an umbel of white flowers, in July and August. The

root is composed of fleshy tubers, about the size of the little finger, and joined together at the crown or head: they were formerly much esteemed in cookery. In the north of Scotland, the plant is cultivated under the name of *crummock*.

"*Culture.*—This plant grows freely in a lightish soil, moderately good. It is propagated both from seed, and by offsets of established roots. The better method is, to raise seedlings, to have the root in perfection, young and tender.

"*By seed.*—'Sow between the 21st of March and the 15th of April; a fortnight later, rather than any earlier, for a full crop, as plants raised forward in spring are apt to start for seed in summer. Sow on an open compartment of light ground, in small drills eight inches apart. When the plants are one or two inches high, thin them to five or six inches asunder. They will enlarge in growth till the end of autumn; but before the roots are full grown, in August, September, or October, some may be taken up for consumption as wanted: those left to reach maturity will continue good for use throughout winter, and in spring, till the stems run.'

"*By slips.*—'Having some plants of last year's raising, furnished with root-offsets, slip them off; taking only the young outward slips, and not leaving any of the larger old roots adhering to the detached offsets; which plant by dibble, in rows from six to nine inches asunder. They will soon strike, and enlarge, and divide into offsets; which, as well as the main roots, are eatable, and come in for use in proper season.'

"*To save seed.*—Leave some old plants in the spring; they will shoot up stalks, and ripen seed in autumn."—*Loudon.*

"*Use.*—The tubers are boiled, served up with butter, and are declared by Worlidge, in 1682, to be 'the sweetest, whitest, and most pleasant of roots.' "—*Loudon.* The common skirret has an agreeable aromatic flavour, and abounds with saccharine particles: hence it has been conjectured that sugar might be advantageously extracted from the root; and M. Margraff states, that he obtained one ounce and a half of pure sugar from half a pound of this vegetable. In a medicinal view, it possesses diuretic properties, and is in a slight degree stimulant.—*Dom. Encyc.*

SPINACH, *or* SPINAGE.—*Spinacia oleracea.*—The common spinage is an annual plant, but it is not known of what country it is a native. The leaves are large, the stems hollow, branching, and, when allowed to produce

flowers, rising from two to three feet high. The male and female flowers are produced on different plants: the former come in long terminal spikes; the latter in clusters, close to the stalk at every joint.

Varieties.—Russell's Catalogue contains the following:—

Round-leaved, or summer;	Holland or lamb's quarter;
Prickly, or fall;	New Zealand, *tetragona expansis*, (a
English patience dock, *rumex patientia, (for early greens;)*	*valuable new sort.)*

Times of sowing.—"The round is sown in April—the others from August to September. The prickly is sown in August and September for early spring greens."—*Russell's Catalogue.*

Soil and situation.—As the excellence of *spinaceous* plants consists in the succulency of the leaves, almost every thing depends on giving them a rich soil, stirring it frequently, and supplying water in dry seasons. The space they occupy in the garden is not considerable, say a thirtieth part; more especially as some of them, the common spinage for example, often come in as a temporary crop between rows of peas or beans, or among cauliflowers, broccoli, &c.

Seed and process in sowing.—"When raised by itself, spinage is generally sown broad-cast, and two ounces will sow a bed four feet and a half by thirty feet; but in drills, one ounce will sow the same space. In drills it is easier to weed and gather: let the drills be from nine to twelve inches apart. Beds four feet wide, with small alleys, are convenient of access. Let the ground be thoroughly dug. Whether broad-cast or in drills, sow thinly, and rake or earth in about an inch deep.

Subsequent culture.—"When the plants are up, showing leaves about an inch broad, clear them from weeds, either by hand or small hoeing, and thin the plants, where crowded, (especially the broad-cast crops,) to three inches apart; and, when advanced in growth, every other may be cut out for use, increasing the distance to about six inches, that the remainder may grow stocky, with large spreading leaves. The plants of the early and succession crops attain proper growth for gathering in April, May and June. When the leaves are from two to five inches in breadth, cut the plants clean out to the bottom, or sometimes cut only the largest leaves. But as soon as there is any appearance of their running to seed, they may be drawn out clean as wanted."

To save seed.—"To obtain seed of the round-leaved, leave a sufficient quantity of established plants in April, May, or June, to run up in stalks; or transplant in autumn some of the spring-sown which have not run. To save seed of the triangular spinage, transplant, in March, some good strong plants, of the winter crop. For large supplies, a portion of each may be sown in February, or the first fortnight of March, to stand wholly for seeding. Sow each sort separate. Respecting both sides, observe that they are of the class *Diœcia*, the male and female flowers growing separately, on two distinct plants. When the plants are flowering for seed, the cultivator should examine whether the male plants, distinguishable by the abundant farina upon the blossoms, stand crowded or numerous to excess; in which case he should pull up the superfluous plants, leaving a competency for fertilizing the female blossoms, which else would prove abortive. And when the female blossoms are set, it is best to dispose of all the male plants, drawing them by hand; which will give more room to the females to grow and perfect their seed. The plants rejected may be profitably given to young pigs. The seed ripens in July and August."—*Abercrombie.*

Use.—"The leaves are used in soups, or boiled alone, and mashed, and served up with gravies, butter, and hard-boiled eggs. The leaves may be obtained from sowings in the open ground at most seasons of the year, but chiefly in spring, when they are largest and most succulent."—*Loudon.* "According to the opinion of French physicians, this plant is not only food, but physic, and is hence emphatically called '*Le balai de l'estomac*'—the broom of the stomach—sweeping and deterging every hole and corner of that organ, without giving pain, or in any degree interrupting the ordinary avocations of the persons employing it."—*Armstrong.*

SQUASH.—*Cucurbita melo pepo.*—The squash is a species of the *cucurbita*, and seems to be the link which connects the melon and pumpkin.

The *varieties* mentioned in Russell's Catalogue are—

Early bush summer;	Commodore Valparaiso, (*grows large, and is highly esteemed;*)
Long crook-neck, or bell;	Canada crook-neck; (*small, and of superior quality.*)
Vegetable marrow;	
Acorn;	

"Squashes, of every kind, may be cultivated as directed for cucumbers and melons—should be sown at the same time, and at similar distances, with this difference, that two

plants of these will be plenty for each hill, and that they are easier pleased with soil and preparation than the others."—*M'Mahon.*

Use.—The squash is applicable to all the uses of the pumpkin, and, for many purposes, is superior to that vegetable.

STRAWBERRY.—*Fragaria.*—The substance of the following article was written for this work, at the particular request of its compiler, by a gentleman of Boston, whose success, as a practical, is equal to his skill as a scientific horticulturist; and whose liberality in imparting his knowledge, as well as the results of its successful application in introducing excellent varieties of fruits, merits the thanks of the community.

Varieties.—Every year is producing new varieties of this as well as almost all other fruits, from the care and attention which are bestowed on them by the scientific cultivators of Europe, among whom, at the present day, Mr. Knight, the president of the London Horticultural Society, seems to take the lead.

Society owes much to these gentlemen, and they are constantly receiving the reward of their labours from the many and continued testimonies of approbation, which their success calls forth. But their chief gratification is derived from the pursuit itself, which, above all others, is calculated to soothe and tranquillize the mind, and to lead men to "look through Nature up to Nature's God."

The kinds most esteemed in England are the pine, imperial, Bostock, Surinam, Bath scarlet, Downton, roseberry, Hudson Bay, large scarlet, musk hautbois, round hautbois, and flat hautbois.

In France, the Bath scarlet is of long standing, and much esteemed. The white, the Alpine, or monthly, and the Chili, are also favourites.

The *Chili* is a shy bearer, but very large when it comes to maturity—is not, I believe, known here: it stands on a stiff, upright, and strong stem, in lieu of a pendulous one, like the Hudson.

The *Downton* is, however, I believe, a larger strawberry, and is uncommonly high flavoured. There are other new varieties very large, of which I know nothing. The form of the Downton is various; many of them are shaped like a cock's comb, which name it has obtained in some horticultural works. It was raised from seed by Mr. Knight,

at Downton, the name of his estate, and is a very good bearer.

The *roseberry* is, in point of flavour, surpassed by no cultivated strawberry I have seen. It resembles, in form and flavour, the Alpine, but is a better bearer. This last,

The *Alpine*, is a monthly strawberry; it continues in bearing from June until October in this climate—is like the wood-strawberry in form and flavour, but is a shy bearer.

The *scarlets* are all large and fine fruit; the largest variety are fine flavoured and very early. They are not very great bearers, but should be cultivated as valuable varieties, as well as for their beauty and excellent qualities.

The *hautbois* is the favourite English strawberry. It is totally different from what is commonly called the hautbois in this country. The flat hautbois grows generally on the top of the vines—is brown, and greenish white when ripe —fine flavoured, pretty good bearer, but difficult to detach from its stalk.

The *round hautbois* is of a dark purple when ripe—is somewhat in form like the common red strawberry, but larger; and the

Musk hautbois is like the preceding—a shy bearer, but very delicious.

The *wood-strawberry* is far before any other in point of flavour, and, if transplanted into gardens, may for two or three years answer very well; and if not too highly manured, preserve their flavour and increase their size. But new plants must be obtained, every two or three years, from the woods, to make new plantations, or they will degenerate.

Soil and manure.—The soil proper for this last mentioned variety, as well as all others, is light, warm, and gravelly; and the manure to be applied should be exclusively vegetable, and not animal manure. The usual practice is to manure the ground with rotten dung, with a view to increase the size and quantity of fruit; but, in doing this, the flavour of the fruit is destroyed in proportion to the richness of the soil. Besides, high manuring produces strong vines and little fruit. Rotten leaves, decayed wood, ashes, in small quantity, mixed with other vegetable substances in a compost heap, will make better manure for strawberries than any animal substance whatever. As the vines which bear this fruit require great moisture to bring the fruit to its proper size, the soil and situation in which they are placed must not be too dry.

Propagation.—The usual time for transplanting strawberry-plants is August. That time is chosen because they have then done bearing, and have made offsets, if the season has been favourable, of strong plants, set from their runners. Plantations made at this season will bear some fruit the next summer. But, if you can get good vigorous plants in May of the preceding season, I prefer to plant then, as it saves a year, nearly, the plants being ready to bear abundantly the next year.

Gardeners have different habits and opinions as to trimming the plants when they are put out. Some cut off all the old leaves, and preserve only the *naissant* leaves in the centre of the plant. Others take off the dead or decayed leaves only, and plant with all the old healthy leaves on the plant. This last plan is highly recommended by the Abbé Rozier, but, so far as my experience goes, I have found the first mentioned course the best. Many people cut the roots in before they put them into the ground: all dead substances should be cut off, but not the roots. When the plants are put out, they should be kept free from weeds, and the ground should be kept loose about them. If the plants are strong, put but one to form the stools; if weak, put two.

As regards the distance at which plants should be set, cultivators differ. The common red strawberry, which is found in all our gardens, may be put eight inches apart in rows nine inches or a foot from each other, and allowed to form a matted bed of eighteen inches or two feet wide, with a foot-path of a foot wide between them. But the larger and finer sorts should be planted in stools in beds four and a half feet wide, with a path of fifteen inches or more between the beds. In these beds the plants should be set, by a line, fifteen to eighteen inches apart, both ways, taking care to set them in quincuncial order, and to keep them from running together.

The objection generally made to this mode of cultivation is, that the fruit is exposed to be injured by lying on the ground, where it is bruised and covered with dirt every time it rains. This, however, may be prevented by a little care. In some parts of Europe, where moss is plenty, it is collected and put round the stools, so as to prevent the fruit from lying on the ground, and at the same time to prevent the moisture round the plant from evaporating.

In some places, where moss is not to be got, straw is used

for the same purpose; hence the English name of strawberry.* But I think that leaves of trees that have been collected in the spring, and kept under cover, are better than either, and particularly the oak-leaf; because, when they are no longer wanted to protect the fruit, and keep the moisture in the ground, they can be dug in round the stools, where they serve as most excellent manure for this delicious fruit.

The strawberry may also be propagated by seeds. Knight, in making experiments, with a view of ascertaining whether most of the sorts would not breed together indiscriminately, raised above four hundred varieties, "some very bad, but the greater part tolerably good, and a few very excellent." The fruit of above a dozen sorts was sent to the Horticultural Society [in London] in August, 1818, and found of various degrees of excellence. The seeds, if sown immediately after gathering, will produce plants which will come into bearing the following year.—*Loudon.*

"*Use.*—The fruit is fragrant, (whence *fragaria,*) delicious, and universally esteemed. It consists almost entirely of matter soluble in the stomach, and neither there nor when laid in heaps, and left to rot, does it undergo the acetous fermentation. Hence it is very nourishing, and may be safely eaten by gouty and rheumatic persons. 'In addition to its grateful flavour, the subacid juice has a cooling quality, particularly acceptable in summer. Eaten either alone, or with sugar and cream, there are few constitutions with which strawberries, even when taken in large quantities, are found to disagree. Further, they have properties which render them, in most conditions of the animal frame, positively salutary; and physicians concur in placing them in their small catalogue of pleasant remedies. They dissolve the tartareous incrustations of the teeth. They promote perspiration. Persons afflicted with the gout have found relief from using them very largely; so have patients in cases of the stone; and Hoffman states, that he has known consumptive people cured by them. The bark of the root is astringent.'—*Abercrombie.*"—*Loudon.*

SUNFLOWER.—*Helianthus annuus.*—This plant is a native of South America, but naturalized and become com

* This name is common in all the northern countries, while in France, and countries south, it is said they take their name from their flavour, or the botanical name *fragaria.*

mon in the United States. It is easily propagated in any common soil, either by sowing the seeds, or by slips or offsets from the roots.

From a paper on the subject of sunflower-oil, in the first vol. of *Trans. Amer. Phil. Society*, it appears that one bushel of seed yields three quarts of oil; and that this quantity of seed is produced from one hundred plants, set about three feet apart, in the same manner that Indian corn is planted. The oil is thin, clear, and of an agreeable taste.

The process for expressing the oil is the same as that of making linseed-oil.

TANSY.—*Tanacetum vulgare.*—Tansy is a perennial plant, which grows without cultivation in Great Britain and in some parts of the United States.

Culture.—Tansy may be propagated in spring or autumn by rooted slips, or by dividing the roots into several sets: plant them in any compartment of the kitchen or physic garden, from twelve to eighteen inches asunder. The plant continues for several years, producing abundant tufts of leaves annually. As they run up in strong stalks in summer, these should be cut down to encourage a production of young leaves below on the stem. To have young tansy in winter, plant some roots either in a hotbed, or in pots placed therein, or in a pinery, or forcing house, at any time from November to March.—*Abercrombie.*

Use.—"The young leaves are shredded down, and employed to give colour and flavour to puddings; they are also used in omelets and other cakes, and were formerly in much repute as a vermifuge."—*Loudon.*

TARRAGON.—*Artemisia dracunculus.*—*Culture.*—This is a perennial plant, which may be propagated from seed, or from slips or offsets, in the same manner that tansy, mint, &c. are cultivated.

Use.—"Tarragon is frequently used in salads, especially by the French, to correct the coldness of other herbs. The leaves make an excellent pickle: they have a fragrant smell and aromatic taste. The use of them in Persia has ever been general, at meals, to create an appetite. The famous vinegar of Maille, in France, owes its superior flavour to this plant, which is now common in Pennsylvania."—*Dr. Mease.*

TEASEL.—*Dipsacus.*—The teasel or fuller's thistle is an herbaceous biennial, growing from four to six feet high, prickly or rough in the stem and leaves, and terminating in rough, burr-like heads of flowers.

Propagation and culture.—This plant is propagated by sowing the seeds either in March or April, upon a soil that has been well ploughed, and it is observed that good wheat-land is well adapted for the production of teasels. The ground being ploughed and made fine, from one peck to two of seed is generally sown upon an acre, and harrowed in with a light harrow. When the plants are up, hoe them in the same manner as practised for turnips, thinning out the plants from time to time, till eventually they are left about a foot apart. They should be kept clear from weeds, and the second year after sowing, the plants will shoot up stalks with heads, which are collected in August, as soon as they begin to turn brown. They are then exposed daily to the sun till they become perfectly dry, care being taken to protect them from rain. They are to be collected as they turn brown and ripen, and not all at once.

Use.—This plant is cultivated in great quantities, in the west of England, for raising the nap on woollen cloths, by means of the crooked awns or chaffs upon the heads; which in the wild sort are said to be less hooked. For this purpose they are fixed round the circumference of a cylinder, which is made to turn round, and the cloth is held against them. For a more detailed account of the culture of this plant, see *Encyc. of Agr.* p. 852, *N. E. Farmer*, vol. vi. pp. 307, 322.

THYME.—*Thymus vulgaris.*—There are, according to Loudon, two species of thyme, cultivated for culinary purposes, the *common* and the *lemon* thyme.

Common or *garden thyme* is a native of Spain and Italy. Of this there are two varieties, the broad and the narrow-leaved, besides the variegated, grown for ornament.

Lemon thyme—T. citriodorus—is a very low evergreen shrub, trailing, and seldom rising above four or six inches in height. It is distinguished by its strong smell of lemons.

Culture.—The plant is best raised from seed. Sow as early in the spring as the season will permit, in a bed or border of light, fine earth, either broad-cast, scattered thin, and raked in lightly, or in small, shallow drills, six inches asunder. The after-culture is simple, and similar to that of other sweet herbs, such as marjoram, sage, &c. "In soils which are cold, stiff, or moist, it does not thrive; its branches become ragged, its leaves few, and its flowers, and their peculiar aroma, feeble and faded."—*Armstrong.*

Use.—"The young leaves and tops are used in soups, stuffings, and sauces. For these purposes, the broad-leaved

common is generally preferred; but the flavour of the yellow is much liked in peculiar dishes."—*Loudon.* "All the parts of this plant, but particularly the calyx of its flower, yields an essential oil, yellow and odorous, and highly charged with camphor. In the kitchen, it is used as an ingredient in sauces and stuffings, and in what are technically called *forced meats.*"—*Armstrong.*

TOMATO.—*Solanum lycopersicum.*—"This plant is of the same family with the potato, and, like it, is a native of Southern America. It has several species, two of which fall under our notice as garden vegetables, and are distinguished from each other only by a difference of size. The smaller is held to be the parent plant, and has the advantage of ripening sooner, and better resisting cold weather. To have an early crop, sow the seeds in a dry and warm soil, and sheltered situation, in October, and cover the bed with straw, or stable-litter, during the winter. For summer and fall use, sow again in May, and water freely. If the soil and situation be favourable, and the culture proper, the product will be great. The distance between the plants should not be less than two feet."—*Armstrong.*

Use.—"When ripe, the fruit, which has an acid flavour, is put into soups and sauces, and the juice is preserved for winter use, like ketchup; it is also used in confectionary, as a preserve, and, when green, as a pickle. Though a good deal used in England, in soups, and as a principal ingredient in a well known sauce for mutton, yet our estimation and uses of the fruit are nothing to those of the French and Italians, and especially the latter. Near Rome and Naples, whole fields are covered with it; and scarcely a dinner is served up, in which it does not, in some way or other, form a part."—*Loudon.*

TURNIP.—*Brassica rapa.*—Russell's Catalogue contains the following *varieties:*

Early white Dutch;
Early garden stone;
White flat, or globe;
Green round;
Red round;
Swan's egg;
Large English Norfolk,
Long tankard, or Hanover;
Long yellow French;
Yellow Dutch;
Yellow Maltese;
Yellow Aberdeen;
Yellow stone;
Yellow Swedish, Russia, or ruta baga;
Dedham.

The first three sorts are fittest for early, first succession, and main crops. The French turnip, according to Loudon, is of excellent flavour, and is in high repute in France, Germany, and Holland. The Swedish, for its large size and

hardy nature, is extensively cultivated in fields for cattle; it is also occasionally raised in gardens for the table, to use in winter and spring.

Seed estimate.—For a seed-bed four feet and a half by twenty-four, the plants to remain and be thinned to seven inches' distance, half an ounce.

Time of sowing.—Make first a small sowing of some of the early sorts, in the last fortnight of March or the first days of April, for turnips in May and June; but, as these will run to seed the same season, make a larger sowing about the middle of April. The first considerable sowing may be about the middle or towards the end of May, for roots to draw young about the end of June, and in full growth in July and August. The principal sowing should be about the middle of July. "Doing it on a set day is ridiculous; for a time should be chosen when the ground has the right degree of moisture to make the seed vegetate; and if this should happen a week earlier or a fortnight later than the usual time, it need not be regretted; but the opportunity ought to be embraced."—*Abercrombie.* They may be sown to advantage in New England as late as the first week in August; and those which are put into the ground so late will be less liable to be injured by insects than when sown earlier.

Soil and situation.—Sand or gravel, with a mixture of loam, produce the sweetest and best flavoured roots. It should be made fine, but not too rich, lest the turnips be rank and ill tasted. Ground which has been newly cleared from the forest yields the largest and sweetest roots; and on such spots there is least danger from insects. "Next to new land, swarded ground is to be chosen for a crop of turnips; and the way to prepare it is, to plough it pretty deep in the spring, and fold it by turning in the stock for a good number of nights; for there is scarcely any of our fields sufficiently rich to produce turnips without manuring; and folding hitherto appears to be the best method of enriching the ground for this purpose. It should be well harrowed as often as once a week, while the folding is continued, to mix the excrements of the cattle with the soil." —*Deane.*

Process in sowing, and precautions against the fly.—"Let the ground be well broken by regular digging, and neatly levelled to receive the seed. Procure bright, well dried seed. At a season when the turnip-fly is not apprehended, the seed may be put into the ground without any prepara-

tion, either alone or mixed with a little sand; but in the hot weather of summer, it is advisable to use some cheap and effectual preventive of the fly. It appears from a trial of Knight, at the suggestion of Sir Humphrey Davy, that lime slaked with urine, and mixed with a treble quantity of soot, if sprinkled in with the seed at the time of sowing, will protect the seeds and germs from the ravages of this pernicious insect; but this antidote cannot be conveniently applied unless the sowing be in drills. A yet simpler emedy, found by Mean to be perfectly successful, is, to steep the seed in sulphur-water, putting an ounce of sulphur to a pint of water, which will be sufficient for soaking about three pounds of seed."—*Abercrombie.*

The method of sowing is either broad-cast or in drills. In the former mode, Abercrombie directs to allow half an ounce of seed for every one hundred square feet. Deane says, the quantity of seed for an acre is never less than one pound—more frequently a pound and a half, and sometimes two. In sowing by broad-cast, the seed may be covered by drawing a "light harrow backward, that is, wrong end foremost, to prevent the tines, which are generally set somewhat pointed forward, from tearing up the sods, and burying the seed too deep." If sowed in rows, the drills may be an inch deep, and twelve or fifteen inches asunder.

Subsequent culture.—As soon as the plants have rough leaves, about an inch broad, hoe and thin them to six or eight inches' distance, cutting up all weeds. As the turnips increase in the root, a part may be drawn young, by progressive thinnings, so as to leave those designed to reach a full size ultimately ten or twelve inches apart.

Taking and preserving the crop.—In England they feed the turnips off the ground with sheep, or draw them up for neat cattle, through the winter, as they are wanted; but, in this country, they must be harvested in autumn, about the end of October, or even earlier in some seasons and places, and stored and saved, as directed for preserving other roots. See page 50.

To save seed.—"Some of the best roots of the middling size should be planted early in the spring, in a good spot, free from shade. They should be in rows, eighteen inches asunder, and the ground must be kept clear of weeds till the seed is ripe. Stakes and laths may be needful round the outside, to keep the branches from falling to the ground before the seed is fully ripe."—*Deane.* "It is preferable, however, to procure turnip-seed, as indeed that of most

other vegetables, from the regular seedsmen; as the seed farmers have opportunities of keeping the sorts distinct, which cannot be within the precincts of a walled garden." —*Loudon.*

Use.—The common culinary uses of the turnip, boiled, mashed, &c., are too well known to need any notice We shall mention some uses not so common.

"*For feeding horses.*—These, when fed on turnips, are induced to eat the barn-chaff, and other dry food, with a good appetite—are kept healthy, and will work without corn.

"*For feeding cows.*—To make sweet and well tasted butter from the milk of cows fed on turnips, let the milk vessels be kept constantly clean and well scalded with boiling water, before using. When the milk is brought into the dairy, to every eight quarts mix one quart of boiling water, then put up the milk into the bowl to stand for cream.

"*As a substitute for bread.*—When the dearness of all sorts of corn occasioned many poor people in Essex [England] to make bread of turnips, they took the peeled roots, and boiled them in water till they were soft; then, strongly pressing out their juices, they mixed them with their weight of wheat-meal; and adding salt, yeast, and warm water, they kneaded it up as other paste; which, having lain a little while to ferment, they ordered and baked as common bread."—*Gleanings in Husbandry.*

VINE.—*Vitis.*—Many gentlemen in this neighbourhood have given considerable attention to the cultivation of grapes in the open air upon open trellises, and some have succeeded remarkably well, although they have had to contend with the many difficulties which that delicate and delicious fruit is subject to in this climate.

Having given some personal attention to this fruit for several years, I am satisfied that it can be raised in great perfection, and with little trouble to the cultivator, if he set out right in the first instance, and follow up the system prescribed with attention and care.

Although most men, who have any knowledge in horticulture, know more or less respecting the mode of cultivating this plant, yet there are many new beginners, who may collect some hints from these notes, which may aid them in the outset; and many gentlemen, who have been long in the habit of raising grapes in their gardens, may obtain some information as to the means of preserving the plants from the destructive insect which has of late years

attacked the vines, and destroyed the promise of their early growth and the fair appearance of their fruit.

The best treatises on the subject of raising grape-vines recommend planting the cuttings in pots; but in this country it is entirely unnecessary, as the plants may be easily raised in the open grounds with little trouble and no expense; and if we can add to our collection of fine fruits one, which, in sickness as well as in health, is the most refreshing and nutritive of any that we possess, with little expense, and even with profit to the cultivator, we shall do a great good.

The best mode of raising the plants is by cuttings taken from the vines at the fall pruning, and preserved in earth till spring. These may be made either of one eye or bud, or of four or five, attached to a small portion of the two years' old wood, forming a cutting in the shape of a small mallet.

The 1st year.—They may be raised in a small nursery-bed, prepared of a good light soil—set in the ground six inches distant from each other, with the rows wide enough apart to permit them to be weeded with a narrow hoe; or, they may be put, in the first instance, where they are to be reared, and left to grow, at the distance of five, six, or seven feet, or more, according to the wishes of the cultivator. In this latter case there should be three cuttings put into each spot, six inches apart, to ensure the setting of one. When this is ascertained with certainty, the two weakest may be withdrawn, leaving the best of the three to grow. If the cuttings be of one eye each, they should be from the last year's growth, and a small piece of the branch, an inch long, should be left attached to the bud, and extending half an inch on each side of it. These should be planted two inches below the surface, with the bud uppermost, and a small stake placed by the side of them, that they may not be disturbed. If the cuttings are of several eyes, they should be laid in the ground sloping, leaving one eye level with, or only just above, the surface. They should be kept moist, but not wet, as this will rot them. A spot which receives the morning sun till eleven o'clock, and not afterwards, is the best for a nursery-bed for them; but, for permanency, they should be planted where they will receive the sun longest; and, in this case, they should be shaded at noon day until they have entirely put out. One bud only should be allowed to push from the cutting the first year; the plant should be kept free from weeds; the earth kept light around it, and as soon as the shoot has attained

strength enough to produce laterals, they should be rubbed out, and the shoot tied to a small stake, by which means it will gain firmness, and the admission of the sun and air to the shoot will prepare it to bear the frost of the fall, and prevent its imbibing the moisture which it would otherwise be subject to, when covered with earth in the winter. By the first of November the shoots may be cut down to two eyes, and by the middle of the month, if it be dry weather, they may be covered over with earth, forming a slope to cast off the wet and prevent the rains from penetrating—as the drier the plant is kept during the winter, in the better state it will be in the succeeding spring.

The 2d year.—The plants should not be uncovered in this climate till the middle of April. Those from the nursery should now be transplanted to the places where they are to remain; a shoot from each eye should be permitted to push, but as soon as you have ascertained which of the two will be the strongest and the best situated, you will preserve that, and rub out the other. The shoot preserved you will be careful to tie up to a small stake, as soon as it has length enough for this purpose, to prevent its being broken by the wind or other casualty. During the summer, the laterals from the four or five lowest buds must be rubbed out, and the shoot be carefully protected by being kept tied every eight or ten inches.

The next fall you may cut this shoot down to two buds, (not counting the one in the crotch of the plant between the old and new wood,) and cover over as before.

The 3d year.—You will allow shoots to push from both the eyes, and suffer them to grow, taking care of them as recommended above; but the bud in the crotch must be rubbed out. This year you must rub out the laterals from the five lowest buds, and nip in the other laterals to one eye, so that, if the plant grows luxuriantly, the sap may burst from the buds of the laterals, and not from those of the main branch, as it would do if the vine was dressed too close. Be careful to keep the branches tied up, that they may not be broken. In November, cut down the two branches as follows: the most feeble of the two, to two buds, to produce wood branches the succeeding season; and the strongest to three buds, for fruit branches, and cover them as usual.

The 4th year.—If you keep your vines properly dressed, you may have your first fruits without injury to your plants. After this, the system to be pursued must depend on the

strength of your vines, and this will depend on the goodness of the soil and the care you take of your plants. But, as a general rule, the following points must be attended to :—

1. The number and length of your fruit branches must always depend on the strength of your plant; the wood branches are always to be cut down to two eyes.

2. No more branches should be left on the vine than it can nourish well and abundantly; this will depend on its age, and the soil in which it grows.

3. The branches should be cut in alternately for wood and fruit branches, observing to cut for wood branches as low down on the plant as possible, so as to renew your wood near the bottom annually. No shoots should be permitted to grow from the old wood, unless wanted for this purpose.

4. No more shoots should be permitted to grow than can be laid in clear, and handsome, and without confusion, on the trellis, and so as to admit the sun and air freely among the branches.

5. The laterals should be rubbed out of the wood branches six or eight eyes high, and those that are permitted to remain should be pinched into one bud. The laterals on the fruit branches should be rubbed out from the insertion of the shoot to the uppermost fruit inclusive, and the others pinched in as above. If the shoots are *very* strong, the upper laterals may be allowed to grow, to take up a greater portion of the sap; but this should not be done unless there is danger of the eyes bursting in the main shoots. Be careful always to keep the shoots tied up near their top.

6. Never leave more than five good eyes on a fruit-bearing branch, unless your vine is confined to a narrow space, and you are obliged to preserve only two or three fruit branches; in this case the length of the branch must correspond to the nourishment it will receive from the plant. Select the roundest and fairest branches for fruit, and the lowest and most feeble for wood. The closer the buds are together, or the shorter the joints of the branch, the better they are for fruit; these may in general be cut to three, four, or five eyes, according to their strength. But in vineries covered with glass, where two fruit-bearing branches only are left on strong vines, twenty, thirty, and forty buds are sometimes left on fruit branches.

The foregoing rules will be sufficient for any one to build up a vineyard sufficiently large to supply himself his

friends, and the market, with grapes. But, to promote and forward their maturity and size, the following course may be pursued :—

The first of July you will be able to see the state of your fruit, which will be just formed. At this time select the highest fruit branches, and those which have the finest appearance of fruit upon them, and perform the following operation on the two years' old wood, from which these branches proceed, taking care not to cut below any of the wood branches.

Take a pruning knife with a smooth edge and hawk's bill, and pass it round the branch where the bark is clear from knots, cutting deep enough to reach the sap-wood of the plant; at a quarter or three eighths of an inch below the first cut make another, running parallel with the first; then make a perpendicular cut through this section of the bark the same depth, and you may take out the ring of bark clear from the branch. This will not prevent the sap rising into the upper part of the branch, but it will prevent its descending below this cut, by which means it will be retained in, and distributed throughout, the upper part of the branch, in a greater portion than it could otherwise be, and the branches and fruit will both increase in size much more than any of those that are not thus treated, and the maturity of the fruit will be advanced very much.

This has been denominated *girdling.* If the plant is very vigorous and the season very favourable, the wound will soon be closed, so that it may be necessary to open it a second time. This process does not injure the plant, as you only girdle the fruit-bearing branches, which you would in any case cut out at the fall pruning, to make room for the branches which you have been bringing forward to give you fruit the succeeding year. This may be kept up from year to year, and give you a succession of ripe fruit from the first of September to the close of the season. The fruit on those branches which are not girdled will ripen the latest, of course, but neither these, nor those which have been girdled, should be shortened, as is customary on vines not thus treated.

By this practice, which was first suggested in the Transactions of the Horticultural Society of London a few years since, and first brought into use in this country with success by the corresponding secretary of the Mass. Agr. Soc. I have raised grapes in the open air this year, the bunches of which weighed from eight to twenty-eight ounces, and the ber-

ries measuring from two to three inches in circumference. On one vine which I planted a few years since—*a cutting* in the spot where it now grows—I had seventy bunches of fine chasselas, weighing from eight to eighteen ounces each.

But the grape-vines have of late years been attacked by a small insect which makes its appearance first in June, but is most abundant in August. This insect, if left to increase, destroys the vegetating principle in the leaf, and the plant languishes, the fruit mildews, and the labour and care of the cultivator are lost. Some gentlemen have abandoned their vines in consequence of the depredations of this insect, and others, with great labour and expense of time, have attempted, but in vain, to destroy them with alkalies and tobacco-juice. This has, to be sure, operated to check them partially, but not effectually. To remedy this evil, you have only to make a small, light frame, twelve or fourteen feet long, in the form of a soldier's tent, but with hinges of leather where the top joins, so that this tent may be shut up or opened at the bottom to any width you may require, according to the height of your trellis. This light frame, which should be made of slats of boards from one to two inches broad, may be covered with an old sail, or some cheap glazed cotton cloth, which will stop the smoke, leaving cloth enough loose at each end to close over, and prevent the smoke from escaping when the tent is spread over the trellis.

A few tobacco-stalks, moistened and put on some coals in a pan, will be sufficient to smoke the vines thoroughly; and, as the tent is easily moved along the trellis on some small wheels, one man may, in a few hours, extirpate this enemy of the vineyard. Vines that are already attacked by this insect to any great degree should be smoked in June, July, and twice in August, or oftener, if you find the insect is not completely destroyed.

The insects are first seen on the under part of the leaf, without wings—very active, but easily destroyed if touched. They afterwards assume the winged state, when it is very difficult to get at them, as they fly off on the vines being touched. They are yellow, striped with brown across the back. The moment the smoke ascends, the winged insects quit the leaves, and fall to the ground dead or alive; the young ones perish, but the older ones will revive if not destroyed in their torpid state. To effect this, you have only to cover the ground under the tent with a piece of wet cloth before you begin to smoke, to which they adhere un-

til the tent is removed, and they are revived by the atmospheric air; to prevent which you will roll, or twist, the cloth each time that you remove the smoke-house, or tent, and replace it again each time before you smoke, by which means they will be effectually destroyed. This simple and cheap operation will keep your vines clear of this troublesome and destructive insect, and you may, if the season be warm, ensure a good harvest; if otherwise, you will be sure, if the vines be girdled, to ripen a portion of your fruit, at least.

CALENDARIAL INDEX.

THE object of this Calendar is little more than to give brief intimations of work to be performed in a garden, together with some approximation to the time of year in which it should be accomplished. The figures refer to the pages in which further directions may be found relative to the operations adverted to. These directions are intended for the New England States, or about the latitude 42° N. and the vicinity, or a small elevation above the sea.

Allowance should be made for elevation of site, as well as for situation north or south of that degree. But it is not possible, perhaps, to state what that allowance should be with any approach to precision. The nature of the soil, the aspect, the exposure, the forwardness or backwardness, or what may be styled the general character of the season, are all to be regarded; and require the exercise of a sound discretion in the cultivator, not to be restricted by general rules, which are not liable to too many exceptions to be noted in this work.

JANUARY.

Throughout New England the temperature of the climate is such as to exclude the cultivator from performing most of the operations of tillage or horticulture from about the first of December to the latter part of March, or the beginning of April. The seeds of knowledge may, however, be sown in winter, and the horticulturist may cultivate his mind when his soil is bound in frozen fetters.

Provide a sufficient quantity of bean-poles, and pea-rods, which you may preserve in a corner of your wood-house, or other place suitable for your purpose. Many people, who neglect to procure these implements in season, are induced, by the hurry of business, to permit their peas and beans to trail on the ground, in which situation they will not produce, especially the tall growing sorts, one third part so many as if they were properly supported by poles and rods. The length of your pea-rods should be in proportion to the sorts of peas for which you intend them, 229. The same kinds of rods, which the tall-growing peas require, will answer for the generality of running kidney beans. The Lima beans will need strong poles, from eight to nine feet high. You may now make preparation for forcing cucumbers and melons, 84, 202.

FEBRUARY.

Manure may be carried into those places where it is needed, left in a heap, but not spread. Wherever and whenever the snow is off the ground, rake together and burn the haulm, or whatever may remain from the last year's crop. Fences should be inspected and repaired, and seed rubbed out and cleaned. Straw mats for the hot-beds, pales, rails, lattices, or trellises for espalier trees, should be got in readiness, 107. See that your garden tools are in good repair, and procure such new ones as may be necessary. It is now time to set about procuring and preparing materials for, and forming hot-beds, 161. Clean trees from moss, and protect them against mice and rabbits by whitewashing with lime, or smearing with some composition which is offensive to those vermin. Enter in earnest into the business of forwarding various kinds of seedling plants, by artificial means, so that they may have strong roots, and arrive at some size

by the time they would naturally make their first appearance above ground. This may well be done by adopting Mr. Armstrong's method, with regard to melons, 202. Attend to your fruit in your fruit-room or cellar, on shelves or in boxes, and, if necessary, pick it over, and cull out whatever is defective; wipe the remainder dry, and pack it away anew. But if it is put down in some sort of grain, dry sand, flax-seed chaff, or, what is probably best of all, pulverized plaster of Paris, you will not need to meddle with it. You may now, perhaps, begin to force asparagus in hot-beds, 28. Sow under glass cases, for transplanting or otherwise, radishes, carrots, small salads, peas, beans, &c. Protect choice plants, which may show a disposition to vegetate, by matting, litter, cases of wicker, old bark, and other proper means.

MARCH.

Lettuce may be sowed in the open ground as soon as frost will permit, 191. It may be sowed between vacant rows, intended for other plants, and pulled out for use before the other plants are large enough to be encumbered by it. Early peas cannot be planted too soon after the ground is thawed, 226. Radishes may be sowed as soon as the seeds can be raked in. Sow cabbages, cucumbers, melons, cauliflowers, squashes, &c. in hot-beds, under glasses, &c., 84, 149, 202. Dig up vacant ground, applying manure. Dress borders, and clip edgings of box. Clean, relay, or make new gravel walks. Attend to, and turn over compost beds. Dress asparagus beds, or make new ones the latter part of this month or the beginning of April, 22. Select from your cellar the best cabbages with heads, and set them in some proper place to stand for seed. Set the different kinds remote from each other, to prevent their mixing at the time of blossoming. Likewise, set some of your best cabbage stumps for early salad and greens. If the ground is moist, set shallow; if dry, place them about six inches deep. Small salading, such as cresses, 80, 81, mustard, 207, 208, radish, 260, &c., when a constant supply is wanted, should be sown once a week or fortnight. Celery, for an early crop, may be sown in this month, though the principal sowing had better be deferred till April, 74. Artichokes should be sowed as early as the season will permit, 18, and horse-radish, 159.

APRIL.

In the Eastern States, generally, and in those parts of the Middle States where the ground is naturally somewhat moist and heavy, this is the month for sowing the principal garden crops. Sow the hardy kinds as soil, site and season will permit, that the plants may be firmly established before they are overtaken by the heat and drought of summer. But a stiff and moist soil should never, on any account, be dug, ploughed or harrowed when it is so wet as to be clammy and adhesive. On the other hand, a light, sandy soil will be meliorated by being hoed, or otherwise wrought on while moist.

"Earth of a consistence that will hold water longest *without becoming hard when dry*, is that of all others the best adapted for raising the generality of plants in the greatest perfection. The great art of improving sandy and clay soils is to give to the former such dressings of clay, cow-dung, and other kinds of manure, as will have a tendency to bind and make it more compact, and, consequently, more retentive of moisture; and, to the latter, coats of sandy earth, pond mud, horse dung," &c.—*M'Mahon.*

Sow artichokes, 18, asparagus, 22, horse, or garden beans, 33, kidney beans, 36, beets, 40, the last of this month, or the first of next, borecole, 51, Brussels sprouts, 55; sow cabbage seed, 60, set out cabbage plants, 61, sow cardoons, 67, carrots, 68, cauliflowers, 72, celery, 74, coleworts, 79, succession-crops of cresses, 80, 81, cucumbers in hollowed turnips placed in a hot-bed, 87, or in pots under hand-glasses, &c.; propagate fruit-trees by cuttings, 95. You may set out a few dandelion plants in your garden, 97, and let us know how you succeed in attempting to domesticate them. Look out for, and destroy insects, 169; sow a little early summer endive, 105, fennel, 108; propagate garlic, 136, leeks, 190

MAY.

You may now sow most or all the articles mentioned in the Calendar for the last month, either as first or succession-crops. Plant your cucumbers, 82, and melons, 198, for a general crop in the open ground about the 20th; also, squashes, pumpkins, and gourds; likewise, Indian corn for an early garden crop, 164. Plant your bush-beans and pole-beans, for your principal crop, at any time when most convenient during the month, 36. It is recommended to set the poles, and then plant the beans round the poles. Weed and thin your advancing crops of radishes, 261. Transplant radishes for seed, 262. Sow succession-crops of spinach, 282. Carrots may be sown in the Eastern States in the forepart of the month, 68. Weed and thin beets, carrots, parsneps, onions, early turnips. Sow more turnips of the early kinds for crops in succession. Such sowing is best performed in the first week of the month, in order that the roots may have time to grow to a good size before they are overtaken by summer heat and drought. Early cauliflower plants, as they advance in growth, should have earth drawn up about their stems, and be watered in dry weather. You will do well to sow peas for succession-crops, at least twice this month, 226. You may set out or transplant early lettuce. Sow as many of the sorts of small salading as you may need for market or family consumption. Now is, perhaps, as proper a time as any in the year for pruning fruit-trees, 257. The season for pruning is immediately before, or commensurate with, the rising of the sap. Let your ducks have constant employment as *vermin pickers*, 102. Attack insects by sprinkling over them, by means of a syringe, watering-pot, or garden engine, simple water, soap-suds, decoctions of tobacco, of elder, &c. &c. 169.

JUNE.

Melons and cucumbers, which have hitherto been protected by glasses or paper frames, may now be exposed to the open air. If the season be at all dry, your vegetables, particularly your cucumbers, will need water. [See Introduction.] Keep your crops clean, by hand-weeding and hoeing, as directed page 158. About the last of the month, you may sow crops of melons and cucumbers for pickling. Thin forward melon plants, leaving only two or three in a hill, 201. Attend to your cabbage and cauliflower plants, as well as your beans, &c. and see that they are not destroyed by the cut worm. "If you perceive any plants injured, open the earth at the foot of the plant, and you will never fail to find the worm at the root, within four inches. Kill him, and you will save not only the other plants of your garden, but probably many thousands in future years." Hoe and bush your late peas; plant more potatoes, succession-crops of kidney beans, 36, peas, 226, small salads and lettuce every week or ten days. "Thin out and earth up all your plants; remember that frequent hoeing is both rain and manure to your vegetables in dry weather." Celery plants may now be planted out in trenches, 74. When the plants have grown to the height of eight or ten inches, draw earth about them, breaking it fine. This should be done in dry weather, being careful not to bury the heart. Plant out cabbages, cauliflowers, broccoli, &c. in moist or cloudy weather, but not when the ground is wet and heavy, 61. Cut and dry such herbs as have come to maturity, for winter use. You may as well dry and pulverize some kinds, as directed p. 205. Look over your grafted trees, and you may ascertain whether the scion has united with the stock. Take off the clay, and loosen the bandages of such grafts as have succeeded, and tie weak grafts and dangling shoots from budded stocks to neat stakes. Rub off all superfluous, irregular, or ill placed shoots or suckers. Where your fruit-trees appear to be overloaded with fruit, pick off a part, and carefully gather all that which has fallen and give to your swine, in order to destroy the curculio, 176.

JULY.

Clean and prepare your ground where your early crops of peas, spinage cauliflowers, and cabbages grow, and all other vacant spots, to cultivate thereon such plants as are proper to supply your table, in autumn and winter, with later-grown productions. You may continue to sow crops of small salading every eight or ten days, as directed in former months; but they should now be sown on shady borders, or else be shaded by mats, occasionally, from the mid-day sun, and frequently watered, both before and after the plants appear above ground. You may now plant ont your celery plants in trenches, 74, unless you have already performed that operation, as directed last month. About the middle of July, and from that time to the end of the first week in August, you may sow turnips, 292. Thin and transplant such lettuces as were sown last month, and sow more lettuce-seed in the beginning, middle, and last week of this month, in order to have a constant supply for the table, 191. Sow likewise radishes, 261, and in the last week of this month a good crop of spinach may be sown for autumn use; it will not then be so liable to run to seed as in the preceding months. It is a good practice to sow early kinds of cabbages, 60, about this time, for a supply of young greens during autumn. Collect all kinds of seeds as they come to maturity, cutting off or pulling up the stems with the seeds attached, as they ripen. Spread them in some airy place under cover, turning them now and then, that the seeds may dry and harden gradually, and be careful not to lay them so thick as to hazard their heating and fermenting. When they are sufficiently dry, beat out and clean the seeds, and deposit them in bags or boxes till wanted. Give water to such plants as require it, but let this be always done in the evening, that it may be of use to the vegetables before the sun shall cause it to evaporate.

You may now inoculate or bud your fruit-trees, 165, and, where it can be done without inconvenience, it will be well to turn swine into your orchard to eat the fallen and decayed fruit, and thus destroy the insects which it contains. If, however, this cannot well be done, or you have not swine in sufficient numbers to devour all your fallen fruit, it will be well to gather and carry it from the ground before the insects, which inhabit it, make their way into the earth, and make you destructive visitations another season.

AUGUST.

Keep all your crops clear from weeds, using the hoe where safe and convenient; otherwise make claw-hoes of your hands, and weed-extracting nippers of your thumb and fore-fingers. Pull up the haulm of peas, beans, &c., and remove it to your compost bed; bury it between rows of plants, or throw it, together with all weeds, &c. to your swine, that your premises may have a neat appearance. Cut such herbs as are now in flower, to distil, or to dry for winter use, being careful to do it when they are dry, and spread them in a dry, shady place; for, if they are dried in the sun, they will shrink very much, turn black, and prove of little value. Your dung-hills and compost-heaps should, during the summer months, be kept free from weeds; for if the seeds are permitted to ripen and fall, the dung, when carried into the garden, will disseminate weeds innumerable. Attend to plants set out for seed, and put stakes to such as need support. This month, as well as the latter part of July, is the proper season for inoculating or budding, 165. M'Mahon says, "Cherries, plums, or any other fruit-trees, may be budded in August, if the bark parts freely from the stock. Pears ought to be inoculated the early part of the month, or while the sap flows freely; but the peach, nectarine, almond, and apple, will succeed any time between the first of August and twentieth of September, provided the stocks are young and vigorous."

Preserve peach, plum, cherry, and apricot stones, &c. to sow for raising stocks to bud and graft on. These may either be sown immediately, or kept in common garden earth or moist sand. But it will be necessary to sow them before the stones open, and the radicles begin to shoot; otherwise many of them will be broken or torn in the process of sowing. Every day they are kept out

of ground is an injury to them; and if they remain in a dry state till spring, very few will vegetate till a year after, and the greater number not at all. Continue to collect and preserve seeds as directed last month. Sow onions to stand over winter, 218; likewise, cauliflowers, 72.

SEPTEMBER.

Hoe and thin your growing crops of spinach, 283. In the first week of this month, sow a full crop of the prickly-seeded kind for winter and spring use, 283. And, at the same time, you should sow a good supply of the early short-top, white and red turnip-rooted and salmon radishes, 260. Earth up celery as it advances in growth, but be careful to avoid covering the hearts of the plants. This work should be done in a dry day. See that you do not bruise or injure the stalks; for if they are crushed or wounded, they will be subject to rot, 75. Gather all kinds of seeds as they ripen, which may be necessary for the ensuing season. Towards the latter end of the month, you may safely transplant all kinds of hardy perennial, aromatic, and medicinal herbs, which will thus become well rooted before winter. This work should, if possible, be done in moist weather. Pull and preserve your ripe onions, 219, and sow more to stand over winter, 218. Protect your grapes and other fruit against wasps. This may be done by hanging up phials of honied or sugared water near the fruit you wish to defend from their attacks, in which many of the tiny depredators will be caught and destroyed. Thoroughly clean from weeds all the seed-beds and young plantations of trees, shrubs, &c. Gather cucumbers and mangoes for pickling before they spot. Sow cauliflowers about the 20th, 72.

OCTOBER.

The young cabbage plants, produced from seeds sown last month, and intended for early summer cabbages, should be transplanted into the beds in which they are to remain during winter, 60.

Prepare a bed for them, the width of your garden frame, in a warm, well-sheltered place, where the sun has the greatest power; yet be careful never to admit the direct sunshine on the plants, when in a frozen state. When you have no glasses, the plants may be protected during winter by boards or mats, giving them air in mild weather. Cauliflowers sown in August or September should be raised carefully, and protected, during the cold season, in garden frames, with boards, mats, &c., or perhaps some may survive if set in open borders, 72, or they may be set in pots, 73. Weed and thin your late crops of spinach, leaving the best plants at the distance of three, four, or five inches asunder, 283. Early in the month, hoe and earth up the late-planted crops of cabbages, broccoli, and borecole, cauliflowers and other plants of the brassica genus. Towards the end of the month, if the stalks of asparagus turn yellow, cut them close to the earth; clear the beds and alleys from weeds, and carry them with the stalks off the ground. It will then not be amiss to cover the beds and alleys with old litter, well trodden down, to be removed in the spring. Or you may apply manure now, instead of in spring, as directed page 25. Cut down all decayed flower stems, and shoots of the various kinds of aromatic, pot and medicinal herbs, close to the plants; clear the beds from weeds and litter, and carry the whole off the ground. Onions may now be planted out to raise seed, instead of setting them in the spring, as directed p. 219. The seeds of dill, skirret, rhubarb, sea-kale, may now be sown; for, if kept out of ground till spring, many of them will not vegetate till a year after; but when sown in October or November, if the seeds are fresh and perfect, they will vegetate in the April following. Begin to take up and secure potatoes, 255, beets, 49, carrots, parsneps, turnips, Jerusalem artichoke, &c., 50. Give a general hoeing and weeding to all your crops, and carry the weeds out of the garden. Such spaces of ground as are now vacant should be dunged, dug, or trenched, and thus have the advantage of a winter fallow, and that exposure to frost, which will reduce it to fine tilth, and destroy worms, the larvæ of insects, &c. The old beds of strawberries should, some time in this month, be

cleaned from weeds, and the vines or runners taken off close to the plants. Then, if there be room, loosen the earth to a moderate depth between the plants, taking care not to disturb the roots. And if the plants are in beds with alleys between, line out the alleys, and let them be dug a moderate depth, breaking the earth very fine, and spreading a sufficiency of it over the beds, between and round the beds, taking care not to bury their tops. A slight top dressing of compost, such as described p. 286, may now be applied. It may now be time to gather and preserve apples and pears, 13, though it is best to let them remain on the trees as long as they are safe from frost, 15. If you are not apprehensive of the depredations of mice, rats, squirrels, &c. you may sow the stones of plums, peaches, nectarines, apricots, &c.; or you may, if you think it more prudent, preserve them in sand till March or April.

NOVEMBER.

Gather from your garden, before the hard frosts commence, all those fruits of your labours, which you wish to preserve through the winter, not forgetting winter squashes. Take up and preserve cabbages, as directed p. 65. Preserve your celery, 75. You may gather a part in dry weather, and pack it in boxes in dry sand, and place the boxes in a warm cellar, leaving the tops and leaves open to the air. Those cabbage and cauliflower plants, which you mean shall stand through the winter in frames, should, during the continuance of mild weather be allowed every advantage of free air, to inure them, by degrees, to bear cold. Take the glasses off entirely, in the warm part of the day, but place them on again at night, and in wet or cold weather. If your beets, turnips, parsneps, &c. are not secured, take them up, and preserve them, as directed last month. You may now sow the seeds of rhubarb, sea-kale, skirrets, parsneps, and many other kinds, which are somewhat slow in vegetating, and they will come forward early, and grow vigorously in the spring. In the beginning of this month, you may manure and trench the ground which is intended for early crops, and, if it be of a stiff, heavy nature, lay it up in ridges, to receive the benefit of the winter frosts. You may now sow early peas, to come up in the spring, if you can preserve them against mice, 227. This is, perhaps, as eligible a period as any for the planting of apple-trees, and other fruit-trees, 17, 220, or sowing seeds in a nursery, 208, 210. Lay light litter of some kind a good thickness over the roots of the more tender and choice kinds of trees and shrubs, to protect them from frost.

DECEMBER.

The severity of the weather in this month generally allows but little to be done in the Middle and Northern States. Should the season permit, you may perform any of the operations directed for last month, which remain unfinished. If the weather continues open, carry out and spread manure, and trench the ground, as directed for the last month. Provide from the woods, &c. pea-sticks and bean-poles, of suitable lengths and sizes, as directed in January. Collect all your old sticks and poles, which are still fit for use, and place them together with your new ones under cover, to prevent their rotting. Be careful to shut the frost out of the apartments in which you have stored your fruit for winter and spring use. Examine the fruit which you have on shelves in cellars, once every ten days, and take away any that you find tainted. Repair all decayed trellises, espaliers, &c. Procure stakes and other materials which may be wanted in a more busy season.

POTATOES—The following letter from a Vermont farmer, addressed to Governor Bigler, makes some suggestions in regard to the cultivation of potatoes, that may be worthy of a trial. We had before heard of the advantage of covering potatoes with leaves, but never made the experiment:

East Poultney, March 8th, 1852.

To the Gov of the State of Pennsylvania:

I, Abner Lewis, of Poultney county, of Rutland, and State of Vermont think I have found out a new way of raising potatoes, to keep them from *rotting* or *rusting*, of a much better quality and abundant crop. Plow and harrow the ground, and furrow lightly; *plant early;* drop the potatoes in the furrow, and put on each hill a handful of *leaves*; then cover lightly with dirt; hoe them quite small; then plaster; and they will soon be fit for hilling.

Please try the above to your full satisfaction, and publish the same throughout the State. If the above proves a real public benefit, the State will please reward the undersigned whatever they see fit. Yours Respectfully,

ABNER LEWIS.