

Soil Culture

J. H. Walden

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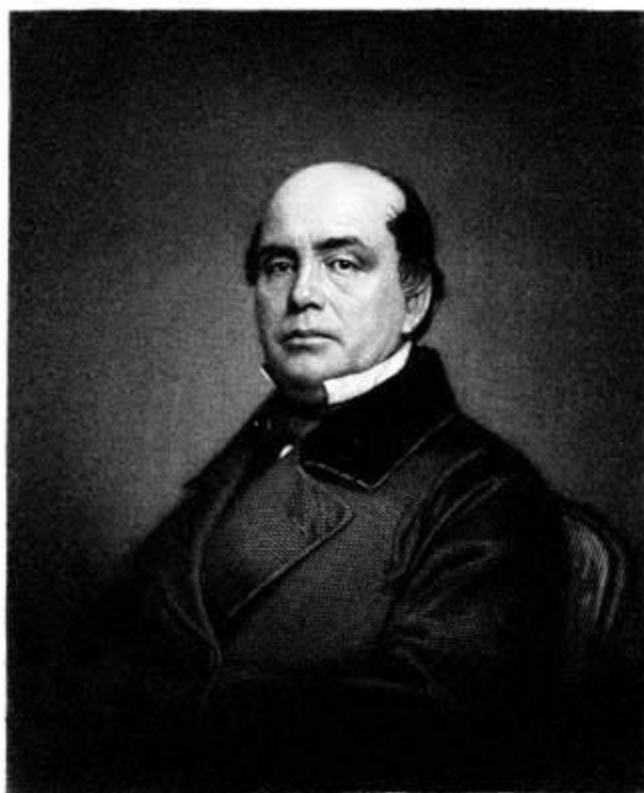
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*** START OF THE PROJECT GUTENBERG EBOOK SOIL CULTURE



Yours ever truly
J. H. Walden

SOIL CULTURE;

**CONTAINING
A COMPREHENSIVE VIEW
OF
AGRICULTURE, HORTICULTURE, POMOLOGY,
DOMESTIC ANIMALS, RURAL ECONOMY,
AND AGRICULTURAL LITERATURE.**

BY

J. H. WALDEN, A. M.

ILLUSTRATED BY NUMEROUS ENGRAVINGS

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TO
THE PRACTICAL CULTIVATORS OF THE
SOIL,

**The True Lords of the Manor,
THIS VOLUME IS DEDICATED,
BY THEIR SINCERE FRIEND,**

THE AUTHOR.



PREFATORY NOTE TO THE READER.

If "he who causes two blades of grass to grow where but one grew before, is a benefactor of his race," he is not less so who imparts to millions a knowledge of the methods by which it is done.

The last half century has been the era of experiments and writing on the cultivation of the soil. The result has been the acquisition of more knowledge on the subjects embraced, than the world had attained in all its previous history. That knowledge is scattered through many volumes of numerous periodicals and books, and interspersed with many theories, and much speculation, that can never be valuable in practice. In the form in which it is presented, it confuses, rather than aids, the great mass of cultivators. Hence the prejudice against "*book-farming*." Provided established facts only are presented, they are none the worse for being printed.

The object of this volume is to condense, and present in an intelligible form, all important established facts in the science of soil-culture. The author claims originality, as to the discovery of facts and principles, in but few cases. During ten years of preparatory study for this work, he has sought the rewards of industry, in sifting out the certain and the useful from the hypothetical and the fanciful, and the results of judicious discrimination between fallacy and just reasoning, in support of theories. This volume is designed to be a complete manual for all but amateur cultivators. While it is believed that he who follows its directions will be certain of success, it is not intended to disparage the merits of other works, but to encourage and extend their perusal. We can not too strongly recommend to young culturists to keep themselves well posted in this kind of literature, and give to every discovery and invention in this science a fair trial; not on a large scale, so as to sink money in fruitless experiments, but sufficient to afford a sure test of their real value. To no class of men is study more important than to soil-culturists.

It is believed that the directions here given, if followed, will save millions of dollars annually to that class of cultivators who can least afford to waste time and money in experimenting. With beginners it is important to be successful

at first; which is impossible without availing themselves of the experience of others. While we thus aim to give our volume this exclusively practical form, and utilitarian character, we do not undervalue the labors of amateur cultivators. A meed of praise is due to those who are willing to spend time and money in experiments, by which great truths are evolved for the benefit of mankind.

Perfection is not claimed for this volume. But the author hopes nothing will be found here that is untrue. A fear of inserting errors may have induced us to omit some things that may yet prove valuable. If anything seems to be at variance with a cultivator's observation, in a given locality, he will discover in our general principles on climate, soil, and location, that it is a natural result.

Accurate as far as we go has been our motto. It is hoped the form is most convenient. All is arranged under one alphabet, with a complete index. The author has consulted many intelligent cultivators and writers, who, without exception, approve his plan. All agree in saying that it is designed to fill a place not occupied by any other single volume in the language. It is impossible, without cumbering the volume, to give suitable credit to the authors and persons consulted. Suffice it to say, the author has carefully studied all the works mentioned in this volume, and availed himself of a great variety of verbal suggestions, by scientific and practical men. If this work shall, in any good degree, serve the purpose for which it is intended, it will amply reward the author for an amount of labor, experiment, observation, and study, appreciable only by few.

J. H. WALDEN.

NEW YORK, *January 1, 1858.*



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SOIL CULTURE.

ACCLIMATION.

This is the art of successfully changing fruits or plants from one climate to another. Removal to a colder climate should be effected in the spring, and to a warmer one in the fall. This may be done by scions or seeds. By seeds is better, in all cases in which they will produce the same varieties. Very few imported apple or pear trees are valuable in this country; while our finest varieties, perfectly adapted to our climate, were raised from seeds of foreign fruits and their descendants. The same is true of the extremes of this country. Baldwin apple-trees, forty or fifty years old, are perfectly hardy in the colder parts of New England; while the same imported from warmer sections of the Union fail in severe winters. This fact has given many new localities the reputation of being poor fruit-regions. When we remove fruit-trees to a similar climate in a new country, they flourish well, and we call it a good fruit-country. Remove trees from the same nursery to a different climate and soil, and they are not hardy and vigorous, and we call it a poor fruit-country. These two localities may be equally good for fruit, with suitable care in acclimating the tree and preparing the soil. Thus the rich prairies of central Illinois are often said not to be adapted to fruit. Give time to raise fruits from the seed, and to apply the principles of acclimation, and those rich prairies will be among the great fruit-growing regions of the world. Two things are essential to successful fruit-culture, on all the alluvial soils of the Northwest: raise from seed, and prune closely and head-in short, and thus put back and strengthen the trees for the first ten years, and no more complaints will be heard.

The peach has been gradually acclimated, until, transplanted from perpetual

summer, it successfully endures a temperature of thirty-five degrees below zero. This prince of fruits will yet be successfully grown even beyond the northern limits of Minnesota. Many vegetables may also be grown in very different climates, by annually importing the seed from localities where they naturally flourish. Sweet potatoes are thus grown abundantly in Massachusetts. We wonder this subject has received so little attention. We commend these brief hints to the earnest consideration of all practical cultivators, hoping they may be of great value in the results to which they may lead.

ALMONDS.

Almonds are natives of several parts of Asia and Africa. They perfectly resemble the peach in all but the fruit. The peach and almond grow well, budded into each other. In France, almond-stocks are preferred for the peach. Their cultivation and propagation are in all respects the same as the peach.

Varieties.—1. Long, hard shell. This is the best for cultivation in western and middle states, and in all cold regions. Very ornamental.

2. Common sweet. Productive in middle states, but not so good as the first.

3. Ladies' thin shell. Fruit large, long, and sweet; the very best variety, but not so hardy as the first two. Grows well in warm locations, with slight protection in winter.

4. The bitter. Large, with very ornamental leaves and blossoms. Fruit bitter, and yielding that deadly poison, prussic acid.

5. Peach almond. So called from having a pulp equal to a poor peach. Not hardy in northern climates. Other varieties are named, but are of no consequence to the practical cultivator.

6. Two varieties of ornamental almonds are very beautiful in spring—the large, double flowering, and the well-known dwarf flowering. But we regard peach-blossoms quite as ornamental, and the ripe peaches much more so, and so prefer to cultivate them.

Almonds are extensively cultivated in the south of Europe, especially in

Portugal, as an article of commerce. They will grow equally well in this country; but labor is so cheap in Europe, that American cultivators can not compete with it in the almond market. But every one owning land should cultivate a few as a family luxury.

APPLES.

The original of all our apples was the wild European crab. We have in this country several native crabs larger and better than the European; but they have not yet, as we are aware, been developed into fine apples. Apple-trees are hardy and long-lived, doing well for one hundred and fifty years. Highly-cultivated trees, however, are thought to last only about fifty years. An apple-tree, imported from England, produced fruit in Connecticut at the age of two hundred and eight years. The apple is the most valuable of all fruits. The peach, the best pears, the strawberries, and others, are all delicious in their day; but apples are adapted to a greater variety of uses, and are in perfection all the year; the earliest may be used in June, and the latest may be kept until that time next year. As an article of food, they are very valuable on account of both their nutritive and medicinal qualities. As a gentle laxative, they are invaluable for children, who should always be allowed to eat ripe apples as they please, when they can be afforded. Children will not long be inclined to eat ripe fruit to their injury.

An almost exclusive diet of baked sweet apples and milk is recorded as having cured chronic cases of consumption, and other diseases caused by too rich food. Let dyspeptics vary the mode of preparing and using an apple diet, until it agrees with them, and many aggravated cases may be cured without medicine. It is strange how the idea has gained so much currency that apples, although a pleasant luxury, are not sufficiently nutritious for a valuable article of diet. There is no other fruit or vegetable in general use that contains such a proportion of nutriment. It has been ascertained in Germany, by a long course of experiments, that men will perform more labor, endure more fatigue, and be more healthy, on an apple diet, than on that universal indispensable for the poor, the potato. Apples are more valuable than potatoes for food. They are equally valuable as food for fowls, swine, sheep, cattle, and horses. Hogs have been well fattened on apples alone. Cooked with other vegetables, and mixed with a little ground grain or bran, they are an economical food for

fattening pork or beef. Sweet or slightly-acid apples, fed to neat stock or horses, will prevent disease, and keep the animals in fine condition. For human food they may be cooked in a greater variety of ways than almost any other article. Apple-cider is valuable for some uses. It makes the best vinegar in general use, and, when well made and bottled, is better than most of our wines for invalids. Apple-molasses, or boiled cider, which is sweet-apple cider boiled down until it will not ferment, is excellent in cookery. Apple-butter is highly esteemed in many families. Dried apples are an important article of commerce. Green apples are also exported to most parts of the world. Notwithstanding the increased attention to their cultivation during the last half-century, their market value is steadily increasing, and doubtless will be, for the best varieties, for the next five hundred years.

It does not cost more than five or six cents per bushel to raise apples; hence they are one of the most profitable crops a farmer can raise. No farm, therefore, is complete without a good orchard. The man who owns but five acres of land should have at least two acres in fruit-trees.

Soil.—Apples will succeed well on any soil that will produce good cabbages, potatoes, or Indian corn. Land needs as much manure and care for apple-trees as for potatoes. Rough hillsides and broken lands, unsuitable for general cultivation, may be made very valuable in orchards. It must be enriched, if not originally so, and kept clean about the trees. On no crop does good culture pay better. Many suppose that an apple-tree, being a great grower, will take care of itself after having attained a moderate size. Whoever observes the great and rapid growth of apple-trees must see, that, when the ground is nearly covered with them, they must make a great draft on the soil. To secure health and increased value, the deficiency must be supplied in manure and cultivation. The quantity and quality of the fruit depend mainly on the condition of the land. The kinds and proportions of manures best for an apple-orchard are important practical questions. We give a chemical analysis of the ashes of the apple-tree, which will indicate, even to the unlearned, the manure that will probably be needed:—

Analysis of the ash of the apple-tree.

Sap- wood.	Heart- wood.	Bark of trunk.
---------------	-----------------	-------------------

Potash	16.19	6.620	4.930
Soda	3.11	7.935	3.285
Chloride of sodium	0.42	0.210	0.540
Sulphate of lime	0.05	0.526	0.637
Phosphate of peroxyde of iron	0.80	0.500	0.375
Phosphate of lime	17.50	5.210	2.425
Phosphate of magnesia	0.20	0.190	
Carbonic acid	29.10	36.275	44.830
Lime	18.63	37.019	51.578
Magnesia	8.40	6.900	0.150
Silicia	0.85	0.400	0.200
Soluble silicia	0.80	0.300	0.400
Organic matter	4.60	2.450	2.100
	———	———	———
	100.65	104.535	111.450

This table will indicate the application of plenty of wood-ashes and charcoal; lime in hair, bones, horn-shavings, old plaster, common lime, and a little common salt. Lime and ashes, or dissolved potash, are indispensable on an old orchard; they will improve the fruit one half, both in quantity and quality.

Propagation.—This is done mainly by seeds, budding and grafting. The best method is by common cleft-grafting on all stocks large enough, and by whip or tongue grafting on all others. (See under article, Grafting.)

Grafting into the sycamore is recommended by some. The scions are said to grow profusely, and to bear early and abundantly; but they are apt to be killed by cold winters. We do not recommend it. Almost everything does best budded or grafted into vigorous stocks of its own nature. Root-grafting, as it is termed,—that is, cutting up roots into pieces three or four inches long, and putting a scion into each—has been a matter of much discussion and diversity of opinion. It is certainly a means of most rapidly multiplying a given variety, and is therefore profitable to the nurseryman. For ourselves, we should prefer trees grafted just above, or at the ground, using the whole stock for one tree. We do not, however, undertake to settle this controverted point. Our minds are fixed against it. Others must do as they please. Propagation by seed is

thought to be entirely uncertain, because, as is supposed, the seeds will not reproduce their own varieties. We consider this far from being an established fact.

When grafts are put into large trees, high up from the ground, their fruit may be somewhat modified by the stock. There is also a slight tendency in the seeds of all grafts to return to the varieties from which they descended. But we believe the general rule to be, that the seeds of grafts, put in at the ground and standing alone, will generally produce the same varieties of fruit. The most prominent obstacle in the way of this reproduction is the presence of other varieties, which mix in the blossom. The planting of seeds from any mixed orchard can never settle this question, because they are never pure. Propagation by seeds, then, is an inconvenient method, only to be resorted to for purposes of acclimation. But it is so seldom we have a good bearing apple-tree so far removed from others as not to be affected by the blossoms, that we generally get from seeds a modification of varieties. Raising suitable stocks for grafting is done by planting seeds in drills thirty inches apart, and keeping clear of weeds until they are large enough to graft. The soil should be made very rich, to save time in their growth. Land where root-crops grew the previous year is the best. If kept clear of weeds, on rich, deep soil, from one to two thirds of them will be large enough for whip-grafting after the first year's growth. The pomice from the cider-mill is often planted. It is better to separate the seeds, and plant them with a seed-drill. They will then be in straight, narrow rows, allowing the cultivator and hoe to pass close by them, and thus save two thirds of the cost of cultivation. The question of keeping seeds dry or moist until planting is one of some importance. Most seeds are better for being kept slightly moist until planted; but with the apple it makes no difference. Keep apple-seeds dry and spread, as they are apt to heat. Freezing them is not of the slightest importance. If you plant pomice, put in a little lime or ashes to counteract the acid. For winter-grafting, pull the seedlings that are of suitable size, cut off the tops eight inches from the root, and pack in moist sand in a cellar that will not freeze. After grafting, tie them up in bunches, and pack in tight boxes of moist sand or sawdust.

Transplanting.—This is fully treated elsewhere in this work. We give under each fruit only what is peculiar to that species. In mild climates transplant in the fall, and in cold in the spring. Spring-planting must never be done until the soil has become dry enough to be made fine. A thoroughly-pulverized soil

is the great essential of successful transplanting. Trees for spring-planting should always be taken up before the commencement of vegetation. But in very wet springs, this occurs before the ground becomes sufficiently dry; it is then best to take up the trees and heel them in, and keep them until the soil is suitable. The place for an apple-tree should be made larger than for any other tree, because its roots are wide-spreading, like its branches. The earth should be thrown out to the depth of twenty inches, and four or five feet square, for an ordinary-sized tree. This, however, will not do on a heavy clay subsoil, for it would form a basin to hold water and injure the tree. A ditch, as low as the bottom of the holes, should extend from tree to tree, and running out of the orchard, constructed in the usual method of drains, and, whatever be the subsoil, the trees will flourish. The usual compost to manure the trees in transplanting will be found elsewhere. In the bottom of these places for apple-trees should be thrown a plenty of cobblestones, with a few sods, and a little decaying wood and coarse manure. We know of nothing so good under an apple-tree as small stones; the tree will always be the larger and thriftier for it. This is, in a degree, beneficial to other fruits, but peculiarly so to the apple.

Size for transplanting.—Small trees usually do best. Large trees are often transplanted with the hope of having an abundance of fruit earlier. This usually defeats the object. The large trees will bear a little fruit earlier than the small ones; but the injury by removal is so much greater, that the small stocky trees come into full, regular bearing much the soonest. From five to eight feet high is often most convenient for field-orchard culture. But, wherever we can take care of them, it is better to set out smaller trees; they will do better for years. A suitable drain, extending through the orchard, under each row of trees, will make a good orchard on low, wet land.

Trimming at the time of transplanting.—Injured roots should be removed as in the general directions under Transplanting. But the idea of cutting off most of the top is a very serious error. When large trees are transplanted, which must necessarily lose many of their roots in removal, a corresponding portion of the top must be separated; but in no other case. The leaves are the lungs of the tree. How shall it have vitality if most of them are removed? It is like destroying one lung and half of the other, and then expect a man to be in vigorous health. We have often seen the most of two years' growth of trees lost by such reckless pruning. If the roots are tolerably whole and sound,

leave the top so. A peach-tree needs to be trimmed much closer when transplanted, because it has so many more buds to throw out leaves.

Mulching.—This is quite as beneficial to apple-trees as to all transplanted trees. Well done, it preserves a regularity of moisture that almost insures the life of the tree.

Pruning.—The tops should be kept open and exposed to the sun, the cross limbs cut out, and everything removed that shows decided symptoms of decay. The productiveness of apple-trees depends very much upon pruning very sparingly and judiciously. There are two ways to keep an open top: one is, to allow many large limbs to grow, and cut out most of the small ones, thus leaving a large collection of bare poles without anything on which the fruit can grow;—the other method is to allow few limbs to grow large, and keep them well covered with small twigs, which always bear the fruit. The latter method will produce two or three times as much fruit as the former.

The head of an apple-tree should be formed at a height that will allow a team to pass around under its branches.

Distance apart.—In a full-grown orchard, that is designed to cover the ground, the trees should be two rods (thirty-three feet) apart. When it is designed always to cultivate the ground, and land is plenty, set them fifty or sixty feet apart. You will be likely always to have fine fruit, and a crop on the land beside. Our recommendation to every one is to set out all orchards, of whatever fruit, so as to have them cover the whole ground when in maturity. Among apple-trees, dwarf pears, peaches, or quinces, may be set, which will be profitable before the apples need all the ground.

Bearing years.—A cultivator may have a part of his orchard bear one year, and the remainder the next, or he may have them all bear every year. There are two reasons why a tree bears full this year and will not bear the next. One is, it is allowed to have such a superabundance of fruit to mature this year, that it has no strength to mature fruit-buds for the next, and hence a barren year; the other reason is, a want of proper culture and the specific manures for the apple. Manure highly, keep off the insects, cultivate well, and do not allow too much to remain on the trees one season, and you will have a good crop every year. But if one would let his trees take the natural course, but wishes to change the bearing year of half of his orchard, he can accomplish it

by removing the blossoms or young fruit from a part of his trees on the bearing year, and those trees having no fruit to mature will put forth an abundance of buds for fruit the following season; thus the fruit-season will be changed without lessening the productiveness. Go through a fruit-region in what is called the non-bearing seasons, and you will find some orchards and some trees very full of fruit. Trees of the same variety in another orchard near by will have very little fruit. This shows that the bearing season is a matter of mere habit, in all except what is determined by late frosts. This fact may be turned to great pecuniary value, by producing an abundance of apples every year.

Plowing and pasturing.—An apple-orchard should be often plowed, but not too deep among the roots. When not actually under the plow, it should be pastured, with fowls, calves, or sheep. Swine are recommended, as they will eat all the apples that fall prematurely, and with them the worms that made them fall. But we have often seen hogs, by their rooting and rubbing, kill the trees. Better to pick up the apples that fall too early, and give them to the swine. Turkeys and hens in an orchard will do much to destroy the various insects. They may be removed for a short time when they begin to peck the ripening fruit.

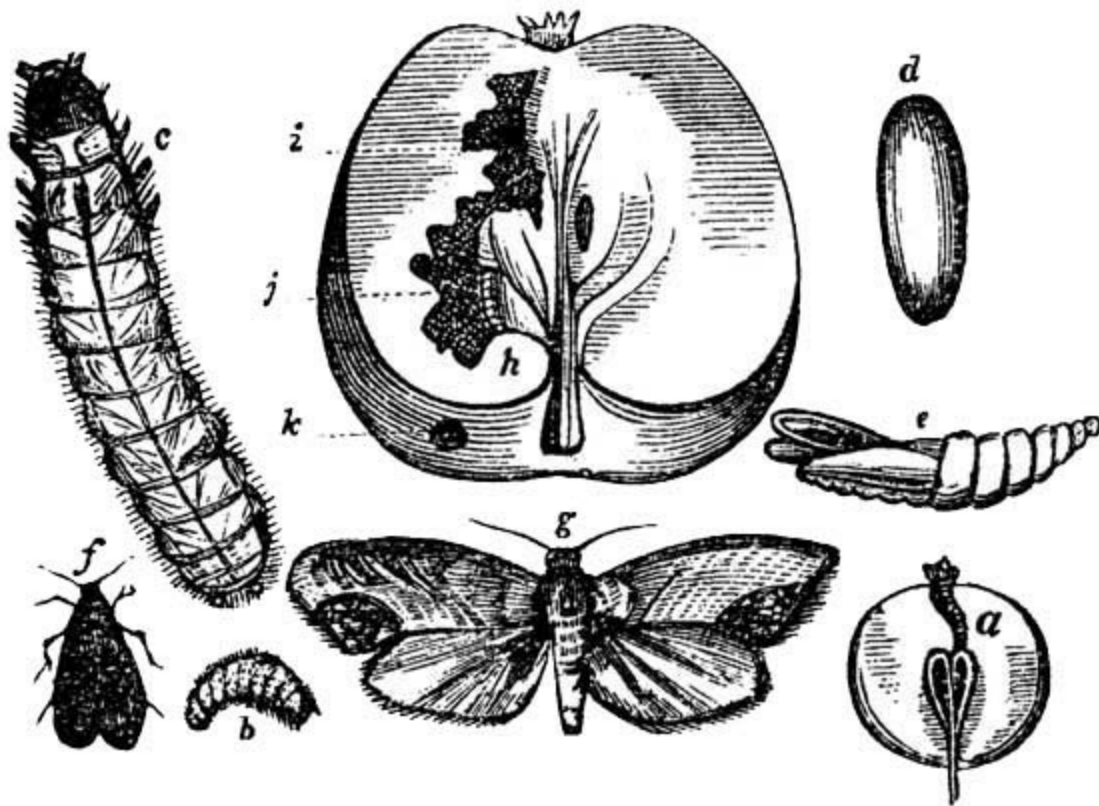
Orchards pastured by sheep are said not to be infested with caterpillars. Sheep pastured and salted under apple-trees greatly enrich the soil, and in those elements peculiarly beneficial.

Enemies.—There are several of these that are quite destructive, when not properly guarded against. Two things are necessary, and, united and thoroughly performed, they afford a remedy or a preventive for most of the depredations of all insects: 1. Keep the trees well cleared of all rough, loose bark, which affords so many hiding-places for insects.

2. Wash the trunks and large limbs of the trees, twice between the 25th of May and the 15th of August, with a ley of wood-ashes or dissolved potash. Apple-trees will bear it strong enough to kill some of the finest cherries. We add another very effectual wash. Let cultivators choose between the two. Into two gallons of water put two quarts of soft-soap and one fourth pound of sulphur. If you add tobacco-juice, or any other very offensive article, it will be still better.

Apple-worm.—The insect that produces this worm lays its egg in the blossom-end of the young apple. That egg makes a worm that passes down about the core and ruins the fruit. Apples so affected will fall prematurely, and should be picked up and fed to swine. This done every day during their falling, which does not last a great while, will remedy the evil in two seasons. The worm that crawls from the fallen apple gets into crevices in rough bark, and spins his cocoon, in which he remains till the following spring.

Bonfires, for a few evenings in the fore part of June, in an orchard infested with moths, will destroy vast numbers of them, before they have deposited their eggs. This can not be too strongly insisted upon.



Apple-Worms. *a* The young worm. *b* The full-grown worm. *c* The same magnified. *d* Cocoon. *e* Chrysalis. *f* Perfect insect. *g* The same magnified. *h i* Passage of the worm in the fruit. *j* Worm in the fruit. *k* Place of egress.

Bark-louse.—Dull white, oval scales, one tenth of an inch long, which sometimes appear on the stems of trees in vast numbers, may be destroyed by

the wash recommended above.

Woolly aphis—called in Europe by the misnomer, *American blight*—is very destructive across the water, but does not exist extensively on this side. It is supposed to exist, in this country, only where it has been introduced with imported trees. It appears as a white downy substance in the small forks of trees. This is composed of a large number of very minute woolly lice, which increase with wonderful rapidity. They are easily destroyed by washing with diluted sulphuric acid—three fourths of an ounce, by measure, from the druggist's—and seven and a half ounces of water, applied by a rag tied to the end of a stick. The operator must keep it from his clothes. After the first rain this is perfectly effectual.

Apple-tree borer.—This is a fleshy-white grub, found in the trunks of the trees. It enters at the surface of the ground where the bark is tender, and either girdles or thoroughly perforates the tree, causing its death. This is produced by a brown and white striped beetle about half an inch long. It does not go through its different stages annually, but remains a grub two or three years. It finally comes out in its winged state, early in June, flying in the night and laying its eggs. If the borers are already in the tree, they may be killed by cutting out, or by a steel wire thrust into their holes. But better prevent them. This can be done effectually by placing a small mound of ashes or lime around each tree early in the spring.

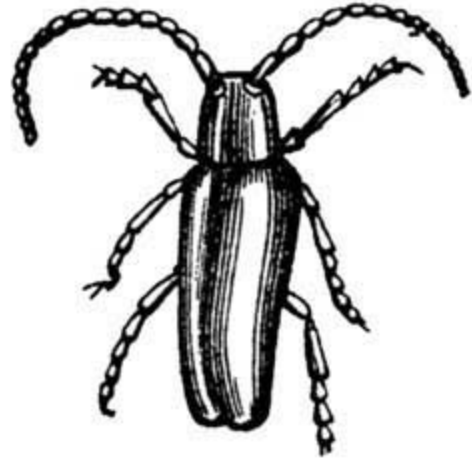
On nursery-trees their attacks may be prevented by washing with a solution of potash—two pounds in eight quarts of water. As this is a good manure, as well as a great remedy for insects, it had better be used every season.



Borer,



Eggs.



Beetle.

Caterpillars are the product of a miller of a reddish-brown color, measuring about an inch and a half when flying. They deposit many eggs about the forks and near the extremities of young branches. These hatch in spring, in season for the young foliage, on which they feed voraciously. When neglected for two or three years, they often defoliate large trees. The habits of the caterpillar are favorable to their destruction. They weave their webs in forks of trees, and are always at home in rainy weather, and in the morning till nine o'clock. The remedy is to kill them. This is most effectually done by a sponge on the end of a pole, dipped in strong spirits of ammonia. Each one touched by it is instantly killed, and it is not difficult to reach them all. They may also be rubbed off with a brush or swab on the end of a pole, and burned. The principle is to get them off, web and all, and destroy them. This can always be effectually done, if attended to early in the season, and early in the morning. If any have been missed, and come out in insects to deposite more eggs, bonfires are most effectual. These should be made of shavings, in different parts of the orchard, and about the middle of June, earlier or later, according to latitude and season. The ends of twigs on which the eggs are laid in bunches of hundreds (see figure), may be cut off in the fall and destroyed. As this can be done with pruning-shears, it may be an economical method of destroying them.



Caterpillar Eggs.



Canker-worm Moths, Male and Female.

Canker-worm.—The male moth has pale-ash colored wings, with a black dot, and is about an inch across. The female has no wings, is oval in form, dark-ash colored above, and gray underneath. These rise from the ground as early in spring as the frost is out. Some few rise in the fall. The females travel slowly up the body of the tree, while the winged males fly about to pair with them. Soon you may discover the eggs laid, always in rows, in forks of branches and among the young twigs. Every female lays nearly a hundred, and covers them over carefully with a transparent, waterproof glue. The eggs hatch from May 1st to June 1st, according to the latitude and season, and come out an ash-colored worm with a yellow stripe. They are very voracious, sometimes entirely stripping an orchard of its foliage. At the end of about four weeks they descend to the ground, to remain in a chrysalis state, about four inches below the surface, until the following spring. These worms are very destructive in some parts of New England, and have been already very annoying, as far west as Iowa. They will be likely to be transported all over the country on young trees. Many remedies are proposed, but to present them all is only to confuse. The best of anything is sufficient. We present two, for the benefit of two classes of persons. For all who have care enough to attend to it, the best remedy is to bind a handful of straw around the tree, two feet from the ground, tied on with one band, and the ends allowed to stand out from the tree. The females, who can not fly, but only ascend the trunk by crawling, will get up under the straw, and may easily be killed, by striking a covered mallet on the straw, and against the tree below the band. This should be attended to every day during the short season of their ascent, and all will be destroyed. Burn the straw about the last of May. But those who are too

indolent or busy to do this often till their season is past, may melt India-rubber over a hot fire, and smear bandages of cloth or leather previously put tight around the tree. This will prevent the female moth from crossing and reaching the limbs. Tar is used, but India-rubber is better, as weather will not injure it as it will tar, so as to allow the moth to pass over. Put this on early and well, and let it remain till the last of May. But the first, the process of killing them, is far the best.

Gathering-and preserving.—All fruit, designed to be kept even for a few weeks, should be picked, and not shaken off, and laid, not dropped into a basket, and with equal care put into the barrels in which it is to be kept or transported. The barrel should be slightly shaken and filled entirely full. Let it stand open two days, to allow the fruit to sweat and throw off the excessive moisture. Then head up tight, and keep in a cool open shed until freezing weather; then keep where they can occasionally have good air, and in as cool a place as possible, without danger of freezing. Of all the methods of keeping apples on shelves, buried as potatoes, in various other articles, as chaff, sawdust, &c., this is, on the whole, the best and cheapest. Wrapping the apples in paper before putting them into the barrels, may be an improvement. Apples gathered just before hard frosts, or as they are beginning to ripen, but before many have fallen from the trees, and packed as above, and the barrels laid on their sides in a good dry, dark cellar, where air can occasionally be admitted, can be kept in perfection from six to eight weeks, after the ordinary time for their decay. Apples for cider, or other immediate use, may be shaken off upon mats or blankets spread under the tree for that purpose. They are not quite so valuable, but it saves times in gathering.

Varieties are exceedingly numerous and uncertain. Cole estimates that two millions of varieties have been produced in the single state of Maine, and that thousands of kinds may there be found superior to those generally recommended in the fruit-books. The minute description of fruits is not of the least use to one out of ten thousand cultivators. The best pomologists differ in the names and descriptions of the various fruits. Some varieties have as many as twenty-five synonyms. Of what use, then, is the minute description of the hundred and seventy-seven varieties of Cole's American fruit-book, or of the vast numbers described by Downing, Elliott, Barry, and Hooper? The best pear we saw in Illinois could not be identified in Elliott's fruit-book by a practical fruit-grower. We had in our orchard in Ohio a single apple-tree,

producing a large yield of one of the very best apples we ever saw; it was called Natural Beauty. We could not learn from the fruit-books what it was. We took it to an amateur cultivator of thirty years' experience, and he could not identify it. This is a fair view of the condition of the nomenclature of fruits. The London experimental gardens are doing much to systemize it, and the most scientific growers are congratulating them on their success. But it never can be any better than it is now. Varieties will increase more and more rapidly, and synonyms will be multiplied annually, and the modification of varieties by stocks, manures, climates, and location, will render it more and more confused.

We can depend only upon our nurserymen to collect all improved varieties, and where we do not see the bearing-trees for ourselves, trust the nurseryman's description of the general qualities of fruit. Seldom, indeed, will a cultivator buy fruit-trees, and set out his orchard, and master the descriptions in the fruit-books, and after his trees come into bearing, minutely try them by all the marks to see whether he has been cheated, and, if so, take up the trees and put out others, to go the same round again, perhaps with no better success. Hence, if possible, let planters get trees from a nursery so near at hand that they may know the quality of the fruit of the trees from which the grafts are taken, get the most popular in their vicinity, and always secure a few scions from any extraordinary apple they may chance to taste. It is well, also, to deal only with the most honorable nurserymen. Remember that varieties will not do alike well in all localities. Many need acclimation. Every extensive cultivator should keep seedlings growing, with a view to new varieties, or modifications of old ones, adapted to his locality.

We did think of describing minutely a few of the best varieties, adapted to the different seasons of the year. But we can see no advantage it would be to the great mass of cultivators, for whom this book is designed. Those who wish to acquaint themselves with those descriptions will purchase some of the best fruit-books. We shall content ourselves with giving the lists, recommended by the best authority, for different sections, followed by a general description of the *qualities* of a few of the best. Downing's lists are the following:—

APPLES FOR MIDDLE AND SOUTHERN PORTIONS OF THE EASTERN STATES, RIPENING IN SUCCESSION.

Early Harvest.	Vandevere of New York.
Red Astrachan.	Jonathan.
Early Strawberry.	Melon.
Summer Rose.	Yellow Bellflower.
William's Favorite.	Domine.
Primate.	American Golden Russet.
American Summer Pearmain.	Cogswell.
Garden Royal.	Peck's Pleasant.
Jefferis.	Wagener.
Porter.	Rhode Island Greening.
Jersey Sweet.	King of Tompkins County.
Large Yellow Bough.	Swaar.
Gravenstein.	Lady Apple.
Maiden's Blush.	Ladies' Sweet.
Autumn Sweet Bough.	Red Canada.
Fall Pippin.	Newtown Pippin.
Mother.	Boston Russet.
Smokehouse.	Northern Spy.
Rambo.	Wine Sap.
Esopus Spitzenburg.	Baldwin.

APPLES FOR THE NORTH.

Red Astrachan.	Fameuse.
Early Sweet Bough.	Pomme Gris.
Saps of Wine or Bell's Early.	Canada Reinette.
Golden Sweet.	Golden Ball.

William's Favorite.	St. Lawrence.
Porter.	Jewett's Fine Red.
Dutchess of	Rhode Island
Oldenburgh.	Greening.
Keswick Codlin.	Baldwin.
Hawthornden.	Winthrop
	Greening.
Gravenstein.	Danvers Winter-
	Sweet.
Mother.	Ribston Pippin.
Tolman Sweet.	Roxberry Russet.
Yellow Bellflower.	

APPLES FOR THE WESTERN STATES,

Made up from the contributions of twenty different cultivators, from five Western states.

Early Harvest.	Domine.
Carolina Red	Swaar.
June.	
Red	Westfield Seek-no-
Astrachan.	further.
American	
Summer	Broadwell.
Pearmain.	
Sweet June.	Vandevere of New York,
	or Newtown Spitzenburg.
Large Sweet	Ortly, or White
Bough.	Bellflower.
Summer	Yellow Bellflower.
Queen.	
Maiden's	White Pippin.
Blush.	
Keswick	

Codlin.	American Golden Russet.
Fall Wine.	Herfordshire Pearmain.
Rambo.	White Pearmain.
Belmont.	Wine Sap.
Fall Pippin.	Rawle's Janet.
Fameuse.	Red Canada.
Jonathan.	Willow Twig.
Tolman Sweet.	

APPLES FOR THE SOUTH AND SOUTHWEST.

Early Harvest.	Nickajack.
Carolina Juice.	Maverack's Sweet.
Red Astrachan.	Batchelor or King.
Gravenstein.	Buff.
American Summer Pearmain.	Shockley.
Julian.	Ben Davis.
Mangum.	Hall.
Fall Pippin.	Mallecarle.
Maiden's Blush.	Horse.
Summer Rose.	Bonum.
Porter.	Large Striped Pearmain.
Rambo.	Rawle's Janet.
Large Early Bough.	Disharoon.
Fall Queen, or Ladies' Favorite.	Meigs.
Oconee Greening.	Camack's Sweet.
Cullasaga.	

Some varieties are included in all these lists, showing that the best cultivators

regard some of our finest apples as adapted to all parts of the country. A careful comparison of Hooper's lists, as recommended by the best Western cultivators, whose names are there mentioned, will show that they name the same best varieties, with a few additions.

We have carefully examined the varieties recommended by Ernst, by Kirtland and Elliott, by Barry, and by the national convention of fruit-growers, and find a general agreement on the main varieties. There are some differences of opinion, but they are minor. They have left out some of Downing's list, and added some, as a matter of course. All this only goes to show the established character of our main varieties. Out of all these, select a dozen of those named, in most of the lists, and you will have all that ever need be cultivated for profit. The best six might be still better. Yet, in your localities, you will find good ones not named in the books, and new ones will be constantly rising.

Downing adds that "Newtown Pippin does not succeed generally at the West, yet in some locations they are very fine. Rhode Island Greening and Baldwin generally fail in many sections, while in others they are excellent."

Now, it is contrary to all laws of vegetation and climate, that a given fruit should be good in one county and useless in the next, if they have an equal chance in each place. A suitable preparation of the soil, in supplying, in the specific manures, what it may lack, getting scions from equally healthy trees, and grafting upon healthy apple-seedling stocks—observing our principles of acclimation—*and not one of our best apples will fail, in any part of North America.*

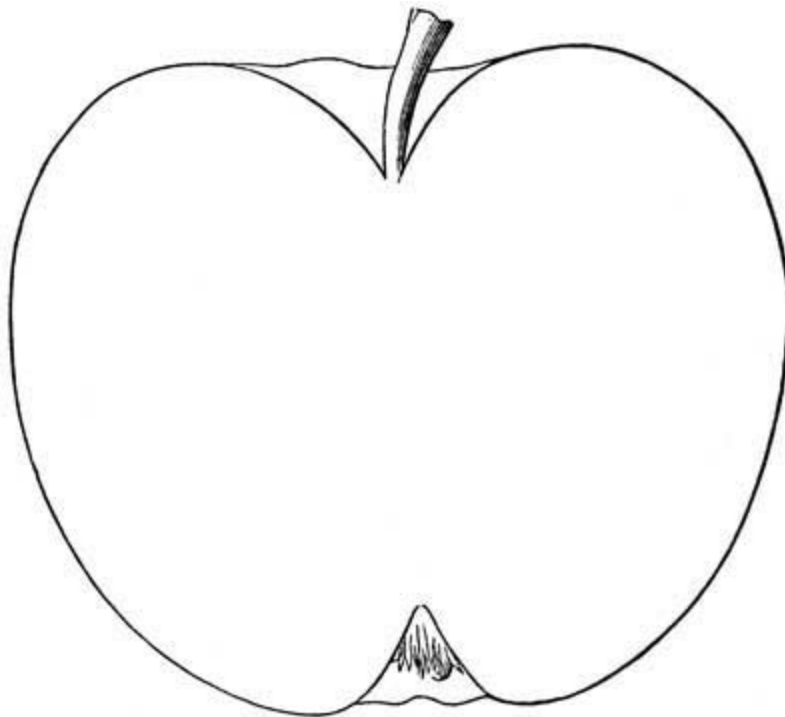
On a given parallel of latitude, a man may happen to plant a tree upon a fine calcareous soil, and it does well. Another chances to plant one upon a soil of a different character, and it does not succeed. It is then proclaimed that fruit succeeds well in one locality, and is useless in another near by and in the same latitude. The truth is, had the latter supplied calcareous substances to his deficient soil, as he might easily have done, in bones, plaster, lime, &c., the fruit would have done equally well in both cases. We should like to see this subject discussed, as it never has been in any work that has come under our observation. It would redeem many a section from a bad reputation for fruit-growing, and add much to the luxuries of thousands of our citizens.

Apples can be successfully and profitably grown on every farm of arable land in North America. We present, in the following cuts, a few of our best apples, in their usual size and form. Some are contracted for the want of room on the page. We shall describe a few varieties, in our opinion the best of any grown in this country. These are all that need be cultivated, and may be adapted to all localities. We lay aside all technical terms in our description, which we give, not for purposes of identification, but to show their true value for profitable culture. The quality of fruit, habits of the tree, and time of maturity, are all that are necessary, for any practical purpose.

NICKAJACK.—*Synonyms*—Wonder, Summerour.

Origin, North Carolina. Tree vigorous, and a constant prolific bearer. Fruit large, skin yellowish, shaded land striped with crimson, and sprinkled with lightish dots. Yellowish flesh, fine subacid flavor. Tender, crisp, and juicy. Season, November to April.

BALDWIN.—*Synonyms*—Late Baldwin, Woodpecker, Pecker, Steele's Red Winter.

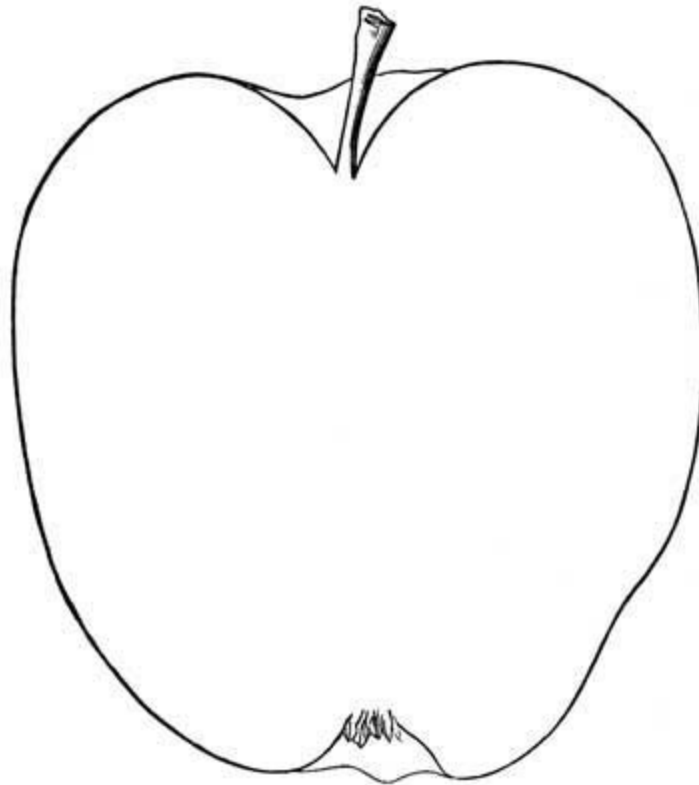


Stands at the head of all apples, in the Boston market. Fruit large and handsome. Tree hardy, and an abundant bearer. It is of the family of Esopus Spitzenburg. Yellowish white flesh, crisp and beautiful flavor, from a mingling of the acid and saccharine. Season, from November to March. On some rich western soils, it is disposed to bitter rot, which may be easily prevented, by application to the soil of lime and potash.

CANADA RED.—*Synonyms*—Old Nonsuch, Richfield Nonsuch, Steele's Red Winter.

An old fruit in Massachusetts and Connecticut. Tree not a great grower, but a profuse bearer. Good in Ohio, Michigan, and other Western states. Retains its fine flavor to the last. January to May.

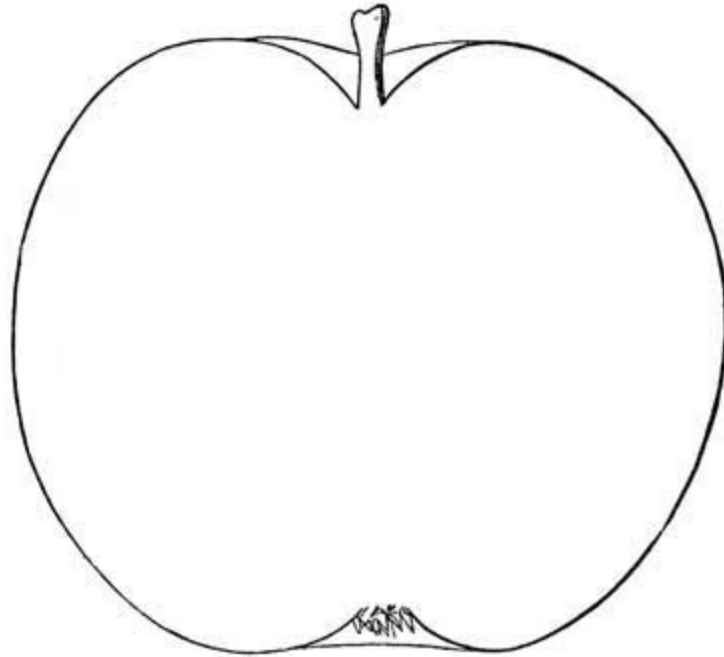
BELLFLOWER.—*Synonyms*—Yellow Bellflower, Lady Washington, Yellow Belle-fleur.



Fruit very large, pale lemon yellow, with a blush in the sun. Subacid, juicy,

crisp flesh. Tree vigorous, regular and excellent bearer. Season, November to March. Highly valuable.

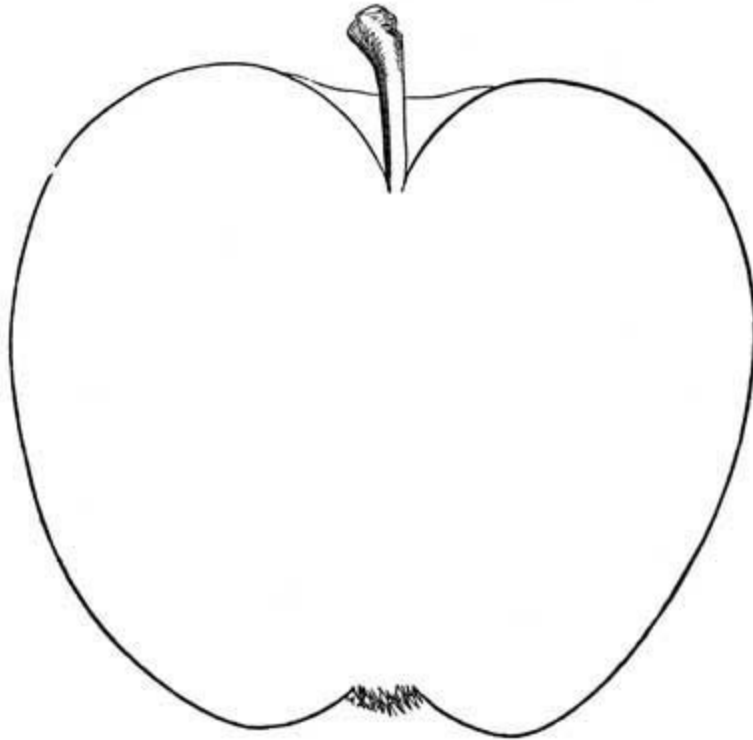
EARLY HARVEST.—*Synonyms*—Early French Reinette, Prince's Harvest, July Pippin, Yellow Harvest, Large White Juneating, Tart Bough.



The best early apple. Bright straw color. Subacid, white, tender, juicy, and crisp. Equally good for cooking and the dessert. Season, the whole month of July in central New York; earlier south, and later north, as of all other varieties.

RED ASTRACHAN.—Brought to England from Sweden in 1816. One of the most beautiful apples in the whole list. Fruit very large, and very smooth and fair. Color deep crimson, with a little greenish yellow in the shade and occasionally a little russet near the stalk. Flesh white and crisp, rich acid flavor. Gather as soon as nearly ripe, or it will become mealy. Abundant bearer. July and August.

ESOPUS SPITZENBURG.—*Synonym*—True Spitzenburg.

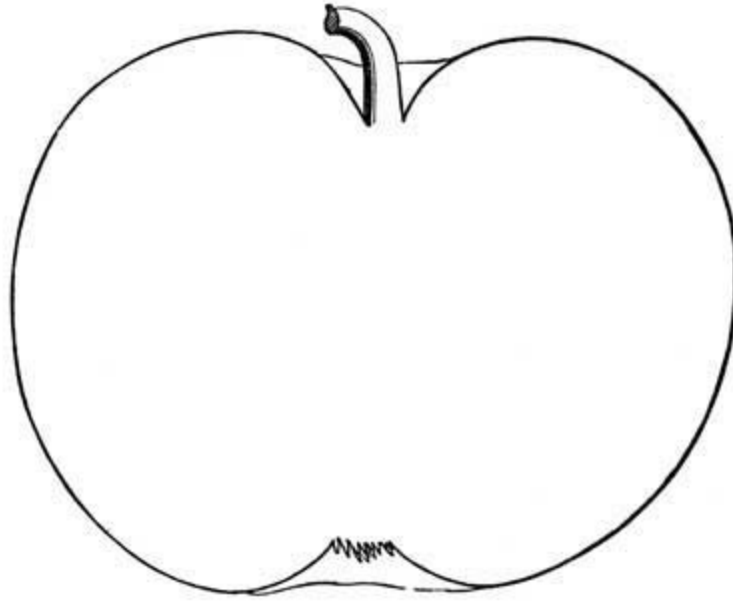


Large, fine flavored, lively red fruit. It is everywhere well known, as one of the very best apples ever cultivated, both for cooking and the desert. December to February, and often good even into April. A very great bearer.

KING OF TOMPKINS COUNTY.—*Synonym*—King Apple.

This is an abundant annual bearer. Skin rather yellowish, shaded with red and striped with crimson. Flesh rather coarse, but juicy and tender, with a very agreeable vinous aromatic flavor. One of the best. December and March.

RHODE ISLAND GREENING.—*Synonyms*—Burlington Greening, Jersey Greening, Hampshire Greening.



A universal favorite, everywhere known. Acid, lively, aromatic, excellent alike for the dessert and kitchen. Great bearer. November to March. It is said to fail on some rich alluvial soils at the West. Avoid root grafting, and apply the specific manures, and we will warrant it everywhere.

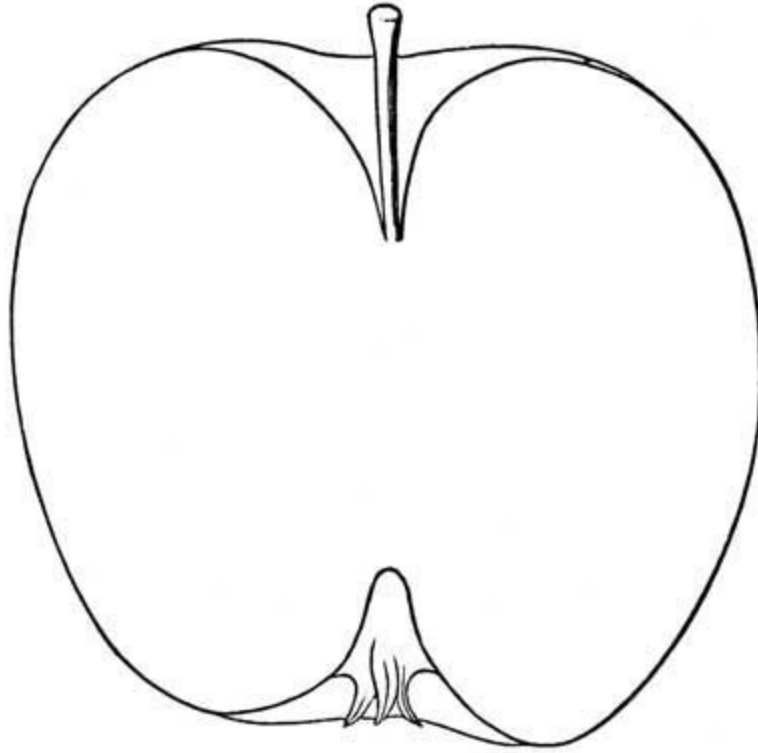
BONUM.—*Synonym*—Magnum Bonum.

From North Carolina. Fruit large, from light to dark red. Flesh yellow, subacid, rich, and delicious. Tree hardy, vigorous, and an early and abundant bearer.

AMERICAN GOLDEN RUSSET.—*Synonyms*—Sheep Nose, Golden Russet, Bullock's Pippin, Little Pearmain.

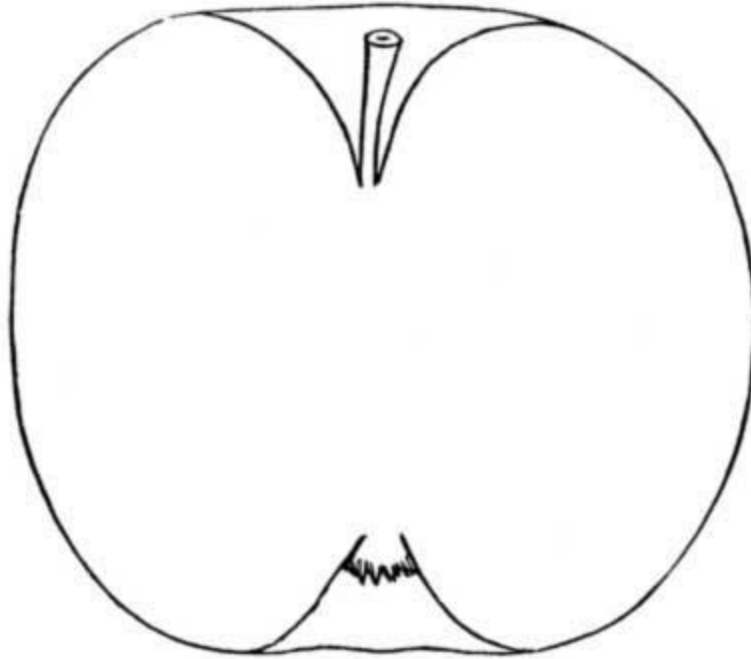
The English Golden Russet is a variety cultivated in this country, but much inferior to the above. The fruit is small, but melting juicy, with a very pleasant flavor. It is one of the most regular and abundant bearers known. Tree hardy and thrifty. October to January. We know from raising and using it at the West, that it is one of the very best.

PIPPIN, FALL.—Confounded with Holland Pippin and several other varieties.



A noble fruit, unsurpassed by any other autumn apple. Very large, equally adapted to table and kitchen. Fine yellow, when fully ripe, with a few dots. Flesh is white, mellow, and richly aromatic. October and December. A fair bearer, though not so great as many others.

NEWTOWN PIPPIN.—*Synonyms*—Green Newtown Pippin, Green Winter Pippin, American Newtown Pippin, Petersburg Pippin.



This is put down as the first of all apples. It commands the highest price, in the London market. It keeps long without the least shriveling or loss of flavor. Fruit medium size, olive green, with small gray specks. Flesh greenish white, juicy, crisp, and of an exceedingly delicious flavor. *The best keeping apple*, good for eating from December to May.

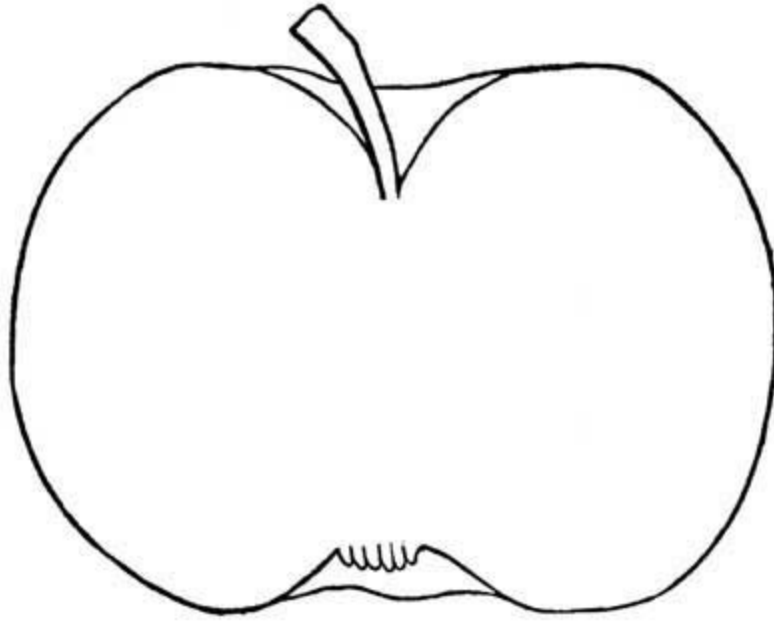
The yellow pippin, is another variety nearly as good.

PORTER.—A Massachusetts fruit, very fair; a very great bearer. Is a favorite in Boston. Deserves general cultivation. September and into October.

SMOKEHOUSE.—*Synonyms*—Mill Creek Vandevere, English Vandevere.

An old variety from Pennsylvania, where the original tree grew by a gentleman's smoke-house; hence its name. Skin yellow, shaded with crimson, sprinkled with large gray or brown dots. September to February. One of the very best for cooking.

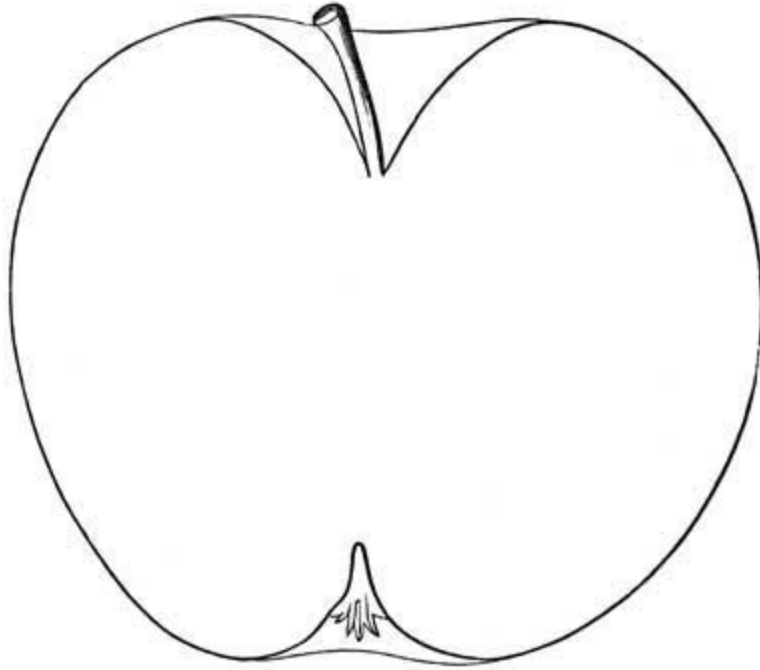
RAMBO.—*Synonyms*—Romanite, Bread and cheese apple, Seek-no-further.



This is a great fall apple. Medium size, flat, yellowish white in the shade, and marbled with pale yellow and red in the sun, and speckled with large rough dots. Flesh greenish white, rich, subacid. October to December.

CANADA REINETTE.—This has ten synonyms in Europe, which indicates its popularity. In this country it is known only under the above name. Fruit of the very largest size. A good bearer. The quality is in all respects good. Lively, subacid flavor. December to April, unless allowed to hang on the tree too long. Pick early in the fall.

ROME BEAUTY.—*Synonyms*—Roman Beauty, Gillett's Seedling.

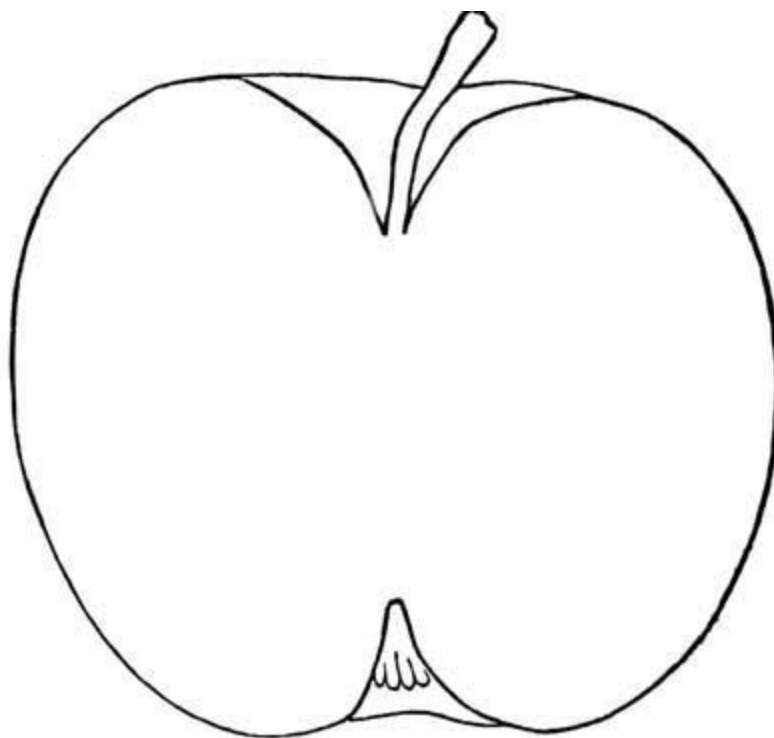


Fruit large, yellow, ground shaded, and striped with red, and sprinkled with little dots. Flesh yellowish, juicy, tender, subacid. Bears every year a great crop of very large showy apples. It is not superior in flesh or flavor, but keeps and sells very well. Always must be very profitable, and hence very popular.

AUTUMN SWEET BOUGH.—*Synonyms*—Late Bough, Fall Bough, Summer Bell Flower, Philadelphia Sweet.

Tree very vigorous and productive. Fruit medium. Skin smooth, pale yellow with a few brown dots. Flesh white, tender, sweet vinous flavor. One of the best dessert sweet apples. August and October.

WESTFIELD SEEK-NO-FURTHER.—*Synonyms*—Seek-no-further, Red Winter Pearmain, Connecticut Seek-no-further.

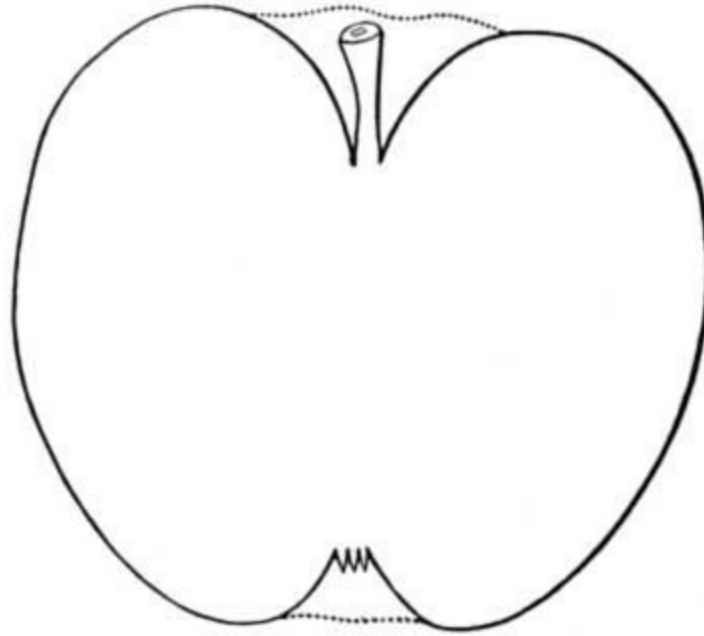


Fruit large, pale dull red, sprinkled with obscure russet yellow dots. Flesh white, tender and fine-grained. On all accounts good. October to February according to Downing. Elliott says from December to February. But the doctors often disagree. So you had better eat your apples when they are good, whether it be October or December, or according to Downing, Elliott, or Hooper.

RIBSTON PIPPIN.—*Synonyms*—Glory of York, Travers', Formosa Pippin, Rock hill's Russet.

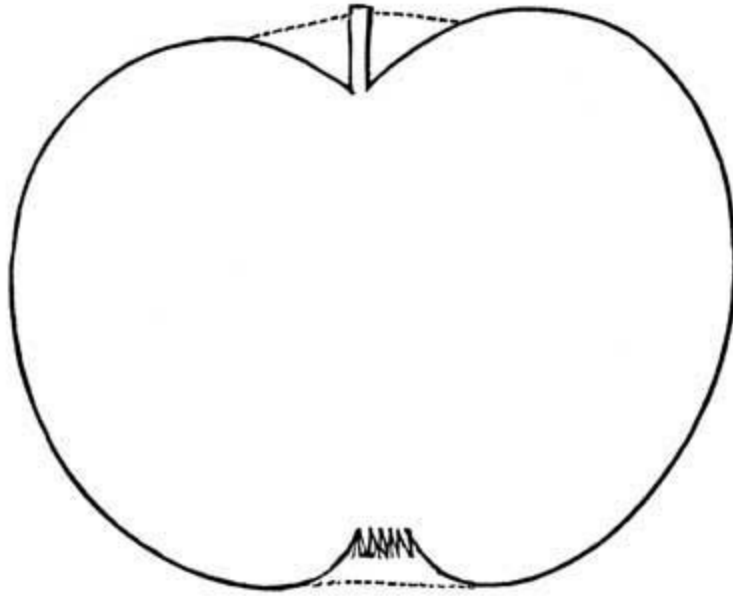
This occupies as high a place in England, as any other apple. In this country, two or three others, as Baldwin and Newtown Pippin, are more highly esteemed. This is most successfully grown in the colder parts of the United States and Canada. Fruit medium, deep yellow, firm, crisp; flavor sharp aromatic. November to April.

NORTHERN SPY.—This is a new American variety, with no synonyms. It originated near Rochester, N. Y.



There is not a better dessert apple known. It retains its exceedingly pleasant juiciness, and excellent flavor from January to June. In western New York, they have been carried to the harvest field, in July in excellent condition. A fair bearer of beautiful fruit. Subacid with a peculiar freshness of flavor. Dark stripes of purplish red in the sun, but a greenish pale yellow in the shade. High culture and an open top for admission of the sun, affects the fruit more favorably than any other.

ROXBURY RUSSET.—*Synonyms*—Boston Russet, Putnam Russet.



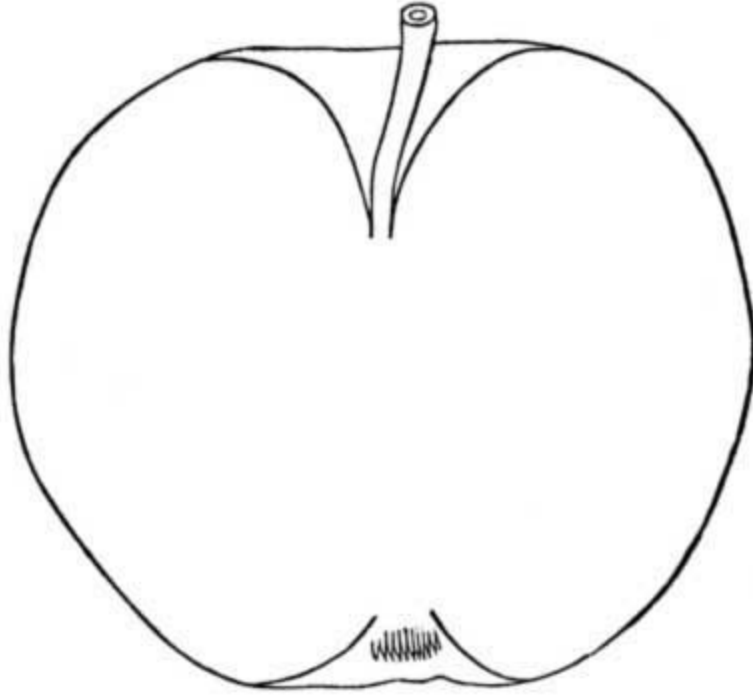
An excellent fruit, and prodigious bearer. Medium size, flesh greenish white, rather juicy, and subacid. Good in January, and one of the best in market in June.

There are other russets of larger size, but much inferior. This should be in every collection. It is not first in richness and flavor, but it is superior to most in productiveness, and is one of the best keepers.

LARGE YELLOW BOUGH.—*Synonyms*—Early Sweet Bough, Sweet Harvest, Bough.

No harvest-apple equals this, except the EARLY HARVEST. Excellent for the dessert, but rather sweet for pies and sauce. Fruit above medium. Tree a moderate grower, but a profuse bearer. Flesh white and very tender. Very sweet and sprightly. July and August. Should have a place, even in a small collection.

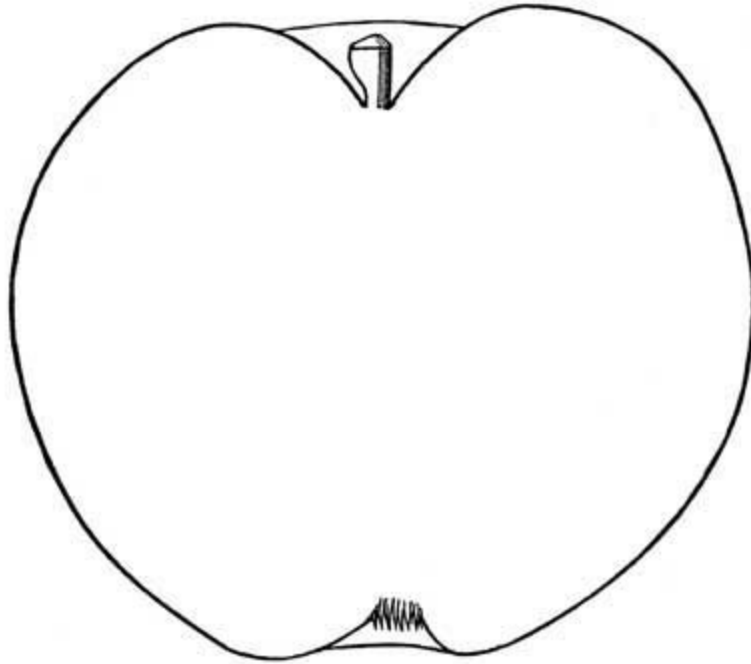
SWAAR.—One of the best American fruits. Its name in Dutch, where it originated on the Hudson River, means heavy.



Fruit is large, and when fully ripe, of a dead gold color, dotted with many brown specks. Flesh yellowish, fine grained, and tender. Flavor aromatic and exceedingly rich. Bears good crops. December to March.

WINESAP.—This is one of the best apples for cider, and good also for the table and kitchen. Fruit hangs long on the tree without injury. It is very productive, and does well on a variety of soils. Very fine in the West. Yellow flesh, very firm, and high flavored. November to May. Deservedly, a very popular orchard variety.

MAIDEN'S BLUSH.—A comparatively new variety from New Jersey. Remarkably beautiful. Admired as a dessert fruit, and equally good for the kitchen and for drying. Clear lemon yellow, with a blush cheek, sometimes a brilliant red cheek. Rapid growing tree, with a fine spreading head, bearing most abundantly. August and October.



LADIES' SWEETING.—The finest sweet apple, for dessert in winter, that has yet been produced. Skin smooth and nearly covered with red, in the sun. Flesh is greenish white, very tender, juicy, and crisp. Without any shriveling or loss of flavor, it keeps till May. So good a winter and spring sweet apple is a desideratum in any orchard or garden.

The foregoing are all that any practical cultivator will need. Most will select from our list, perhaps half a dozen, which will be all they wish to cultivate. From our descriptions, which are not designed to enable planters to identify the varieties, but to ascertain their qualities, any one can select such as he prefers. And they are so generally known, that there will be but little danger of getting varieties, different from those ordered.

We subjoin, from Hooker's excellent Western Fruit-Book, the following—

LIST OF APPLES FOR THE WESTERN STATES.

"The following list," says Hooker, "contains a catalogue of the most popular varieties of apples, recommended by various pomological societies of the United States for the Western states." These varieties can be obtained of all respectable nurserymen. The list may be of use to some cultivators in the different states mentioned. The general qualities of the best of these will be

found in our descriptions under the cuts:—

Baldwin.—Ohio, Missouri, Illinois.

Roxbury Russet.—Michigan, Ohio, Missouri, Indiana, Illinois.

Rhode Island Greening.—Michigan, Iowa, Ohio, Missouri, Illinois.

Swaar.—Ohio, Illinois, Michigan.

Esopus Spitzenburg.—Missouri, Illinois, Michigan, Ohio.

Early Harvest.—Virginia, Ohio, Missouri, Indiana, Illinois, Michigan, Iowa.

Sweet Bough.—Illinois, Virginia, Missouri, Indiana, Ohio.

Summer Rose.—Ohio, Missouri, Illinois.

Fall Pippin.—Michigan, Virginia, Ohio, Missouri, Illinois.

Belmont.—Michigan, Ohio.

Golden Sweet.—Missouri.

Red Astrachan.—Iowa, Ohio, Missouri, Illinois.

Jonathan.—Ohio, Missouri.

Early Strawberry.—Ohio.

Danvers Winter Sweet.—Ohio.

American Summer Pearmain.—Illinois.

Maiden Blush.—Ohio, Missouri, Indiana, Illinois.

Porter.—Ohio, Missouri.

Gravenstein.—Ohio.

Vandevere.—Missouri, Indiana, Illinois.

Yellow Bellflower.—Michigan, Iowa, Virginia, Ohio, Missouri, Illinois.

Fameuse.—Illinois.

Newtown Pippin.—Michigan, Iowa, Ohio, Missouri, Indiana, Illinois.

Rambo.—Michigan, Iowa, Ohio, Missouri, Indiana, Illinois.

Smokehouse.—Virginia, Indiana.

Fallawalden.—Ohio.

Golden Russet.—Ohio, Illinois.

Wine Sap.—Ohio, Illinois.

White Bellflower.—Missouri, Illinois.

Holland Pippin.—Michigan, Missouri, Indiana.

Raule's Janet.—Iowa, Virginia, Illinois.

Lady Apple.—Ohio, Missouri.

For the value of these varieties, in the states mentioned, you have the

authority of the best pomological societies. The several states are mentioned so frequently, that it will be seen that most of them are adapted to all the states. Attend to acclimation and manure, and guard against insects, and they will all flourish, in all parts of the West and of the Union.

APRICOT.

This is a fruit about half-way between a peach and a plum. The stone is like the plum, and the flesh rather more like the peach. It is esteemed, principally, because it comes earlier in the season than anything else of the kind.

It is used as a dessert-fruit, for preserving, drying, and various purposes in cookery. It does well on plum-stock, and best in good deep, moist loam, manured as the peach and plum. The best varieties produce their like from the seed. Seedlings are more hardy than any grafted trees. Grafts on plums are much better than on the peach. The latter seldom produce good hardy, thrifty trees, although many persist in trying them. The apricot is a favorite tree for espalier training against walls and fences, in small yards, where it bears luxuriantly. It also makes a good handsome standard tree for open cultivation.

It is as much exposed to depredations from curculio as the plum, and must be treated in the same way. Cultivation same as peach. It produces its fruit, like the peach, only on wood of the previous year's growth; hence it must be pruned like the peach. Especially must it be headed in well, to secure the best crop.

Varieties are quite numerous, a few of which only deserve cultivation. Any of the nine following varieties are good:—

BROWN'S EARLY.—Yellow, with red cheek. A very productive, great grower.

NEWHALL'S EARLY.—Bright-orange color, with deep-red cheek. A good cling-stone variety, every way worthy of cultivation.

MOORPARK.—Yellow, with ruddy cheek. An enormous bearer, though of slow growth. It is a freestone variety of English origin, and needing a little protection in our colder latitudes.

DUBOIS' EARLY GOLDEN.—Color, pale-orange. Very hardy and productive. In

1846, the original tree at Fishkill, N. Y., bore ninety dollars' worth of fruit.

LARGE EARLY.—Orange, but red in the sun. An excellent, early, productive variety.

HEMSKIRKE.—Bright-orange, with red cheek. An English variety, vigorous tree, and good bearer.

PEACH.—Yellow, with deep-brown on the sun-side. An excellent French variety.

BREDA.—Deep-orange, with blush spots in the sun. A vigorous, productive, African variety.

ROMAN.—Pale-yellow, with occasionally red dots. Good for northern latitudes.

From these, planters may select those that best suit their localities and fancy. They are a little liable to be frost-bitten in the blossoms, as they bloom very early. Otherwise they are always very productive. They are ornamental, both in the leaf and in the blossom. Eaten plain, before thoroughly ripe, they are not healthy; otherwise, harmless and delicious. Every garden should have half a dozen.

ARTICHOKE.

There are two plants known by this name. The Jerusalem artichoke, so called, not from Jerusalem in Palestine, but a corruption of the Italian name which signifies the tuber-rooted sunflower. The tubers are only used for pickling. They make a very indigestible pickle, and the plant is injurious to the garden, so they had better not be raised.

The artichoke proper grows something like a thistle, bearing certain heads, that, at a particular stage of their growth, are fine for food.

The soil should be prepared as for asparagus, only fifteen inches deep will do well. The plot of ground should be where the water will not stand on it at any time in the winter, as it will on most level gardens. This will kill the roots. When a new bed is made with slips from old plants, carefully separate vigorous shoots, remove superfluous leaves, plant five inches deep in rows

five feet apart, and two feet apart in the rows. Keep very clean of weeds. The first year, some pretty good, though not full-sized heads will be produced. Plant fresh beds each year, and you will have good heads from July to November. Small heads will grow out along the stalk like the sunflower. Remove most of these small ones when they are about the size of hens' eggs, and the others will grow large. When the scales begin to diverge, but before the blossoms come out, is the time to cut them for use. Lay brush over them to prevent suffocation, and cover with straw in winter, to protect from severest cold. Too much warmth, however, is more injurious than frost.

Spring-dress much like asparagus. Remove from each plant all the stocks but two or three of the best. Those removed are good for a new bed. A bed, properly made, will last four or five years.

To save seed, bend down a few good heads, so as to prevent water from standing in them; tie them to a stake, until the seed is matured. But, like Early York cabbage, imported seed is better. The usual way of serving them is, the full heads boiled. In Italy the small heads are cut up, with oil, salt, and pepper. This vegetable would be a valuable accession to American kitchen gardens.

ASHES.

Are one of the best applications to the soil, for almost all plants. Leached ashes are a valuable manure, but not equal to unleached. Few articles about a house or farm should be saved with greater care. Be as choice of them as of your small change. They are worth three times as much on the land as they can be sold for other purposes. On corn, at first hoeing, they are nearly equal to plaster. On onions and vines, they promote the growth and keep off the insects. Sprinkle on dry, when plants are damp, but not too wet. Do not put wet ashes on plants, or water while the ashes are on. It will kill them. Mix ashes and plaster with other manures, and their power will be greatly increased. Mixed in manure of hot-beds, they accelerate the heat. On sour land they are equal to lime for correcting the acidity.

ASPARAGUS.

This is a universal favorite in the vegetable garden. By the application of sand and compost, the soil should be kept loose, to allow the sprouts to spring easily from the crowns. Propagation is best effected by seed, transplanting after one year's growth. Older roots divided and transplanted are of some value, but not equal to young roots, nor will they last as long.

Preparation of the soil for an asparagus-bed is most important to success. Dig a trench on one edge of the plat designed for the bed, and the length of it, eighteen inches wide and two feet deep. Put in the bottom one foot of good barn-yard manure, and tread down. Then spade eighteen inches more, by the side of and as deep as the other, throwing the soil upon the manure in the trench. Fill with manure and proceed as before, and so until the whole plat has been trenched; then wheel the earth from the first ditch to the other side and fill into the last trench, thus making all level. If there is danger that water will stand in the bottom, drain by a blind ditch. If this is objected to as too expensive, let it be remembered that such a bed, with a little annual top-dressing, will be good for twenty years, which is the age at which asparagus-plants begin to deteriorate; then a new bed should be ready to take its place.

Planting.—Mark the plat into beds five feet wide, leaving paths two feet wide between them. In each bed put four rows lengthwise, which will be just fifteen inches apart, and set plants fifteen inches apart in the row. Dig a trench six inches wide and six inches deep for each row; put an inch of rich mould in the bottom; set the plants on the mould, with the roots spread naturally, with the ends pointing a little downward. Be very particular about the position of the roots. Fill the trench, and round it up a little with well-mixed soil and fine manure. The bed is then perfect, and will improve for many years.

After-Culture.—In the fall, after the frost has killed the stalks, cut them down and burn them on the bed. Cover the bed with fine rotted manure, to the depth of two inches, and one half-bushel salt to each square rod. As soon as frost is out in spring, with a fork work the top-dressing into the soil to the depth of four inches, and stir the soil to the depth of eight inches between the rows, using care not to touch the crowns of the roots with the fork.

Cutting should never be performed until the third year. Set out the plants when one year old, let them grow one year in the bed, and the next year they

will be fit to cut. Cut all the shoots at a suitable age, up to the last days of June. The shoots should be regularly cut just below the surface, when they are four or six inches high. If you are tempted to cut after the 25th of June, leave two or three thrifty shoots to each root, to grow up for seed, or you will weaken the plants, and they will die in winter. This is the reason why so many vacancies are seen in many asparagus beds. This plant may be forced in hotbeds, so as to yield an abundance of good shoots long before they will start in the open air, affording an early luxury to those who can afford it.

This vegetable is equal or superior to green peas, and by taking all the pains recommended above, in the beginning, an abundance can be raised for twenty years, on the same bed, at a very trifling cost. Early radishes and other vegetables can be raised, between the rows, without any harm to the asparagus.

BALM.

This is a medicinal plant, very useful, and easily raised. A strong infusion of the leaves, drank freely for some time by a nervous, hypochondriacal person, is, perhaps, better than any other medicine. It is also good in flatulency and fevers.

Its *propagation* is by slips or roots. It is perennial, affording a supply for many years. Gather just as the blossoms are appearing, and dry quickly in a slow oven, or in the shade. Press and do up in white papers, and keep in a tight, dry drawer, until needed for use.

BARBERRY.

A prickly shrub, from five to ten feet high, growing wild in this country and in Europe, on poor, hard soils, or in moist situations, by walls, stones, or fences.

Its *propagation* is by seeds, suckers, or offshoots.

This shrub is used for jellies, tarts, pickles, &c. Preserves



Barberries.

made of equal parts of barberry and sweet apples, or outer-part of fine water-melons, are very superior. It is also one of the best shrubs for hedge.

The bark has much of the tannin principle, and with the wood, is used for coloring yellow. Shrub, blossoms, and fruit, are quite ornamental, forming a beautiful hedge, but rather inclined to spread. Will do well on any land and in any situation. The discussion in New England about its blasting contiguous fields of grain, is about as sensible as the old witchcraft mania. Every garden should have two or three.

BARLEY.

Does best on land which was hoed the previous year. If properly tilled, such land is rich, free from weeds, and easily pulverized. Sod, plowed deep in the fall, rolled early in the spring, well harrowed, the seed sown and harrowed in, and all rolled level, will produce a good crop. Two bushels of seed should be sowed on an acre, unless the land be very rich; in that case, one half-bushel less. Essential to a good crop is rain about the time of heading and filling. Hence early sowing is always surest. In many parts of the country it is of little use to sow barley, unless it be gotten in **VERY EARLY**. In not more than one season in twelve can you get a good crop of barley from late sowing in all the middle and western states. Barley is more favorably affected than any other grain, by soaking twenty-four hours before sowing, and mixing with dry ashes. A weak solution of nitre is best for soaking the seed.

Varieties are two, four, and six rowed. The two-rowed grows the tallest, and is most conveniently harvested. It is controverted whether the six-rowed variety yields the largest crop to the acre. If the weather be dry, and the worms attack the young plants, rolling when two or three inches high, with a heavy roller, will save and increase the crop. Rolling is a great help to the harvesting, as it levels the surface.

Harvesting should always be attended to just as it turns, but by all means before the straw becomes dry. If it stands up, cut with cradle or reaper, and bind. If lodged, cut with a scythe, and cure in small cocks like clover.

Standing until very ripe, or lying scattered until quite dry, is very wasteful.

Products are all the way from fifteen to seventy bushels to the acre, according to season and cultivation. Reasonable care will secure an average annual crop of forty-five or fifty bushels per acre, which makes it a profitable crop while the demand continues. It is a good crop for ground feed for all animals, the beards being a little troublesome when fed whole. The straw is one of the very best for animals. Barley requires the use of the land only ninety days, leaving it in good condition for fall-grain.

Used for malting, and for food for men and beasts. It makes handsome flour and good bread. Hulled, it is a better article of food than rice.

It succeeds well on land not stiff and tenacious enough for wheat, or moist and cool enough for oats. If farmers should raise only for malt, the nation would become drunk and poor on beer, and the market would be ruined. But raised as food, it is one of the most profitable agricultural products.

BARNs.

A barn should always front the north. The yard for stock should be on the south side, with tight fences for protection on the east and west. As this is designed for winter use, it is a great saving of comfort to the creatures. The barn-yard should be hollowed out by excavation, until four or five feet lower in the centre than on the edges. The border should be nearly level, inclining slightly toward the centre, to allow the liquid in the yard to run into it for purposes of manure. The front of a barn should be on the summit of a small rise of ground, to allow water to run away from the door, to prevent mud. In hilly countries it is very convenient to build barns by hills, so as to allow hay and grain to be drawn in near the top, and be thrown down, instead of being pitched up. These general principles are sufficient for all ordinary barns. Those who are able to build expensive barns had better build them circular, eight or sixteen square, and one hundred feet in diameter—the lower part, to top of stable, of stone. Let the stable extend all around next to the wall, and a floor over the stable, that teams may be driven all around to pitch into the bays, and upon the mows and scaffolds, at every point. Thus teams may go round and out the door at which they entered. Such a floor will accommodate several teams at the same time. The cellar should be in the centre, surrounded

by the stable. Such a cellar would never freeze, and would hold roots enough for one hundred head of cattle, which the stable would easily accommodate. Let the mangers be around next the cellar, for convenience of feeding. Such a barn would be more convenient for a dairy of one hundred cows, or for winter-fattening of cattle, than any other form. It would cost no more than many barns in western New York that are not half as convenient.

BEANS.

These are divided into two classes—pole and bush beans. They are subdivided into many varieties. We omit the English, or horse-bean, as being less valuable, for any purpose, than our well-known beans or peas. Pole beans are troublesome to raise, and are only grown on account of excellence of quality, and to have successive gatherings from the same vines. Pole beans are only used for horticultural purposes.

Field-Beans.—For general culture there are three varieties of white—small, medium, and large. Of all known beans, we prefer the medium white. The China bean, white with a red face, is an early variety. All ripen nearly at the same time. It cooks almost as soon as a potato, and is good for the table; but it is less productive, and less saleable because not wholly white. For planting among corn, as for a very late crop, this bean is valuable, because it matures in so short a time. Good beans may be raised among corn, without injury to the corn-crop. This can only be done when it is designed to cultivate the corn but one way. Many fail in attempts to grow beans among corn, by planting them at first hoeing. The corn, having so much the start, will shade the beans and nearly destroy them. But plant at the same time of the corn, and they will mature before the corn will shade them much, and not be in the way even of the ordinary crop of pumpkins. But double-cropping land in this way, at any time, is of very doubtful utility. A separate plat of ground for each crop, in nearly all cases, is the most economical. To raise a good crop of beans, prepare the soil as thoroughly as for any other crop. Beans will mature on land so poor and hard as to be almost worthless for other crops. But a rich, mellow soil is as good for beans as anything else, though not so indispensable. Drill in with a planter as near together as possible, and allow a cultivator to pass between them. One bushel to the acre on ordinary land, and three fourths of a bushel on very rich land, is about the quantity of seed

requisite. Hoe and cultivate them while young. Late cultivation is useless—more so than on most other crops. Beans should not be much hilled in hoeing, and should never be worked when wet. All plants with a rough stalk, like the bean, potato, and vine, are greatly injured, sometimes ruined, by having the earth stirred around them when they are wet, or even damp. Beans are usually pulled; this should be done when the latest pods are full-grown, but not dry. Place them in small bunches on the ground with the roots up. If the weather be dry, they need not be moved until time to draw them in. If the weather be damp, they should be stacked loosely in small stacks around poles, and covered with straw on the top, to shed rain. Always haul in when very dry. Avoid stacking if possible, for they are always wasted rapidly by moving. In drawing in, keep the rack under them covered with blankets to save those that shell.

In pulling beans, be sure and take hold below the pods, otherwise the pods will crack; and although no harm appears then to be done, yet, when they dry, every pod that has been squeezed by pulling, will turn wrong side out, and the contents be wasted. If your beans are part ripe and the remainder green, and it is necessary to pull them to save the early ones, or guard against frost, when the ripe ones are dry, thrash them lightly. This will shell all the ripe ones, and none of the green ones. Put the straw upon a scaffold and thrash again in winter. Thus you will save all, and have beautiful beans. Bean-straw should always be kept dry for sheep in winter; it is equal to hay.

Garden-Beans.—There are many varieties, a few of which only should be cultivated. Having the best, there is no object in raising an inferior quality.

The best early string-bean is the Early Mohawk; it will stand a pretty smart spring-frost without injury; comes early, and is good. Early Yellow, Early Black, and Quaker, or dun-colored, are also early and good.

Refugee, or Thousand-to-one, are the best string-beans known; have a round, crisp, full, succulent pod; come as soon as the Mohawks are out of the way; and are very productive. Planted in August, they are excellent until frost; the very best for pickling. For an early shell-bean we recommend the China red-face; the white kidney and numerous other varieties are less certain and productive.

Running Beans are numerous. The true Lima, very large, greenish, when ripe

and dry, is the richest bean known; is nearly as good in winter, cooked in the same way, as when shelled green. They are very productive, continuing in blossom till killed by frost. In warm countries they grow for years, making a tree, or growing like a large grapevine.

The London Horticultural—called also Speckled Cranberry, and Wild Goose—is a very rich variety. The only objection is the difficulty of shelling; one only can be removed at once, because of the tenderness of the pod. The Carolina or butter bean often passes for the Lima. It has similar pods, the bean is of similar shape, but always white, instead of greenish like the Lima, and smaller, earlier, and of inferior quality. The Scarlet Runner, formerly only grown as an ornament on account of its great profusion of scarlet blossoms continuing until frost, is a very productive variety; pods very large and very succulent, making an excellent string-bean; a rich variety when dry, but objectionable on account of their dark color. The Red and the White Cranberries, Dutch Caseknife, and many other varieties, have good qualities, but are inferior to those mentioned above. Beans may be forwarded in hotbeds, by planting on sods six inches square, put bottom-up on the hotbed, and covered with fine mould; plant four beans on each sod; when frost is gone, remove the sod in the hill beside the pole, previously set, leave only two pole-beans to grow in a hill; they will always produce more than a greater number. A shrub six feet high, with the branches on, is better than a pole for any running bean; nearly twice as many will grow on a bush as on a pole. Use a crowbar for setting poles, or drive a stake down first, and set poles very deep, or they will blow down and destroy the beans.

BEEES AND BEEHIVES.

The study of the honey-bee has been pursued with interest from remote ages. A work on bees, by De Montfort, published at Antwerp in 1649, estimates the number of treatises on this subject, before his time, at between five and six hundred. As that was two hundred and eight years ago, the number has probably increased to two thousand or more. We have some knowledge of the character of these early works, as far back as Democritus, four hundred and sixty years before the Christian era. The great men of antiquity gave particular attention to study and writing on the honey-bee.—Among them we notice Aristotle, Plato, Columella, Pliny, and Virgil. At a later period, we

have Huber, Swammerdam, Warder, Wildman, &c. In our own day, we have Huish, Miner, Quinby, Weeks, Richardson, Langstroth, and a host of others. For the first two thousand years from the date of these works, the bee was treated mainly as a curious insect, rather than as a source of profit and luxury to man. And although Palestine was eulogized as a land flowing with milk and honey, before the Hebrews took possession of it, yet the science of *bee-culture* was wholly unknown.

In the earliest attention to bees, they were supposed to originate in the concentrated aroma of the sweetest and most beautiful flowers. Virgil, and others of his time, supposed them to come from the carcasses of dead animals. But the remarkable experiments of Huber, sixty years ago, developed many facts respecting their origin and economy. Subsequent observers have added still more to the stock of our knowledge respecting these wonderful creatures. The different stages of growth, from the minute egg of the queen to a full grown bee, and the precise time occupied by each, are well established. The three classes of bees, in every perfect colony, and the offices of each; their mechanical skill in constructing the different sized and shaped cells, for honey, for raising drones, workers, and queens, all differing according to the purposes for which they are intended; the wars of the queens, and their sovereignty over their respective colonies; the methods by which working-bees will raise a young queen, when the old one is destroyed, out of the larvae of common bees; the peculiar construction and situation of the queen cells; and, above all, the royal jelly (differing from everything else in the hive) which they manufacture for the food of young queens; the manner in which they ventilate their hives by a swift motion of their wings, causing the buzzing noise they make in a summer evening; their method of repairing broken comb, and building fortifications, before their entrances, at certain times, to keep out the sphinx—all these curious matters are treated fully in many of our works on bees. But we must forego the pleasure of presenting these at length, it being our sole object to enable all who follow our directions, so to manage bees as to render them profitable. In preparing the brief directions that follow, we have most carefully studied all the works, American and foreign, to which we could get access. Between this article and the best of those works there will be found a general agreement, except as it respects beehives. We present views of hives, that we are not aware have ever been written. The original idea, or new principle (which

consists in constructing the hive with the entrance near the top), was suggested to us by Samuel Pierce, Esq., of Troy, N. Y., who is the great American inventor of cooking-ranges and stoves. We have carefully considered the principle in its various relations to the habits of the bee, and believe it correct. To most of our late works on honey-bees we have one serious objection: it is, that they bear on their face the evidence of having been written to make money, by promoting the sale of some patent hive. These works all have a little in common that is interesting; the remainder seems designed to oppose some former patent and commend a new one. They thus swell their volumes to a troublesome and expensive size, with that which is of no use to practical men. A work made to fight a patent, or to sell one, can not be reliable. The requisites to successful bee-management are the following:—

1. Always have large, strong swarms. Such only are able successfully to contend with their enemies. This is done by uniting weak swarms, or sending back a young, feeble swarm when it comes out (as herein after directed).
2. Use medium-sized hives. In too large hives, bees find it difficult to guard their territories. They also store up more honey than they need, and yield less to the cultivator. The main box should be one foot square by fifteen inches high. Make hives of new boards; plane smooth and paint white on the outside. The usual direction is to leave the inside rough, to aid in holding up the honey, but to plane the inside edges so as to make close joints. We counsel to plane the inside of the hive smooth, and draw a fine saw lightly length wise of the boards, to make the comb adhere. This will be a great saving of the time of bees, when it is worth the most in gathering honey. They always carry out all the sawdust from the inside of their hives. Better save their time by planing it off.
3. To prevent robberies among bees, when a weak colony is attacked, close their entrances so that but one bee can pass at once, and they will then take care of themselves. To prevent a disposition to pillage, place all your hives in actual contact, on the sides, and make a communication between them, but not large enough to allow bees to pass. This will give the same scent to the whole, and make them feel like one family. Bees distinguish strangers only by the smell: hence, so connected, they will not quarrel or pillage.

4. Comb is usually regarded better for not being more than two or three years old. The usual theory is, that cells fill up by repeated use, and, becoming smaller, render the bees raised in them diminutive. This is not probable, as a known habit of the bee is to clean out the cells before reusing them. Huber demonstrated that bees raised in drone-cells (which are always larger than for workers) grew no larger than in their own natural cells. And as bees build their cells the right size at first, it is probable they keep them so. Quinby assures us that bees have been grown twenty years in the same comb, and that the last were as large as the first. But for other reasons, it is better to change the comb. In all ordinary cases, it is better to transfer the swarm to a new hive every third year. Many think it best to use hives composed of three sections, seven and a half inches deep each, screwed together with strips of wood on the sides, and the top screwed on that it may easily be removed; thick paper or muslin should be pasted around, on the places of intersection, to guard against enemies; the two lower sections only allowed to contain bees—the upper one being designed for the honey-boxes, to be removed. Each spring, after two years old, the lower section is taken out and a new one put on the top, the cover of the old one having been first removed. This is the old "pyramidal beehive," which is the title of a treatise on bees, by P. Ducouedic, translated from the French and abridged by Silas Dinsmore in 1829. This has recently been revived and patented as a new thing. We think with Quinby, that these hives are too expensive and too complicated, and that the great mass of cultivators will succeed best with hives of simple construction.

5. Allowing bees to swarm in their own time and way is better than all artificial multiplication of colonies. If there are no small trees near the apiary, place bushes, upon which the bees will usually light, when they come out. If they seem determined to go away without lighting, throw sand or dust among them; this produces confusion, and causes them to settle near. The practice of ringing bells and drumming on tin, &c., is usually ridiculed; but we believe it to be useful, and that on philosophic principles. The object to be secured is to confuse the swarm and drown the voice of the queen. The bees move only with their queen; hence, if anything prevents them from hearing her, confusion follows, and the swarm lights: therefore, any noise among them may answer the purpose, and save the swarm.

To hive bees, place them on a clean white cloth, and set the hive over them, raised an inch or two by blocks under the corners. It is said that a little

sweetened water or honey, applied to the inside of the hive, will incline the bees to remain. The best preparation is to fasten a piece of new white comb on the top of the inside of the hive. This is done by dipping the end of a piece of comb in melted beeswax, and sticking it to the top. Bees should never be allowed to send off more than two colonies in one season. To restrict them to one is still better. Excessive swarming is a precursor of destruction, rather than an evidence (as usually regarded) of prosperity. A given number of bees will make far less honey in two hives than in one, unless they are so numerous as greatly to crowd the hive. When a late swarm comes out, take away the queen, and they will immediately return. Any one may easily find the queen: she is always in the centre of the bunch into which the swarm collects on lighting. If they form two or three clusters, it is because they have that number of queens. Then all the queens should be destroyed. The following cuts of the three classes of bees will enable one to distinguish the queen.



Working Bee. Queen. Drone.

The queen is sometimes, but not always, larger than the common bee; but her

body is always longer, and blackish above and yellowish underneath.

To unite any two swarms together, turn the hive you wish to empty bottom-up, and place the one into which you would have them go on the top of the other, with their mouths together; then tie a cloth around, at the place of intersection, to prevent the egress of the bees. Gently rap the lower hive on all sides, near the bottom, gradually rising until you reach the top of the lower hive, and all the bees will go into the upper one.

In the same way, it is easy to remove a colony into a new hive, whenever you think they need changing. This should be performed in the dusk of the evening, and need occupy no more than half an hour. The hive should then be put in its place. Uniting weak new swarms, may be done whenever they come out; but changing a swarm from an old hive to a new one should be performed as early as the middle of June. If moths get in, change hives at any time when it is warm enough for bees to work, and give them all the honey in their old hive. If you discover moths too late for the bees to build comb in a new hive, take the queen from the hive infested with moths, and place it where the bees will unite with another colony, and feed them all the honey from the deserted hive. This, or the destruction of the bees and saving the honey, is always necessary, when moth-worms are in possession, unless they are so near the bottom, that all the comb around them may be cut out. Bees are fond of salt. Always keep some on a board near them.

They also need water. If a rivulet runs near the apiary, it is well. If not, place water in shallow pans, with pebbles in them, on which the bees can stand to drink. Change the water daily. It is too late to speak of the improvidence of killing bees, to get their honey. Use boxes of any size or construction you choose. In common hives, boxes should be attached to the sides, and not placed on the top. It is a wasteful tax upon the time and strength of loaded bees, to make them travel through the whole length of the hive, into boxes on the top. Place boxes as near as possible to their entrance or below that entrance. Bees should be kept out of the boxes until they have pretty well filled the hive, or they may begin to raise young bees in the boxes.

Wintering bees successfully, is one of the most difficult matters in bee-culture. Two evils are to be guarded against, dampness and suffocation. Excessive dampness, sometimes causes frost about the entrance that fills it up

and suffocation ensues. Sometimes snow falls, or is blown over the entrance, and the bees die in a few hours for the want of air. Many large colonies, with plenty of honey, are thus destroyed. Dampness is very injurious to bees on other accounts. In a good bee-house there is no danger from snow, and little from dampness. Bees, not having honey enough for winter, should be fed in pleasant fall weather, after they have nearly completed the labors of the season. Weighing hives is unnecessary. A moderate degree of judgment will determine whether a swarm has a sufficient store for winter. If not, feed them. Never give bees dry sugar. They take up their food, as an elephant does water in his trunk; it, therefore, should be in a liquid form. Boil good sugar for ten minutes in ale or beer, leaving it about as thick as honey. Put it in a feed trough; which should be flat-bottomed.

Fasten together thin slats, one fourth of an inch apart, so as to fit the inside of the feed trough and lie on the surface of the liquid, so as to rise and fall with it. Put this in a box and attach it to the hive, as for taking box-honey, and the bees will work it all up. Put out-door, it tempts other bees, and may lead to quarrels, and robbery.

It is not generally known, that a good swarm of bees may be destroyed, by feeding them plenty of honey, early in the spring. They carry it in and fill up their empty cells and leave no room for raising young bees; hence the whole is ruined for want of inhabitants, to take the places of those that get destroyed, or die of age.

To winter bees well, utterly exclude the light during all the cold weather, until it becomes so warm, that they will not get so chilled when out that they can not return. Intense cold is not injurious to bees, provided they are kept in the hive and are dry. A large swarm, will not eat two pounds of honey during the whole cold winter, if kept from the light. When tempted out, every warm day they come into the sunshine and empty themselves, and return to consume large quantities of honey. Kept in the dark, they are nearly torpid, eat but a mere trifle, and winter well. Whatever your hive or house, then, keep your bees entirely from the light, in cold weather. This is the only reason why bees keep so well in a dark dry cellar, or buried in the ground, with something around them, to preserve them from moisture, and a conductor through the surface, to admit fresh air. It is not because it keeps out the cold, but because it excludes the light, and renders the bees inactive.

Gilmore's patent bee-house, is a great improvement on this account.

Of the diseases of bees, such as dysentery, &c., we shall not treat. All that can profitably be done, to remedy these evils, is secured by salt, water, and properly-prepared food, as given above.

But the great question in bee-culture is, How to prevent the depredation of the wax-moth? To this subject, much study has been given, and respecting it many theories have been advanced. The following suggestions are, to us, the most satisfactory. The miller, that deposits the egg, which soon changes to the worm, so destructive in the beehive, commences to fly about, at dark. In almost every country-house, they are seen about the lights in the evening. They are still during all the day. They are remarkably attracted by lights in the evening. Hence our first rule:—

1. Place a teasaucer of melted lard or oil, with a piece of cotton flannel for a wick, in or near the apiary at dusk; light it and allow it to burn till near morning, expiring before daylight. This done every night during the month of June, will be very effectual.
2. Keep grass and weeds away from the immediate vicinity of your apiary. Let the ground be kept clean and smooth. This destroys many of the hiding-places of the miller, and forces him away to spend the day. This precaution has many other advantages.
3. Keep large strong colonies. They will be able to guard their territories, and contend with this and all other enemies.
4. Never have any opening in a beehive near the bottom, during the season of millers (see Beehive). Let the openings be so small, that only one or two bees can pass at once. To accommodate the bees, increase the number of openings. Millers will seldom enter among a strong swarm, with such openings. All around the bottom, it should be so tight, that no crevice can be found, in which a miller can deposit an egg. Better plaster around, closely, with some substance, the place of contact between the hive and the board on which it stands, and keep it entirely tight during the time in which the millers are active.
5. If, through negligence, worms have got into a hive, examine it at once; and if they are near the bottom only, within sight and reach, cut out the comb

around them, and remove them from the hive. If this is not practicable, transfer the swarm to a new hive, or unite it with another, without delay.

6. The great remedy for the moth is in the right construction of a BEEHIVE.

Whatever the form of the hive you use, have the entrance within three or four inches of the top. Millers are afraid of bees; they will not go among them, unless they are in a weak, dispirited condition. They steal into the hive when the bees are quiet, up among the comb, or when they hang out in warm weather, but are still and quiet. If the hive be open on all sides (as is so often recommended), the miller enters on some side where the bees are not. Now bees are apt to go to the upper part of the hive and comb, and leave the lower part and entrance exposed. If the entrance be at the upper part, the bees will fill it and be all about it. A bee can easily pass through a cluster of bees, and enter or leave a hive; but a miller will never undertake it: this, then, will be a perfect safeguard against the depredations of the moth. This hive is better on every account. Moisture rises: in a hive open only at the bottom, it is likely to rise to the top of the hive and injure the bees; with the opening near the top it easily escapes. The objection that would be soonest raised to this suggestion is, that bees need a good circulation of fresh air, and such a hive would not favor it. To this we reply, a hive open near the top secures the best possible air to the swarm; any foul air has opportunity freely to escape. That peculiar humming heard in a hive in hot weather is produced by a certain motion of the wings of the bees, designed to expel vitiated air, and admit the pure, by keeping up a current. In the daytime, when the weather is hot, you will see a few bees near the entrance on the outside, and hear others within, performing this service, and, when fatigued, others take their place. This is one of the most wonderful things in all the habits and instincts of bees. They thus keep a pure atmosphere in a crowded hive in hot weather. Now, it would require much less fanning to expel bad air from a hive open at the top, than from one where all that air had to be forced down, through an opening at the bottom. This theory is sustained by the natural habits of bees in their wild state. Wild bees, that select their own abodes, are found in trees and crevices of rocks. They usually build their combs *downward* from their entrance, and their abode is air-tight at the bottom; they have no air only what is admitted at their entrance, near the top of their dwelling, and with no current of air only what they choose to produce by fanning. The purest atmosphere in any room is where it enters and passes out at the top; in such a room only does the

external atmosphere circulate naturally. It is on the same principle that bees keep better buried than in any other way, provided only they are kept dry. Yet they are in a place air-tight, except the small conductor to the atmosphere above them. The old "pyramidal beehive" of Ducouedic, with three sections, one above the other, allowing the removal of the lower one each spring, and the placing of a new one on the top—thus changing the comb, so that none shall ever be more than two years old, with the opening always within three or four inches of the top, is the best of the patent hives. We prefer plain, simple hives. The general adoption of this principle, whatever hives are used, would be a new era in the science of bee-culture. No beehive should ever be exposed to the direct rays of the sun in a beehouse. A hive standing alone, with a free circulation of air on every side, will not be seriously injured by the sun. But when the rays are intercepted by walls or boards, in the rear and on the sides, they are very disastrous. Other hints, such as clearing off occasionally, in all seasons except in the cold of winter, the bottom board, &c., are matters upon which we need not dwell. No cultivator would think of neglecting them. Let no one be alarmed at finding dead bees on the bottom when clearing out a hive; bees live only from five to seven months, and their places are then supplied with young ones. The above suggestions followed, and a little care taken in cultivating the fruits, grains, and grasses, that yield the best flowers for bees, *would secure uniform success* in raising honey. This is one of the finest luxuries; and, what is a great desideratum, it is within the easy reach of every poor family, even, in all the rural districts of the land.

Good honey, good vegetables, and good fruit, like rain and sunshine, may be the property of all. The design of this volume is to enable the poor and the unlearned to enjoy these things in abundance, with only that amount of care and labor necessary to give them a zest.

BEETS.

Of this excellent root there are quite a number of varieties. Mangel-Wurtzel yields most for field-culture, and is the great beet for feeding to domestic animals; not generally used for the table. French Sugar or Amber Beet is good for field-culture, both in quality and yield; but it is not equal to the Wurtzel. Yellow-Turnip-rooted, Early Blood-Turnip-rooted, Early Dwarf Blood, Early White Scarcity, and Long Blood, are among the leading garden

varieties. Of all the beets, three only need be cultivated in this country—the Wurtzel for feeding, and the Early Blood Turnip-rooted and Long Blood for the table. The Early Blood is the best through the whole season, comes early, and can be easily kept so as to be good for the table in the spring. The Long Blood is later, and very much esteemed. Beets may be easily forwarded in hotbeds. Sow seed early, and transplant in garden as soon as the soil is warm enough to promote their growth. When well done, the removal retards their growth but little.

Young beets are universally esteemed. To have them of excellent quality during all the winter, it is only necessary to plant on the last days of July. If the weather be dry, water well, so as to get them up, and they will attain the size and age at which they are most valued. Keep them in the cellar for use, as other beets. They will keep as well as old ones.

Field-Culture.—Make the soil very mellow, fifteen to eighteen inches deep. Soil having a little sand in its composition is always best. Even very sandy land is good if it be sufficiently enriched. Choose land on which water will not stand in a wet season. Beets endure drought better than extreme wet. Having made the surface perfectly mellow, and free from clods, weeds, and stones, sow in drills, with a machine for the purpose, two feet apart. This is wide enough for a small cultivator to pass between them. After planting, roll the surface smooth and level; this will greatly facilitate early cultivation. On a rough surface you can not cultivate small plants without destroying many of them; hence the necessity of straight rows and thorough rolling. The English books recommend planting this and other roots on ridges: for their climate it is good, but for ours it is bad. They have to guard against too much moisture, and we against drought; hence, they should plant on ridges, and we on an even surface. To get the largest crop, plow a deep furrow for each row, put in plenty of good manure, cover it with the plow and level the surface, and plant over the manure. When well growing, they should be thinned to six or eight inches in the row. Often stirring the earth while they are young is of great benefit. The quality and quantity of a root-crop depend much upon the rapidity of its growth. Slow growth gives harder roots of worse flavor, as well as a stinted crop.

Harvesting should be done just before severe frosts. They will grow until frost comes, however early they were planted, or whatever size they may

have attained. They grow as rapidly after light frosts as at any time in the season; but very severe frosts expose them to rot during winter.

Preserving for table use is usually done by putting in boxes with moist sand, or the mould in which they grew. This excludes air, and, if kept a little moist, will preserve them perfectly. Roots are always better buried below frost out-door on a dry knoll, where water will not stand in the pits. But in cold climates it is necessary to have some in the cellar for winter use. The common method of burying beets, and turnips, and all other roots out-door, is well understood. The only requisites are, a dry location secured from frost, straw next the roots, a covering of earth, not too deep while the weather is yet mild; as it grows cold, put on another covering of straw, and over it a foot of earth; as it becomes very cold, put on a load or two of barnyard manure: this will save them beyond the power of the coldest winter. Vast quantities of roots buried outdoor are destroyed annually by frost, and there is no need of ever losing a bushel. You "*thought* they would not freeze," is not half as good as spending two hours' time in covering, so that you *know* they can not freeze. There is hardly a more provoking piece of carelessness, in the whole range of domestic economy, than the needless loss of so many edible roots by frost.

The table use of beets is everywhere known; their value for feeding animals is not duly appreciated in this country. No one who keeps domestic animals or fowls should fail to raise a beet-crop; it is one of the surest crops grown; it is never destroyed by insects, and drought affects it but very little. On good soil, beets produce an enormous weight to the acre. The lower leaves may be stripped off twice during the season, to feed to cows or other stock, without injury to the crop. Cows will give more milk for fifteen days, fed on this root alone, than on any other feed; they then begin to get too fat, and decline in milk: hence, they should be fed beets and hay or other food in about equal parts, on which they will do better than in any other way. Horses do better on equal parts of beet and hay than on ordinary hay and grain. Horses fed thus will fatten, needing only the addition of a little ground grain, when working hard. Plenty of beets, with a little other food, makes cows give milk as well as in summer. Raw beets cut fine, with a little milk, will fatten hogs as fast as boiled potatoes. All fowls are fond of them, chopped fine and mixed with other food. Sheep, also, are fond of them. They are very valuable to ewes in the spring when lambs come, when they especially need succulent food. The

free use of this root by English farmers is an important reason of their great success in raising fine sheep and lambs. They promote the health of animals, and none ever tire of them. As it needs no cooking, it is the cheapest food of the root kind. Beets will keep longer, and in better condition, than any other root. They never give any disagreeable flavor to milk. It is considered established, now, that four pounds of beet equal in nourishment five pounds of carrot. Every large feeder should have a cellar beyond the reach of frosts, and of large dimensions, accessible at all times, in which to keep his roots. These beets should be piled up there as cord-wood, to give a free circulation of the air.

In Germany, the beet-crop takes the place of much of their meadows, at a great saving of expense, producing remarkably fine horses, and fattening immense herds of cattle, which they export to France. We insist upon the importance of a beet-crop to every man who owns an acre of land and a few domestic animals, or only a cow and a few fowls.

BENE PLANT.

Introduced into the Southern states by negroes from Africa. They boil a handful of the seed with their allowance of Indian corn. It yields a larger proportion than any other plant of an excellent oil. It is extensively cultivated in Egypt as food for horses, and for culinary purposes. It is remarkable that this native of a southern clime should flourish well, as it does, in the Northern states. It should be cultivated throughout the North as a medicinal herb.

A Virginia gentleman gave Thorburn & Son, seed-dealers of New York, the following account of its virtues: a few green leaves of the plant, plunged a few times in a tumbler of cold water, made it like a thin jelly, without taste or color. Children afflicted with summer-complaint drink it freely, and it is thought to be the best remedy for that disease ever discovered; it is believed that three thousand children were saved by it in Baltimore the first summer after its introduction. Plant in April, in the middle states, about two feet apart. When half grown, break off the plants, to increase the quantity of leaves. We recommend to all families to raise it, and try its virtues, under the advice of their family physicians.

BIRDS.

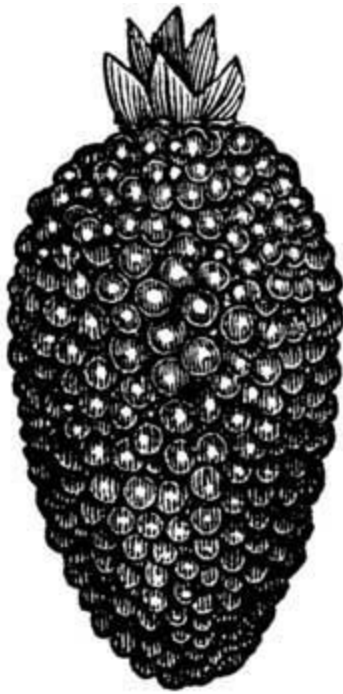
These are exceedingly useful in destroying insects. So of toads and bats. No one should ever be wantonly killed. Boys, old or young, should never be allowed to shoot birds, or disturb their nests, only as they would domestic fowls, for actual use. A wanton recklessness is exhibited about our cities and villages, in killing off small birds, that are of no use after they are dead. Living, they are valuable to every garden and fruit-orchard. In every state, stringent laws should be made and enforced against their destruction. Even the crow, without friends as he is, is a real blessing to the farmer: keep him from the young corn for a few days, as it is easy to do, and, all the rest of the year, his destruction of worms and insects is a great blessing. Birds, therefore, should be baited, fed, and tamed, as much as possible, to encourage them to feel at home on our premises. Having protected our small fruits, they claim a share, and they have not always a just view of the rights of property, nor do they always exhibit good judgment in dividing it. It is best to buy them off by feeding them with something else. If they still prefer the fruit, hang little bells in the trees, where they will make a noise; or hang pieces of tin, old looking-glass, or even shingles, by strings, so that they will keep in motion, and the birds will keep away. Images standing still are useless, as the birds often build nests in the pockets.

BLACKBERRY.

This berry grows wild, in great abundance, in many parts of the country. It has been so plentiful, especially in the newer parts, that its cultivation has not been much attended to until recently. Like all other berries, the cultivated bear the largest and best fruit.

Uses.—It is one of the finest desert berries; excellent in milk, and for tarts, pies, &c. Blackberries make the best vinegar for table use, and a wine that retains the peculiar flavor, and of a beautiful color.

This berry comes in after the raspberries, and ripens long in succession on the same bush.



High-bush Blackberry.

Varieties of wild ones, usually found growing in the borders of fields and woods, are the low-bush and the high-bush. Downing gives the first place to the low. Our experience is, that the high is the best bearer of the best fruit. We have often gathered them one and one fourth inches in length, very black, and of delicious sweetness. The low ones that have come under our observation have been smaller and nearer round, and not nearly so sweet.

The best cultivated varieties are—

THE DORCHESTER—Introduced from Massachusetts, and a vigorous, large, regular bearer.

LAWTON, OR NEW ROCHELLE.—This is the great blackberry of this country, by the side of which, no other, yet known, need be cultivated. It is a very hardy, great grower. It is an enormous bearer of

such fruit that it commands thirty cents per quart, when other blackberries sell for ten. On a rather moist, heavy loam, and especially in the shade, its productions are truly wonderful. Continues to ripen daily for six weeks.

Propagation is by offshoots from the old roots, or by seeds. When by seeds, they should be planted in mellow soil, and where the sun will not shine on them between eight and five o'clock in hot weather. In transplanting, much care is requisite. The bark of the roots is like evergreens, very tender and easily broken, or injured by exposure to the atmosphere; hence, take up carefully, and keep covered from sun and air until transplanted. This is destined to become one of the universally-cultivated small fruits—as much so as the strawberry. The best manures are, wood-ashes, leaves, decayed wood, and all kinds of coarse litter, with stable manure well incorporated with the soil, before transplanting. Animal manure should not be very plentifully applied.

We have seen in Illinois a vigorous bush, and apparently good bearer, of perfect fruit—a variety called *white blackberry*. The fruit was greenish and pleasant to the taste.

BLACK RASPBERRY.

The common wild, found by fences, especially in the margin of forests, in most parts of the United States, is very valuable for cultivation in gardens. Coming in after the red raspberry, and ripening in succession until the blackberry commences, it is highly esteemed. Cultivated with little animal manure, but plenty of sawdust, tan-bark, old leaves, wood, chips, and coarse litter, it improves very much from its wild state. Fruit is all borne on bushes of the previous year's growth; hence, after they have done bearing, cut away the old bushes. To secure the greatest yield on rich land, cut off the tops of the shoots rising for next year's fruit, when they are four or five feet high. The result will be, strong shoots from behind all the leaves on the upper part of the stalk, each of which will bear nearly as much fruit as would the whole have done without clipping. A dozen of these would occupy but a small place in a border, or by a wall. Not an American garden should be found without them.

BONES.

Bones are one of the most valuable manures. They yield the phosphates in large measure. On all land needing lime, they are very valuable. The heads, &c., about butchers' shops will bear a transportation of twenty miles to put upon meadows. Break them with the head of an axe, and pound them into the sod, even with the surface. They add greatly to the products of a meadow. Ground, they make one of the best manures of commerce. A cheap method for the farmer is to deposite a load of horse-manure, and on that a load of bones, and alternate each, till he has used up all his bones. Cover the last load of bones deep with manure. It will make a splendid hotbed, and the fermentation of the manure will dissolve or pulverize the bones, and the heap will become one mass of the most valuable manure, especially for roots and vines, and all vegetables requiring a rich, fine manure.

BORECOLE, OR KALE.

There are some fifteen or twenty kinds cultivated in Europe. Two only, the green and the brown, are desirable in this country. Cultivate as cabbage. In

portions of the middle states they will stand the frosts of winter well, without much protection; further north, they need protection with a little brush and straw during severe frosts. Those grown on rather hard land are better for winter; being less succulent, they endure cold better. Cut them off for use whenever you choose. They do not head like cabbage; they have full bunches of curled leaves. Cut off so as to include all, not over eight inches long. In winter, after having been pretty well exposed to the frost, they are very fine. Set out the stumps early in spring, and they will yield a profusion of delicious sprouts. This would be a valuable addition to many of our kitchen gardens.

BROCCOLI.

This may be regarded as a late flowering species of cauliflower. It should be planted and treated as cabbage, and fine heads will be formed, in the middle states, in October: at the South much earlier, according to latitude. Take up in November, and preserve as cabbage, and good ones may be had in winter. To prevent ravages of insects, mix ashes in the soil when transplanting, or fresh loam or earth from a new field; or trench deep, so as to throw up several inches of subsoil, which had not before been disturbed.

To save seed, transplant some of the best in spring; break off all the lower sprouts, allowing only a few of the best centre ones to grow. Tie them to stakes, to prevent destruction by storms. Be sure to have nothing else of the cabbage kind near your seed broccoli.

BROOM CORN.

Cultivated like other corn, only that this is more generally planted in drills. Three feet apart, and six inches in the drill, it yields more weight of better corn to the acre than to have it nearer. The great fault in raising this crop is getting it too thick. The finest-looking brush is of corn cut while yet so green that the seed is useless. But the brush is stronger, and will make better brooms for wear, when the corn is allowed to stand until the seed is hard, though not till the brush is dry. The land should be rich. This is a hard, exhausting crop for the soil. To harvest, bend down, two feet from the ground, two rows, allowing them so to fall across each other as to expose all the heads. Cut off the heads, with six or eight inches of the stalk, and place

them on top of the bent rows to dry. In a week, in dry weather, they will be well cured, and should be then spread thin, under cover, in plenty of air. There is no worse article to heat and mould. In large crops, they usually take off the seed before curing; it is much lighter to handle, and less bulky. It may be done then, or in winter, as you prefer. The seed is removed on a cylinder eighteen inches long, and two and a half feet in diameter, having two hundred wrought nails with their points projecting. It is turned by a crank, like a fanning mill. The corn is held in a convenient handful, like flax on a hatchel. Where large quantities are to be cleaned of the seed, power is used to turn the machine. Ground or boiled, the seed makes good feed for most animals. Dry, it has too hard a shell. Fowls, with access to plenty of gravel, do well on it. Broom-corn is not a very profitable crop, except to those who manufacture their own corn into brooms. There is much labor about it, and considerable hazard of injuring the crop, by the inexperienced; hence, young farmers had, generally, better let it alone. There are two varieties—they may be forms of growth, from peculiar habits of culture—one, short, with a large, stiff brush running up through the middle, with short branches to the top, called pine-top: it is of no value;—the other is a long, fine brush, the middle being no coarser than the outside. It should be planted with a seed-drill, to make the rows straight and narrow for the convenience of cultivation. Harrowing with a span of horses, with a V drag, one front tooth out, as soon as the corn is up, is beneficial to the crop.

BRUSSELS SPROUTS.

This is a species of cabbage. A long stem runs up, on which grow numerous cabbage-heads in miniature. The centre head is small and of little use, and the large leaves drop off early. It will grow among almost anything else, without injury to either. It is raised from seed like cabbage, and cultivated in all respects the same. Eighteen inches apart each way is a proper distance, as the plant spreads but little. Good, either as a cabbage, or when very small, as greens. They are good even after very hard frosts. By forwarding in hotbed in the spring, and by planting late ones for winter, they may be had most of the year. If they are disposed to run to seed too early, it may be prevented by pulling up, and setting out again in the shade. Save seed as from cabbage, but use great caution that they are not near enough to receive the farina from any

of the rest of the cabbage-tribe.

BUCKTHORN.

This is the most valuable of the thorn tribe, for hedge, in this country. It never suffers from those enemies that destroy so much of the hawthorn. This is also used for dyeing and for medicine.

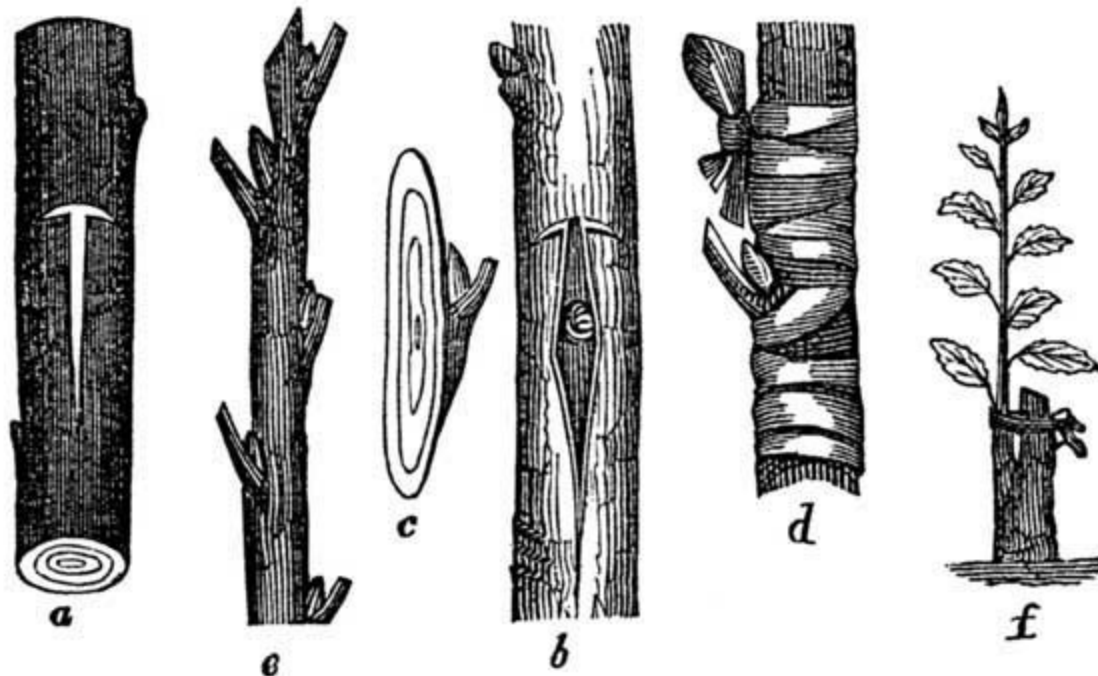
BUCKWHEAT.

This will grow well on almost any soil; even that too poor for most other crops will yield very good buckwheat—though rich land is better for this, as for all other crops. The heat of summer is apt to blast it when filling; hence, in the middle states, it is not best to sow it until into July. It fills well in cool, moist weather, and is quite a sure crop if sowed at the right time. On poor land, one bushel of seed is required for an acre, while half a bushel is sufficient on rich land, where stalks grow large.

The blossoms yield to the honey-bee very large quantities of honey, much inferior to that made of white clover; it may be readily distinguished in the comb by its dark color and peculiar flavor. Ground, it is good for most animals, and for fowls unground, mixed with other grain. It remains long in land; but it is a weed easily killed with the hoe; or a farmer may set apart a small field for an annual crop, keeping up the land by the application of three pecks of plaster per acre each year. It is very popular as human food, and always made into pancakes. The free use of it is said to promote eruptive diseases. The India buckwheat is more productive, but of poorer quality. The bran is the best article known to mix with horse-manure and spade into radish beds, to promote growth and kill worms.

BUDDING.

This is usually given under the article on peaches. But, as it is a general subject, it should be in a separate article, reserving what is peculiar to the different fruits to be noticed under their respective heads.



Budding.

Budding small trees should usually be performed very near the ground, and on a smooth place. Any sharp pocket-knife will do; but a regular budding knife, now for sale in most hardware-stores, is preferable. Cut through the bark in the form of a horizontal crescent (*a* in the cut). Split the bark down from the cut three fourths of an inch, and, with the ivory-end of the knife, raise the corners and edges of the bark. Select a vigorous shoot of this year's growth, but having buds well matured—select a bud that bids fairest to be a leaf-bud, as blossom-buds will fail—insert the knife half an inch below the bud, and cut upward in a straight line, severing the bark and a thin piece of the wood to one half inch above the bud, and let the knife run out: you then have a bud ready for insertion (*c* in cut). The English method is to remove the wood from the bud before inserting it; this is attended with danger to the vitality of the bud, and is, therefore, less certain of success, and it is no better when it does succeed. Hence, American authorities favor inserting the bud with the wood remaining. Insert the lower end of this slip between the two edges of the bark, passing the bud down between those edges, until the top of the slip comes below the horizontal cut, and remaining contiguous to it. If the bud slip be too long, after it is sufficiently pressed down, cut off the top so as to make a good fit with the bark above the cut (*b* in cut). The lower end of the bud will have raised the split bark a little more to make room for itself, and thus will set very close to the stalk. Tie the bud in with a soft ligature;

commence at the bottom of the split, and wind closely until the whole wound is covered, leaving only the bud exposed (*d* in cut). It is more convenient to commence at the top, but it is less certain to confine the slip opposite the bud in close contact with the stalk: this is indispensable to success. We have often seen buds adhere well at the bottom, but stand out from the stalk, and thus be ruined.

Preparation of Buds.—Take thrifty, vigorous shoots of this year's growth, with well-matured buds; cut off the leaves one half inch from the stalks (*e* in cut); wrap them in moist moss or grass, or put them in sawdust, or bury them one foot in the ground.

Bands.—The best yet known is the inside bark of the linden or American basswood. In June, when the bark slips easily, strip it from the tree, remove the coarse outside, immerse the inside bark in water for twenty days; the fibres will then easily separate, and become soft and pliable as satin ribbon. Cut it into convenient lengths, say one foot, and lay them away in a dry state, in which they will keep for years. This will afford good ties for many uses, such as bandages of vegetables for market, &c. Matting that comes around Russia iron and furniture does very well for bands; woollen yarn and candle-wicking are also used; but the bass-bark is best. After ten days the bands should be loosened and retied; then, if the bud is dried, it is spoiled, and the tree should be rebudded in another place; at the end of three weeks, if the bud adheres firmly, remove the band entirely. Better not bud on the south side; it is liable to injury in winter. In the spring, after the swelling of buds, but before the appearance of leaves, cut off the top four inches above the bud; when the bud grows, tie the tender shoot to the stalk (growing bud in cut, *f*). In July, cut the wood off even with the base of the bud and slanting up smoothly.

Causes of Failure.—If you insert a blossom-bud you will get no shoot, although the bud may adhere well. If scions cut for buds remain two hours in the sun with the leaves on, in a hot day, they will all be spoiled. The leaves draw the moisture from the bud, and soon ruin it. Cut the leaves off at once. If you use buds from a scion not fully grown, very few of them will live; they must be matured. If the top of the branch selected be growing and very tender, use no buds near the top of it. If in raising the bark to make room for the bud, you injure the soft substance between the bark and the wood, the bud

will not adhere. If the bud be not brought in close contact with the stalk and firmly confined there, it will not grow. With reasonable caution on these points, not more than one in fifty need fail.

Time for Budding.—This varies with the season. In the latitude of central New York, in a dry season, when everything matures early, bud peaches from the 15th to the 25th of August—plums, &c., earlier. In wet and great growing seasons, the first ten days in September are best. Much budding is lost on account of having been done so late as to allow no time for the buds to adhere before the tree stops growing for the season. If budding is performed too early, the stalk grows too much over the bud, and it gums and dies. It is utterly useless to bud when the bark is with difficulty loosened; it is always a failure.

BUSHES.

The growth of bushes over pastures, along fences, and in the streets, shows a great want of thrift, and an unpardonable carelessness in a farmer. In pastures, so far from being harmless, they take so much from the soil as to materially injure the quality and quantity of the grass. The only truly effectual method of destroying noxious shrubs, is by grubbing them up with a mattock. Frequent cutting of bushes inclining to spread only increases the difficulty, by giving strength and extension to the roots. Cutting bushes thoroughly in August, in a wet season, and applying manure and plaster to promote the growth of grass, will sometimes quite effectually destroy them. Larger trees, as the sweet locust, that are troublesome on account of sprouting out from the roots, when cut down, are effectually killed by girdling two feet from the ground, and allowing to stand one year. The tree, roots, and all, are sure to die.

BUTTER.

Raising the cream, churning, working, and preserving, are the points in successful butter-making. To raise cream, milk may be set in tin, wood, or cast-iron dishes. The best are iron, tinned over on the inside. Tin is better than wood, only on account of its being more easily kept clean. No one can ever make good butter without keeping everything about the dairy perfectly clean

and sweet. Milk should never stand more than three inches deep in the pans, to raise the best and most cream. It should be set in an airy room, containing nothing else. Butter and milk will collect and retain the flavor of any other substance near them, more readily than anything else; hence, milk set in a cellar containing onions, or in a room with new cheese, makes butter highly flavored with those articles.

Temperature is an important matter. It should be regular, at from fifty to fifty-five degrees of Fahrenheit's thermometer. It is sometimes difficult to be exact in this matter, but come as near it as possible. This can be well regulated in a good cool cellar, into which air can be plentifully admitted at pleasure. Those who are so situated that their milk-house can stand over a spring, with pure water running over its stone floor, are favored. Those who will take pains to lay ice in their milk-rooms, in very warm weather, will find it pay largely in the quality and quantity of their butter. Those who will not follow either of the above directions, must be content to make less butter, and of rather inferior quality, out of the same quantity of milk.

Skimming should be attended to when the milk has soured just enough to have a little of it curdle on the bottom of the pan. If it should nearly all curdle, it would not be a serious injury, unless it should become old. If you have not conveniences for keeping milk sufficiently warm in cold weather, place it over the stove at once, when drawn, and give it a scalding heat, and the cream will rise in a much shorter space of time, and more plentifully. Milk should be strained and set as soon as possible after being drawn from the cow, and with the least possible agitation. The unpleasant flavor imparted to milk from the food of the cows, such as turnips or leeks, may be at once removed by adding to the milk, before straining, one eighth of its quantity of boiling water; or two ounces of nitre boiled in one quart of water and bottled, and a small teacupful put in twelve quarts of milk, will answer the same purpose.

Milking should be performed with great care. Experiments have demonstrated that the last drawn from a cow yields from six to sixteen times as large a quantity of better cream than that first drawn. Careless milking will make the quantity of butter less, and the quality inferior, while it dries up the cows. There are probably millions of cows now in the United States that are indifferent milkers from this very cause. Quick and clean milking, from the

time they first came in, would have made them worth twice as much, for butter and milk, as they are now. Always milk as quickly as possible, and without stopping, after you commence, and as nearly as possible at the same hour of the day. Leaving a teacupful, or even half that quantity, in milking each cow, will very materially lessen the products of the dairy, and seriously injure the cows for future use. Great milkers will yield considerable more by having it drawn three times per day. The quantity of milk given by a cow will never injure her, provided she be well fed. As it takes food to make meat, so it does also to make milk; you can never get something for nothing. The best breeds of swine, cattle, or fowls, can not be fattened without being well fed: so the best cows will never give large messes of milk unless they are largely fed.

Churning.—This is entirely a mechanical process. The agitation of the cream dashes the oily globules in the cream against each other, and they remain together and grow larger, until the butter is, what the dairy woman calls, gathered. The butter in the milk, when drawn from the cow, is the same as when on the table, only it is in the milk in the form of very small globes: churning brings them together. The object then to be secured, by any form of a churn, is agitation, or dashing and beating together.

Temperature of the Cream should be from sixty to sixty-five degrees—perhaps sixty-two is best. This had better always be determined by a thermometer immersed in it.

Many churns have been invented and patented; and every new one is, of course, the best. A cylinder is usually preferred as the best form for a churn, and the churning is performed by turning a crank. An oblong square box is far better than a cylinder. In churning in a cylinder, it may often occur that the cream moves round in a body with the dasher, and so is but slightly agitated. But change that cylinder into an oblong square, and the cream is so dashed against the corners of the box that a most rapid agitation is the result, and the churning is finished in a short space of time.

Any person of a little mechanical genius can construct a churn, equal to any in use, and at a trifling expense. It is well to make a churn double, leaving an inch between the two, into which cold or warm water can be poured, to regulate the temperature of the cream. This would be a great saving of time

and patience in churning. Those who use the old-fashioned churns with dashes can most conveniently warm or cool their cream, by placing the churn containing it in a tub of cold or boiling water, as the case may require, until it comes to the temperature of sixty or seventy degrees.

To make butter of extra quality for the fair, or for a luxury on your own table, set only one third of the milk, and that the last drawn from the cow. The Scotch, so celebrated for making butter of more marrowy richness than any other, first let the calves draw half or two thirds of the milk, and then take the remainder. This makes the finest butter in the world.

Preserving Butter depends upon the treatment immediately after churning. Success depends upon getting the buttermilk all out, and putting in all the salt you put in at all, immediately—say within ten minutes after churning. Some accomplish this by washing, and others by working it, being much opposed to putting in a drop of water. Those who use water in their butter, and those who do not, are equally confident of the superiority of their own method. But all good butter-makers agree, that the less you work butter, and still remove all the milk, the better it will be; and the more you are obliged to work it, the more gluey, and therefore the poorer the quality. Very good butter is made by immediately working all the milk out and salting thoroughly—working the salt into every part, without the use of water.

Working over butter, the next day after churning, should be nothing more than nicely forming it into rolls, without any further working or any more salt. An error, that spoils more butter than any other, is that of doing very little with butter when it first comes out of the churn, because it must be gone through with the next day. Many do not know why their butter has different colors in the same mass—some white, and some quite yellow, and all shades between. The reason always is, putting in the salt immediately on churning, but neglecting to incorporate that salt into every part of the mass equally: thus, where there is most salt there will be one color, and where less, another. Another evil is, when the salt is thus put in carelessly, while much buttermilk remains, that salt dissolves; and when the butter is worked over the next day, the salt is mostly worked out, with the milk or water left in, the previous day. The addition of more salt then will not save it. It has received an injury, by retaining the milk or water for twenty-four hours, from which no future treatment will enable it to recover. We recommend washing as preferable; it

has the following advantages: it cools butter quickly in warm weather, bringing it at once into a situation to be properly worked and salted. The buttermilk is also removed more speedily than in any other way; this is a great object. It removes the milk with less working, and consequently with less injury, than the other method. These three advantages, cooling in hot weather, expelling the milk in the shortest time, and working the butter the least, lead us to prefer using water, by one hundred per cent. We have for years used butter that has been made in this way, and never tasted better. Butter made in this way in summer will keep well till next summer, to our certain knowledge. Immediately after churning, pour off all the milk and put in half a pailful of water, more or less according to quantity; agitate the whole with the dasher, and pour off the water. Repeat this once or twice until the water runs off clear, without any coloring from the milk, and nearly all the buttermilk is out; this can all be done in five minutes after churning. Press out the very little water that will remain, and put in all the salt the butter will require, and work it thoroughly into every part. All this need occupy no more than ten minutes, and the butter is set away for putting up in rolls, or packing down in jars the next day. Such butter would keep tied up in a bag, and hung in a good airy place. Best to put it down in a jar, packed close; put a cloth over top, and cover with half an inch of fine salt. The only difficulty in keeping butter grows out of failure to get out all the milk, and thoroughly salt every particle, within fifteen minutes after churning. Speedy removal of buttermilk and water, and speedy salting, will make any butter keep.

This subject is so important, as good butter is such a luxury on every table, that we recapitulate the essentials of good butter making:—

1. Keep everything sweet and clean, and well dried in the sun.
2. Milk the cows, as nearly as possible, at the same hour, and draw the milk very quickly and very clean.
3. Set the milk, in pans three inches deep, in good air, removed from anything that might give it an unpleasant flavor, and where it will be at a temperature of fifty to sixty degrees.
4. Churn the cream at a temperature of sixty-two degrees.
5. Get out the buttermilk, and salt thoroughly within fifteen minutes after

churning, either with water or without, as you prefer. Mix the salt thoroughly in every particle. Put up in balls, or pack closely in jars the next day.

6. Remember to work the butter as little as possible in removing the milk; the more it is worked, the more will it be like salve or oil, and the poorer the quality: hence, it is better to wash it with cold water, because you can wash out the buttermilk with much less working of the butter.

7. To make the best possible quality of butter, use only one third of the milk of the cows at each milking, and that the last drawn.

8. In the winter, when cream does not get sufficiently sour, put in a little lemon-juice or calves' rennet. If too white, put in a little of the juice of carrot to give it a yellow hue.

BUTTERNUT.

This is a rich, pleasant nut, but contains rather too much oil for health. The oil, obtained by compression, is fine for clocks, &c.

The root, like the branches, are wide-spreading, and hence injurious to the land about them. Two or three trees on some corner not desired for cultivation, or in the street, will be sufficient. A rough piece of ground, not suitable for cultivation, might be occupied by an orchard of butternut-trees, and be profitable for market and as a family luxury. The bark is often used as a coloring substance.

CABBAGE.

The best catalogues of seeds enumerate over twenty varieties, beside the cauliflowers, borecoles, &c. A few are superior, and should, therefore, be cultivated to the exclusion of the others.

EARLY YORK is best for early use. It is earlier than any other, and with proper treatment nearly every plant will form a small, compact, solid head, tender, and of delicious flavor. No garden is complete without it.

EARLY DUTCH, AND EARLY SUGARLOAF, come next in season to the Early York, producing much larger heads.

LARGE YORK is a good variety, maturing later than the preceding, and before the late drumheads.

Large Drumhead, Late Drumhead, or Large Flat Dutch, are the best for winter and spring use. There are many varieties under these names, so that cultivators often get disappointed in purchasing seeds. It is now difficult to describe cabbages intelligibly. Every worthless hybrid goes under some excellent name.

A Dutch cabbage, with a short stem and very small at the ground, is the best with which we are acquainted. Of this variety (the seed of which was brought from Germany), we have raised solid heads, larger than a half bushel, while others called good, standing by their side, did not grow to more than half that size. This variety may be distinguished by the purple on the top of the grown head, and by the decided purple of the young plants, resembling the Red Dutch, though not of quite so deep a color.

RED DUTCH, having a very hard, small head, deep purple throughout, is the very best for pickling; every garden should have a few. They are also good for ordinary purposes.

GREEN CURLED SAVOY, when well grown, is a good variety.

The *Imperial*, the *Russian*, Large Scotch for feeding, and others, are enumerated and described, but are inferior to the above. It is useless to endeavor to grow cabbages on any but the best of soil. Plant corn on poor land, and it will mature and yield a small crop. Plant cabbages on similar soil, and you will get nothing but a few leaves for cattle. Therefore, if your land designed for cabbages be not already very rich, put a load of stable-manure on each square rod. Cabbages are a very exhausting crop. The soil should be worked fully eighteen inches deep, and have manure well mixed with the whole. The best preparation we ever made was by double-plowing—not subsoiling, but plowing twice with similar plows: put on a good coat of manure, and plow with two teams in the same furrow, one plow gauged so as to turn a light furrow, and the other a very deep one, throwing it out of the bottom of the first; when the first plow comes round, it will throw the light furrow into the bottom of the deep one. This repeated over the whole plot will stir the soil sixteen or eighteen inches deep, and put from four to six inches of the top, manure and all, in the bottom, under the other. We have done this

admirably with one plow, changing the gauge of the clevis every time round, and going twice in a furrow: this is the best way for those who use but one team in plowing; it is worth much more than the additional time required in plowing. Enrich the surface a little with fine manure, and you have land in the best possible condition for cabbages. This is a fine preparation for onions and other garden vegetables, and for all kinds of berries. Subsoiling is good, but double-plowing is better in all cases, where you can afford to enrich the surface, after this deep plowing.

The alluvial soils of the West need no enriching after double-plowing. Land so level, or having so hard a subsoil as to allow water to stand on it in a wet season, is not good for cabbages. They also suffer more than most crops from drought. One of the most important offices of plenty of manure is its control of the moisture. Land well manured does not so soon feel the effects of drought. One of the best means of preserving moisture about the roots of cabbages, is to put a little manure in the bottom of the holes when transplanting; put it six inches below the surface. Manure from a spent hotbed is excellent for this purpose; it is in the best condition about the time for transplanting cabbages. It is then very wet, and has a wonderful power of retaining the moisture. Manure from the blacksmith-shop, containing hoof-parings, &c., is very good. If the manure be too dry, pour in water and cover immediately. Set the plant in the soil, over the manure, the roots extending down into it, with a little fine mould mixed in it, and it will retain moisture through a severe drought; no further watering will be necessary, and not one out of twenty-five of all your plants will fail to make a good head. In climates subject to drought in summer, cabbages should be set out earlier; they require more time in dry weather than in wet. Should they incline to crack open from too rapid growth, raise them a little, and push them down again; this will break some roots, and so loosen the remainder that the growth will be checked and the heads saved. Winter cabbages should be allowed to stand in the ground as long as possible, without danger of freezing in. The question of transplanting, and of sowing the seed in the places where they are designed to head, has been much controverted. We have succeeded well in both ways, but prefer transplanting; it gives opportunity to stir the ground deep, and keep down weeds, and thus preserve moisture until summer, when it is time to transplant; it also makes shorter, smaller, and straighter stems, which is favorable to a larger growth of heads. Sow seed on poor land; the plants will

be straighter, more hardy, and less affected by insects. Seed for early spring cabbages should be sown on poor soil in September or October; if inclined to get too forward, transplant, once or twice; late in fall, set them close together, lay poles in forks of limbs put down for the purpose, and cover with straw, as a protection from severe frost; the poles are to prevent the covering from lying on the plants.

Preserving, for winter or spring use, is best done by plowing a furrow on land where water will not stand, and placing the heads in the furrow with the roots up. Cover with earth from three to six inches deep, letting the roots protrude. The large leaves will convey all the water off from the heads, and they will come out as fresh and good as in the fall. If you wish some, more easily accessible, for winter use, set them in the cellar in a small trench, in which a little water should be kept, and they will not only be preserved fresh, but will grow all winter, if the cellar be free from frost. They are also well preserved put in trenches eighteen inches deep, out door, with a little good soil in the bottom, and protected with poles and straw as directed for winter plants. Cabbages that have scarcely any heads in the fall, so treated, will grow all winter, and come out good, tender, fresh heads in spring.

Transplanting.—This is usually done in wet weather: if it be so wet as to render the soil muddy by stirring, it injures the plants. This may be successfully done in dry weather, not excessively hot. Have a basin of water, in which dip the root and shake it, so as to wash off all the earth from the seed-bed that adheres to it. Put the plant in its place at once, and the soil in which it is to grow takes hold of the roots readily, and nearly every one will live. Transplant with your hand, a transplanting trowel, a stick, or a dibble made of a spade-handle, one foot long, sharpened off abruptly, and the eye left on for a handle. Put the plant in its place, thrust the dibble down at a sharp angle with the plant, and below it, and move it up to it. The soil will thus be pressed close around the roots, leaving no open space, and the plant will grow. Do not leave the roots so long that they will be doubled up in transplanting—better cut off the ends.

Large cabbages should be three feet apart each way, and in perfectly straight rows; this saves expense in cultivating, as it can be done with a horse. The usual objections of farmers to gardening, on account of the time required to hoe and weed, would be remedied by planting in long, straight rows, at

suitable distances apart, to allow the free use of horse, cultivator, and plow, in cultivating; thus, beets, carrots, cabbages, onions, &c., are almost as easily raised as corn. An easy method of raising good cabbages is on greensward. Put on a good dressing of manure, plow once and turn over handsomely, roll level, and harrow very mellow on the top, without disturbing the turf below; make places for planting seeds at the bottom of the turf; a little stirring of the surface, and destruction of the few weeds that will grow, will be all the further care necessary. The roots will extend under the sod in the manure below it, and will there find plenty of moisture, even when the surface is quite dry, and will grow profusely.

Seed.—Nothing is more difficult in cabbage culture than raising pure seed; nothing hybridizes worse, and in nothing else is the effect worse. It must not be raised in the same garden with anything else of the cabbage or turnip kind; they will mix in the blossoms, and the worse will prevail. Raise seeds only from the best heads, and only one variety; break off all the lower shoots, allowing only a few of the best to mature. Seeds raised from stumps, from which the head has been removed for use, will incline the leaves to grow down, as we often see, instead of closing up into heads.

CALVES.

The best method of raising calves is of much importance. It controls the value and beauty of grown cattle. Stint the growth of a calf, and when he is old he will not recover from it. Much attention has been paid to the breed of cattle, and some are very highly recommended. It is true that the breed of stock has much to do with its excellence. It is equally true that the care taken with calves and young cattle, has quite as much to do with it. We can take any common breed, and by great care in raising, have quite as good cattle, for market or use, as can another, who has the best breed in the world, but keeps them indifferently. But good breeds and good keeping make splendid animals, and will constantly improve them. The old adage, "Anything worth doing at all, is worth doing well" is nowhere more true, than in the care of calves. We shall not pause to present the various and contradictory methods of raising calves, that are presented in the numerous books, on the subject, that have come under our observation. Hay-tea, various preparations of linseed-meal, oilcake-meal, oatmeal, and every variety of ground feed,

sometimes mixed up with gin, or some kind of cheap spirits (for the purpose of keeping calves quiet), are recommended. The discussion of the merits of these, would be of no practical benefit to our readers.

The following brief directions are sufficient:—

1. Seldom raise late calves. Their place is in the butcher's shop, after they are five weeks old.
2. Raise only those calves that are well formed. Straight back, small neck, not very tall, and a good expression of countenance, are the best marks.
3. Let every calf suck its dam two days. It is for the health of the calf and the good of the cow.
4. To fatten a calf, let it suck one half the milk for two weeks, three fourths the third, and the whole the fourth. Continue it another week, and the veal will be better. But we think it preferable to take calves off from the cow after two days. Feed them the milk warm from the cow, and give them some warm food at noon. Feed three times a day, they will fatten faster. It also gives opportunity to put oatmeal in their food after the second week, which will improve the veal, and give you a little milk, if you desire it. Our first method is easier, and our last better, for fattening calves.
5. To raise calves for stock, take them from the cows after the second day. Feed them half the milk (if the cow gives a reasonable quantity) for the first two weeks. Begin then to put in a little oatmeal. After two weeks more, give one fourth of the milk, and increase the quantity of meal. When the calf is eight or ten weeks old, feed it only on meal and such skimmed milk, sour milk, or buttermilk, as you may have to spare. This is the course when the object is to save milk. If not, let the calf have the whole, with such addition of meal as you think desirable. The easiest way to raise calves, when you do not desire the milk for the family or dairy, is to let them run with the cows and have all the milk when they please.

Others let them suck a part of the milk, and feed them with meal, &c., besides. This is difficult. If you milk your own share first, you will leave much less for the calf than you suppose. If he gets his portion first, he will be sure to get a part of yours also. This can only be well done by allowing the calf to suck all the udders, but not clean. The remainder, being the last of the

milk will make the best of butter. But it is difficult to regulate it as you please, and more difficult to feed a calf properly, that sucks, than one that depends wholly upon what you feed him. Hence it is preferable to feed all your calves, whether for veal or stock. A little oilcake pulverized is a valuable addition. Indian-meal and the coarse flour of wheat are good for calves, but not equal to oatmeal. Good calves have been raised on gruels made of these meals, without any milk after the first two weeks.

6. In winter, feed chopped roots and meal, mixed with plenty of hay and pure water, and always from a month old give salt twice a week.

7. If calves are inclined to purge or scour, as the farmers call it, put a little rennet in their food. If they are costive, put in a little melted lard, or some kind of inoffensive oil. These will prove effectual remedies.

There is, however, very little danger of disease, to calves, well, regularly, and properly fed, as above.

Fat calves are not apt to have lice. But should such a thing occur, washing in tobacco-water is a speedy and perfect remedy.

8. During cold nights in fall, and all of the first winter, calves should be shut up in a warm dry place. Keep them curried clean.

The cold and wet of the first winter are very injurious. After they are a year old they will give very little trouble. The great difficulty with calves is a want of enough to eat. They should not only be kept growing, but fat, all the first year. They will then make fine, healthy, and profitable animals.

Chalk or dry yellow loam, placed within their reach is very useful. They will eat of it, enough to correct the excessive acidity of their stomachs. The operation of changing calves into oxen, should be performed before they are twenty days old. It will then be only slightly injurious.

CANS.

These are much used for preserving fruits and vegetables. There are a number of patent articles said to work well. They are, in our opinion, more expensive, and more likely to fail in inexperienced hands, than those that an ordinary

tinman can readily make. The best invention for general use is that that is most simple. Cans should be made in cylindrical form, with an orifice in the top large enough to admit whatever you wish to preserve, and should contain about two quarts. Fill the cans and solder on the top, leaving an opening as large as a pin-head, from which steam may escape. Set the cans in water nearly to their tops, and gradually increase the heat under them until the water begins to boil. Take out the cans, drop solder on the opening, and all will be air-tight. This operation requires at least three hours, as the heating must be moderate. You may preserve in glass bottles, filling and putting in a cork very tight, and well tied, and gradually heating as above; this will require four hours, as glass will be in danger of bursting by too rapid heating. But for tomatoes, or anything that you have no objection to boiling and seasoning before preserving, the best way is to prepare and cook as for the table, putting in only pepper and salt, and fill cans while the mass is boiling, and, with a sealing-wax that you can get at any druggist's laid around the orifice, place the cover upon it; the heat will melt the wax, and when it cools, the cover will be fastened, and all will be air-tight. This will require no process of slow boiling. Set the cans or bottles in a cool cellar, and whatever they contain may be taken out, at the end of a year, as good as when put in. The last method is the best and most simple of all. The whole principle of preserving is to make the cans air-tight.

CARROTS.

These are cultivated for the table, and for food for animals. Boiled and pickled, or eaten with an ordinary boiled dish, they are esteemed. They are really excellent in soups. As a root for animals, they are very valuable. They are often preferred to beets;—this is a mistake—four pounds of beet are equal to five pounds of carrot for feeding to domestic animals. Work the soil for carrots very deep, make it very rich with stable manure, with a mixture of lime; harrow fine and mellow, and roll entirely smooth. Plant with a seed-sower, that the rows may be straight; rows two feet apart will allow a horse and small cultivator to pass between them. Planted one foot apart, and cultivated with a horse, and a cultivator that will take three rows at once, they will yield much more to the acre, and may be cultivated at a moderate expense, exceeding but a little that of ordinary field-crops. Sow as early as convenient, as the longer time they have, the larger will be the product. They

grow until hard frosts, whenever you may sow them. There are several varieties, but the Long Orange is the only one that it is ever best to grow; it is richer than the white, and yields as well: the earlier sorts are no better, as the carrot may be used at any stage of its growth. They should be kept in the ground as long as it is safe. They will stand hard frosts, but, if too much frozen, they are inclined to rot in winter. Dig in fair weather, dry in the sun, and keep dry. It is the best of all root crops, except the beet. All animals will eat it freely, while they have to acquire a taste for the beet.

CAULIFLOWER.

The two varieties known in this country are the English and the French—distinguished, also, as early and late. The French only is suitable for cultivation here; especially in the colder regions, as it is earlier. This is cultivated in every way like cabbage. In several respects it is preferable to cabbage; it has a more pleasant flavor, and is more easy of digestion. It is excellent for pickling. Seeds may be raised in the same way, and with the same precautions, as cabbage; but it is generally imported.

CELERY.

This is one of the finest of our table vegetables, eaten raw with salt, or in soups. Sow seed, early in spring, in open ground; or sow in hotbeds, if you wish it very early. When the plants are six inches high, they should be transplanted in trenches eighteen inches deep, containing six inches of well-rotted manure or compost. This should be well watered, and fine mould mixed with it, and the plants placed in it eight inches apart. The trenches should be from four to six feet apart. If the weather be warm and sun bright at the time of transplanting, a board laid lengthwise over the top of the trench will afford perfect protection. As the plants grow, draw the earth up to them, not allowing it to separate the leaves; do this two or three times during the season, and the stalks will be beautifully bleached. Heavy loam is much better than sand.

Preserving for winter is best done by taking up late in the fall, cutting the small roots off, and rounding down to a point the large root, removing the coarse, useless leaves, and placing in a trench at an angle of forty-five

degrees, so that six inches of the upper end of the leaves will be above the surface. Cover with soil and place poles over, and cover with straw, and in a very cold climate cover with earth. Keep out the water. The end can be opened to take it out whenever you please, and it will be as fresh as in the fall. This is better than the methods of keeping in the cellar; it is more certain, and keeps the celery in perfect condition.

CHEESE.

The methods of cheese-making differ materially in different countries, and in different parts of the same country. It is also so much a matter of experience and observation, that we recommend to beginners to visit cheese-dairies, and get instructions from practical makers. But we give the following more general outlines, leaving our readers to learn all further details as recommended above.

Rennet, or the calf's stomach, is used, as nature's agent to turn the milk, or to curdle it without having it sour. There are many fanciful ways of preparing the rennet, putting in sweet herbs, &c. But the ordinary plain method is quite sufficient—which is, to steep it in cold salt water. The milk should be set at once on coming from the cow. Setting it too hot, or cooling it with cold water, inclines the cheese to heave. Too much rennet gives it a strong, unpleasant smell and taste. Break the curd as fine as possible with the hand or dish, or better with a regular cheese-knife with three blades. This is especially important in making large cheeses; small ones need less care in this respect. If the curd be too soft, scald it with very hot whey or water; if it be hard, use a little more than blood-warm whey: it should stand a few minutes in this whey and then be separated, and the curd put into the cheese-hoop, making it heaped full, and pressed hard with the hand. Spread a cloth over it, and turn it out. Wash the hoop and put back the cheese, with the cloth between the curd and the hoop, and put it in the press. After a few hours take it out, wash the cloth and put it again around the cheese, and return it to the press. After seven or eight hours more take it out again, pare off the edges if they need it, and rub salt all over it—as much as it will take in: this is the best way of salting cheese; the moisture in it at this stage will cause it to absorb just about as much salt as will be agreeable. Return it to the press in the hoop without the cloth; let it stand in the press over night; in the morning turn it in the hoop,

and continue it in the press until the next morning. Place it upon the shelf in the cheese-room, and turn it every day, or at least every other day. If the weather be hot, the doors and windows of the cheese-room should be shut; if cool, they should be open to admit air.

Color.—The richest is supposed to be about that of beeswax. This is produced by annotta, or otter, rubbed into the milk at the time of setting, when warm from the cow—or, if the milk has stood till cold, after it has been warmed. Cold milk must, before setting, be warmed to about blood or milk heat. This coloring process has no virtue but in its influence on the looks of the cheese. Sage cheese is colored by the juice of pounded sage-leaves put into the fine curd before it is put in the hoop; this is the reason of its appearing in streaks, as it would not do if put into the milk, like the annotta. When the cheese is ten days old, it should be soaked in cold whey until the rind becomes soft, and then scraped smooth with a case-knife; then rinse, and wipe and dry it, and return it to the cheese-room, and turn it often until dry enough for market. Rich cheeses are apt to spread in warm weather; this is prevented by sewing them in common cheap cotton, exactly fitting.

Skippers.—Some persons are very fond of skippery cheese. But few, however, like meat and milk together, especially if the meat be alive: hence, to remove skippers from cheese into which they have intruded is quite desirable. The following method is effectual:—wrap up the cheese in thin paper, through which moisture will readily strike; dig a hole two feet deep in pure earth, and bury the cheese;—in thirty-six hours every skipper will be on the outside; brush them off and keep the cheese from the flies, and you will have no further trouble. A mixture of Spanish brown and butter, rubbed on the outside of a cheese, frequently gives that yellow coating so often witnessed, and exerts some influence in preserving it. The rank and putrid taste sometimes observed in cheese may be prevented by putting a spoonful of salt in the bottom of each pan, before straining the milk; it will also preserve the milk in hot weather, and give more curd.

An English cheese called "Stilton cheese," from the name of the place most celebrated for making it, is a superior article, made in the following way: put the cream of the night's milk with the morning's milk; remove the curd with the least possible disturbance, and without breaking; drain and gradually dry it in a sieve; compress it gradually until it becomes firm; put it in a wooden

hop on a board, to dry gradually; it should be often turned between binders, top and bottom, to be tightened as the cheese grows smaller. This makes the finest cheese known. As the size makes no difference, it can be made by a person having but one cow.

To preserve cheese, keep it from flies, and in a place not so damp as to cause mould. Of cheese-pressers there is a great variety: each maker will select the one which he considers best or most convenient, within his reach. In some places, as on the Western Reserve, in Ohio, one establishment makes all the cheese for the neighborhood, buying the curd from all the families around. In such places they have their own methods, which they have understood by all their customers.

CHERRY.

Cherries are among our first luxuries in the line of fruits. We have cultivated varieties, ripening in succession throughout the cherry season. There is no necessity for cultivating the common red and very acid cherry, except in climates too vigorous for the more tender cultivated varieties. The cherry is an ornamental tree, making a beautiful shade, besides the luxury of its fruit. It is one of the most suitable trees we have for the roadside;—it ought to be extensively planted by the highways throughout all our rural districts, as it is in some parts of Europe. In northern Germany the highways are avenues, shaded with cherry-trees for distances of fifty or sixty miles together: these trees have been planted by direction of the princes, and afford shade and refreshment to the weary pedestrian, who is always at liberty to eat as much of the fruit as he pleases; this is eminently worthy of imitation in our own country.

Extremes of cold and heat are not favorable to the cherry: hence, cool places must be selected in hot countries, and warm locations in cold regions. Very much, however, can be done by acclimation; it will, probably, yet naturalize the cherry throughout the continent. A deep and moderately rich loam is the best soil for the cherry; very rich soil causes too rapid growth, which makes the tree tender. It will bear more moisture than the grape or peach, and requires less than the apple or pear. It will endure very dry situations tolerably well, while in very wet ones it will soon perish.

Propagation is generally by budding small trees near the ground. The best stocks are those raised from the seeds of the common black Mazzard. It makes a more thrifty tree than any other. The tree grows very large, and bears an abundance of medium black fruit, smallest at the blossom end, and having seeds very large in proportion to the size of the fruit. In White's Gardening for the South, it is stated that the common Morello of that region does better, by far, for seedling stocks for budding, than the Mazzard. Use, then, the Mazzard for the North, and the Mahaleb or common Morello for the South. Pick them when ripe; let them stand two or three days, till the pulp decays enough to separate easily from the seed by washing. Immediately plant the seeds in rows where you wish them to grow; this is better than keeping them over winter in sand, as a little neglect in spring will spoil them, they are so tender, when they begin to germinate. Keep them clean of weeds. The next spring, set them in rows ten inches or a foot apart, placing the different sizes by themselves, that large ones need not overshadow small ones and prevent their growth. In the following August, or on the last of July, bud them near the ground. The stocks are to be headed back the following spring, and the bud will make five or six feet of growth the same season. The cherry-tree seldom needs pruning, further than to pinch off any little shoots that may come out in a wrong place (and they will be very few), and cut away dead branches. Any removal of large limbs will produce gum, which is apt to end in decay, and finally in the death of the tree. Whatever pruning you must do, do it in the hottest summer weather, and the wounds will dry and prevent the exudation of gum. Trees are generally trained horizontally. Some, however, are trained as espaliers against walls, and in fan shape. When once the form is perfected (as given under Training), nothing is necessary but to cut off—twice in each season, about six weeks apart, in the most growing time—all other shoots that come out within four inches of their base. New shoots will be constantly springing, and the tree will keep its shape and bear excellent fruit. Trees so trained are usually in warm locations, and where they can be easily protected in winter; hence, this is adapted to the finer and more tender varieties. The varieties of cherries are numerous, and rapidly increasing. They are less distinguishable than most other fruits. We shall only present a few of the best, and give only their general qualities, without any effort to enable our readers to identify varieties. (See our remarks on the nomenclature of apples.)

Downing, in 1846, recommended the following, as choice and hardy, adapted

to the middle states:—

1. Black Tartarean.
2. Black Eagle.
3. Early White Heart.
4. Downton.
5. Downer's Late.
6. Manning's Mottled.
7. Flesh-color'd Bigarreau
8. Elton.
9. Belle de Choisy.
10. May Duke.
11. Kentish.
12. Knight's Early Black.

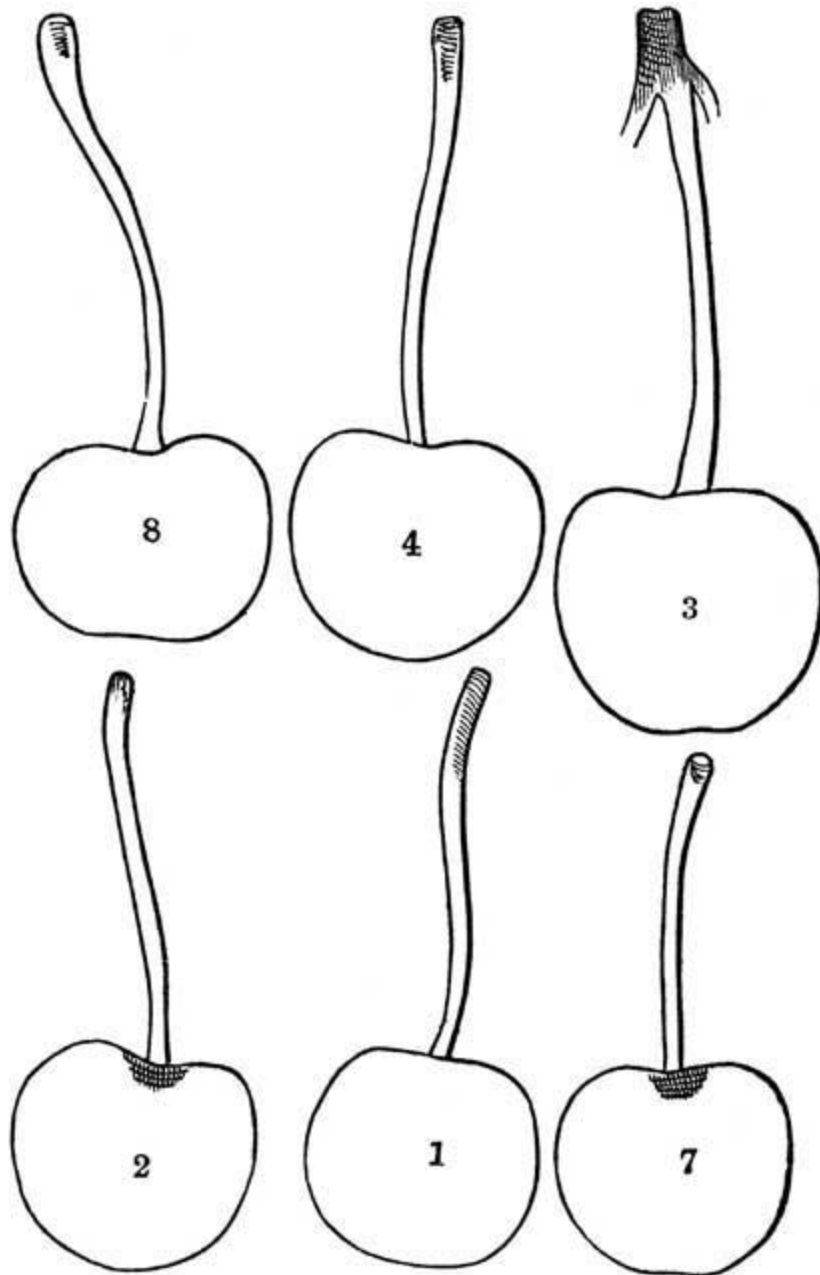
The National Convention of Fruit-growers recommend the following as the best for the whole country:—

1. May Duke.
2. Black Tartarean.
3. Black Eagle.
4. Bigarreau.
5. Knight's Early Black.
6. Downer.
7. Elton.
8. Downton.

We recommend the following as all that need be cultivated for profit. They are adapted alike to the field and the garden. We omit the synonyms, and give only the predominant color. The figures in the cuts refer to our numbers in the list:—

	Name.	Color.	Time.
1.	Rockport Bigarreau,	red.	June 1st.
2.	Knight's Early Black,	black.	June 5th.
	Black		June

3. Tartarean,	purplish.	15th.
4. Kirtland's Mary,	marbled, light-red.	June, July.
5. Delicate,	amber- yellow.	June 25th.
6. Late Bigarreau,	deep-yellow.	June 30th.
7. Late Duke,	dark-red.	Aug. 10th.
8. Cleveland Bigarreau,	red.	June 10th.
9. American Heart,	pale.	June 1st.
10. Napoleon,	purplish- black.	July 5th.



Cherries--Natural size and shape. (See Page 121)

The time is that of their greatest perfection, but varies with latitude and location.

We know none better than the foregoing. In the long lists of the fruit-books, there are others of great excellence, some of which are hardly distinguishable from our list. We recommend to all cultivators to procure the best in their localities, under the advice of the best pomologists in their vicinity. Such men as Barry will be consulted for the latitude of Western New York; Elliott and

Kirtland for Cleveland, Ohio; Cole and others for New England and Canada; Hooker and other great fruit-growers of Southern Ohio, &c., &c. These gentlemen, like all scientific men, are happy to communicate their knowledge for the benefit of others.

We see no reason for cultivating more than ten or twelve varieties; and, as the above are productive and excellent, including all desirable colors and qualities, and ripening through the whole cherry season, we know not what more would be profitable to the cultivator. If you wish more for the sake of variety, your nurseryman will name them, and show the quality of each, that renders it "*the best* that ever was," until you will become tired of hearing, and more weary of paying for them.

Decayed wood, spent tanbark, and forest-leaves, are good for the cherry. In removing and transplanting, be careful not to injure the roots, or expose them to sun and air, as they are so tender, that a degree of exposure that would be little felt by the apple or peach tree will destroy the cherry. If you are going to keep a cherry-tree out of the ground half an hour, throw a damp mat, or damp straw, over the roots, and you will save disappointment. The rich alluvial soils of the West are regarded unfavorable to the cherry. We know from observation and experience that the common red cherry does exceedingly well there, while the best cultivated are apt to suffer much from the winters. One reason is, the common cherry is a slow-going, hardy tree, while the cultivated is more thrifty, and therefore more tender. We give the following as a *sure method* of raising the cultivated cherries in great perfection on all the rich prairies of the West. It is all included in dry locations, root-pruning, and slight heading-in:—

1. Dry locations. It is known that the rich alluvial soils of the West are remarkable for retaining water in winter. On level, and even high prairie land, water will stand in winter, and thoroughly saturate the soil and freeze up. This is very destructive to the tender, porous root of the cherry-tree. How shall such locations be made dry, and these evils prevented? By carting on gravel and sand. Put two or three loads of sand or gravel, or both, in the shape of a slight mound, for each cherry-tree. There should first be a slight excavation, that the sand and gravel may be about half below the level of the surrounding soil, and half above it: this will so elevate the tree that no water can stand around it, and none can stand in the gravel and sand below it. The

freezing of such soil will not be injurious to the roots of the tree.

2. Root-pruning is to prevent too rapid growth. Such growth is always more tender and susceptible of injury from sudden and severe freezing. (See Root-pruning.)

3. Heading-in puts back the growth and throws the sap into the lateral twigs, thus maturing the wood already grown, instead of producing new wood, so young and tender that it will die in winter and spread decay through the whole tree. Heading-in, with the cherry, must only be done with small twigs. Cultivators will see at a glance that this method will certainly succeed in all the West and Southwest.

It is considered difficult to raise cherries at the South; the hot sun destroys the trees. Plant in the coolest situations, where there is a little shade from other trees, though not too near, or from buildings; cut them back, so as to cause shoots near the ground, and then head-in as the peach, so as to keep the whole covered with leaves, to shade the trunk and large limbs, and perfect success will crown your efforts. But in all cutting-back and heading-in of cherry-trees, remove the limbs when very small.

CHARCOAL.

There are but few who realize the value of charcoal applied to the soil. Whoever will observe fields where coal has been burned, will see that grass or grain about the bed of the former pits, will be earlier and much more luxuriant than in any other portion of the field. This difference is discernible for twenty years. It is the best known agent for absorbing any noxious matter in the soil or in the moisture about the roots of the trees. No peach-tree should be planted without a few quarts of pulverized charcoal in the soil. This would also prove highly beneficial to cherry-trees on land where they might be exposed to too much moisture. Its color also renders it an excellent application to the surface of hills of vines. It is quite effectual against the ravages of insects, and so absorbs the rays of the sun as to promote a rapid growth of the plants.

CHESTNUTS

Are among our best nuts, if not allowed to get too dry. When dried hard they are rather indigestible. The tree grows well in most parts of the United States, provided the soil be light sand or dry gravel. If the soil be not suitable, every man may have a half-dozen chestnut-trees, at a trifling expense. Haul ten or fifteen loads of sand upon a square rod, and plant a tree in it, and it will flourish well. Five or six trees would afford the children in a family a great luxury, annually. The blossoms appear so very late, that they are seldom cut off by the frost. The second growth chestnut-tree is also decidedly ornamental.

CIDER.

The usual careless way of making cider, in which is used all kinds of apples, even frozen and decayed ones, and without any reference to their ripeness; without straining, and neglecting all means of regulating the fermentation, is too well known. This is the more general practice throughout the country; but it makes cider only fit for vinegar, although it is used for general purposes. We give the most approved method of making and keeping cider, that is better for invalids than any of our adulterated wines (and this is the character of nearly all our imported wines). Our domestic wines, and bottled cider, should take the place of all others.

Select apples best suited for cider, and gather them at the commencement of hard frosts. Let them lie a few days, until they become ripe and soft. Then throw out all decayed and immature fruit. Grind fine and uniform. Let the pulp remain in the vat two days. It will increase the saccharine principle and improve the color. Put into the press in dry straw, and strain the juice into clean casks. Place the casks in an open shed or cellar, if it be cold weather, give plenty of air and leave the bung out. As the froth works out of the bung, fill up every day or two, with some of the same pressing kept for the purpose. In three weeks or less this rising will cease, and the bung should be put in loose, and after three days driven in tight. Leave a small vent-hole near the bung. In a cool cellar the fermentation will cease in two days. This is known by the clearness of the liquor, the thick scum that rises, and the cessation of the escape of air.

Draw off the clear cider into a clean cask. If it remains quiet it may stand till

spring. A gill of fine charcoal added to a barrel will secure this end, and prevent fermentation from going too far. But if a scum collects on the surface, and the fermentation continues, rack it off again at once. Then drive the vent-spile tight. Rack it off again in early spring. If not perfectly clear, dissolve three quarters of an ounce of isinglass in cider, and put it in the barrel, and it will soon be perfectly fine. Bottle between this and the last of May. Fill the bottles within an inch of the bottom of the cork, and allow them to stand an hour, then drive the cork. Lay them in dry sand, in boxes in a cool cellar, and the cider will improve by age, and is better for the sick than imported wines.

CITRONS

Are only used for preserving. Their appearance and growth resemble in all respects the watermelon. Planted near the latter, they utterly ruin them, making them more citron than melon. They are injurious to most other contiguous vines. They are to be planted and cultivated like the watermelon. Are very fine preserved; but we think the outside (removing the rind) of a watermelon better, and should not regret to know, that not another citron was ever to be raised.

CLOVER.

The only varieties successfully cultivated in this country, are the red and the white. Red clovers are divided into large, medium, and small. The white is all alike. The long-rooted clover of Hungary is an excellent productive variety, enduring successfully almost any degree of drought. But in all the colder parts of this country it winter-kills so badly as to render it unprofitable. Clover makes good pastures, being nutritious, and early and rapid growing. Red-clover makes fair hay, though inferior to timothy or red-top. White clover is unsuitable for hay; it shrinks so much in drying, that it is very unproductive. It is the best of all grasses for sheep pasture, and its blossoms afford in abundance the best of honey. Red clover plowed in, even when full-grown, is an excellent fertilizer. It begins to be regarded, in western New York, as productive of the weevil, so destructive to wheat. Further observation is necessary to settle this question.

Red-clover hay is too dusty for horses, and too wasteful for cattle. The stalks are so large a proportion, and so slightly nutritious, that it is unprofitable even as cut-feed. It is best to cultivate clover mainly for pastures and as a fertilizer. Sowing clover and timothy together for hay is much practised. The first year it will be nearly all clover, and the second year mostly timothy. But sown together, they are not good for hay, because they do not mature within ten or fifteen days of the same time. But, for those who are determined to make hay out of red clover, the following directions for curing may be valuable: mow when dry, spread at once, and let it wilt thoroughly; then put up into small cocks, not rolled, but one fork full *laid* upon another until high enough;—it will then shed water; but when rolled up, water will run down through. Let it stand till thoroughly dried, and then draw into the barn; it will be bright and sweet. Another method is to cut when free from dew or rain, spread even, and allow it to wilt, and the leaves and smaller parts to dry; then draw into the barn, putting alternate loads of clover and dry straw into the mow, salting the clover very lightly. The clover is sometimes put in when quite green, and salted sufficiently to preserve it. It is injurious to cattle, by compelling them to eat more salt than they need. Cattle will eat but little salt in winter, when it stands within their reach; too much salt in hay compels them to eat more, which engenders disease. Clover cured as above makes the best possible clover-hay, if great care be used to prevent excessive salting.

Saving clover-seed is a matter of considerable importance. The large red clover is too late a variety to produce seed on a second crop the same season, as do the medium and small. The first growth must be allowed to ripen. Cut when the heads are generally dead, but before it has begun to shell. The medium and small red clovers will produce a good crop of seed from second growth, if it be not too dry, immediately after mowing. Cut when the heads generally are dry, rake into small winrows at once, and soon put it in small bunches and let it stand until very dry, and then draw in. Raking and stirring after it becomes dry will waste one half of it.

COFFEE BEAN.

This grows in a pod somewhat resembling the pea; easily raised, as other beans; and is very productive. Browned and ground, it is used as a substitute for coffee. By many persons it is much esteemed. If this and the orange carrot

were adopted extensively, instead of coffee, it would afford a great relief to the health, as well as the pockets, of the American people.

CORN.

This is the most valuable of all American products of the soil, not excepting wheat or cotton. It is used for human food all over the world. And there is no domestic animal or fowl, whose habits require grain, whether whole or ground, that is not fond of it. It is easily raised, and is a sure and abundant crop, in all latitudes south of forty-six degrees north. The varieties are few, and principally local. The soil can not be made too rich for corn. It should be planted in rows each way, to allow cultivating both ways with a horse. The distance of rows apart has been a subject of some differences of opinion; there is a disposition to crowd it too near together. In western New York, where much attention has been given to it, the usual distance is three and one half feet each way; others plant four feet apart. On all land we have ever seen, we believe four feet apart each way, with four or five stalks in a hill, will produce the largest yield. It lets in the sun sufficiently around every hill, and the proportion of ears to the stalks will be larger than in any other distance. Planting with a span of horses, and a planter on which a man can ride and plant two rows at once, is the easiest and most expeditious. We can not too strongly recommend harrowing corn as soon as it comes out of the ground. It increases the crop, and saves much expense in cultivating. All planters should know that Indian corn is one of those plants which will come to maturity at a certain age, whether it be large or small; hence, anything that will increase the growth while young will add to the product. Corn neglected when small receives, thereby, an injury from which it will never recover; after-hoeing may help it, but never can fully restore it. If there are small weeds, the harrowing will destroy them, and give all the strength of the soil to the young corn; if there are no weeds, the effect of the harrowing will be to give the young plants twice as large a growth in the first two weeks as they would make without it. Harrow with a **V** drag, with the front tooth out, that the remaining teeth may go each side of the row. Use two horses, allowing the row to stand between them; let the harrow-teeth run as near the corn as possible. Never plant corn until the soil has become warm enough to make it come up quickly and grow rapidly. If you feed corn to cattle whole, feed it

with the husks on, as it will compel them to chew it better, and will thus be a great saving. Crib corn only when very dry, and avoid the Western and Southern method of leaving cribs uncovered; the corn thus becomes less valuable for any use. A little plaster or wood-ashes applied to corn on first coming up, and again when six inches high, will abundantly repay cost and labor;—it will pay even on the prairie-lands of the West, and is quite essential on the poorer soils of the East and North. It had better never be neglected. The crop will weigh more to the acre, by allowing it to stand as it grew, until thoroughly dry. The next larger crop is when the stalks are cut off above the ear (called topping) after it has become glazed. Still a little less will be the product when it is cut up at the ground, while the leaves are yet quite green. The two latter methods are adapted for the purpose of saving fodder in good condition for cattle. Intelligent farmers regard the fodder of much more value than the decrease in the weight of the grain. Corn thus cut up, and fed without husking, is the best possible way for winter-fattening cattle on a large scale, and where corn is abundant. To save the whole, swine should follow the cattle, changing yards once a week.

Seed-corn should be gathered from the first ripe large ears before frost, and while the general crop is yet green. Select ears above the average size, that are well filled out to the end, and your corn will improve from year to year. Take your seed indiscriminately from the crib at planting-time, and your corn will deteriorate. The largest and best ears ripen neither first nor last; hence, select the largest ears before all is ripe, and reject the small earliest ears. Soaking seed twenty-four hours, and then rolling in plaster before planting, is recommended; it is conveniently practised only where you plant by hand. Soaking without rolling in plaster is good, if you plant in a wet time; but if in a dry time, it is absolutely injurious. Once in a while there occurs quite a general failure of seed-corn to come up. Farmers say that their corn looks as fair as ever, but does not vegetate well. When this is general, there is a remedy that every farmer can successfully apply. The difficulty is not (as we have often heard asserted) from the intense cold of the winter: it is sometimes the result of cold, wet weather after planting. But we do not believe that such would be the effect, with good seed, on properly-prepared land. The difficulty is, the fall was very wet, and the seed was allowed to stand out and get thoroughly soaked; when it was gathered it was damp, and the intense cold of winter destroyed its vitality, without injuring its appearance. There is

no degree of cold, in a latitude where corn will grow, that will injure the seed, if it be gathered dry and kept so. Our rules for saving seed, given above, will always remedy this evil. This is, perhaps, the most profitable of all green crops for soiling cattle. Sown on clean, mellow land, it will produce an enormous weight of good green fodder, suitable for summer and early fall feeding of cows, just at a time when dry weather has nearly destroyed their pastures. Corn-fodder, well cured, is better for milch-cows than the best of hay. Cut fine and mixed with ground feed, it is excellent for cattle and horses. It is best preserved in small stacks or large shocks, that will perfectly dry through. The tops and leaves, removed while green, are very fine.

COTTON.

No product of the soil is more useful than this. To this country alone we give the highest value to Indian corn. But, in usefulness to the whole world, corn must yield the palm to cotton. It employs more hands and capital in manufacturing, and enters more largely into the clothing of mankind, than any other article. The history of cotton and the cotton-gin, and of the manufacture of cotton goods, is exceedingly interesting. The eminence of Great Britain as the first commercial nation of the world is due, in no small degree, to her cotton manufactures. And the influence of this great staple American product upon all the interests of this country, social and political, civil and religious, is universally felt and acknowledged. The cotton-fields of the South, at certain stages of growth, and especially when in bloom, present scenes of beauty unsurpassed by any other growing crop. It does not come within our design in this work to give a very extended view of cotton culture. This business in the United States is confined principally to a particular class of men, known as planters. They cultivate it on a large scale, having the control of large means. Such men seek knowledge of those of their own class, and would hardly condescend to listen to an essay on their peculiar business, written by a Northern man, not experienced in planting. And yet an article, not covering more than ten pages of this volume, might be written, condensing in a clear manner all that is established in this branch of American industry, as found in the publications of the South. Such an article, well written, by a man who would be regarded good authority, would be of vast pecuniary value to the South. Whoever carefully reads Southern agricultural papers, and "TURNER'S COTTON-PLANTER'S MANUAL," will see a

great conflict of opinions on the subject, and yet a presentation of many facts, that one thoroughly conversant with soil culture in general would see to be true and important. The embodiment of these facts and principles in a brief, plain article that would be received and practised, would add value to the annual cotton crop, that would be counted by millions. What better service can some Southern gentleman do for his own chosen and favorite region than to write such an article? We give the following brief view of the whole subject, not presuming to teach cotton-planters what they are supposed to understand much better than we do, but to throw out some thoughts that may be suggestive of improvements that others may mature and carry out, and to lead young men, just commencing the business of planting, to look about and see if they may not make some improvements upon what they behold around them. This will not fail of being interesting to Northern men, most of whom know nothing of the cotton-plant, or the modes of its cultivation. It is interesting, too, that some of the most essential points are in perfect accordance with the great principles of soil culture throughout the world.

There are three species of cotton: tree-cotton, shrub-cotton, and herbaceous cotton. The tree-cotton is cultivated to considerable extent in northern Africa, and produces a fair staple of cotton for commerce; being produced on trees from ten to twenty-five feet high, it is not so easily gathered. The shrub-cotton is cultivated in various parts of the world, particularly in Asia and South America. Growing in the form of small bushes, it is convenient, and the staple is fair. But these are both inferior to the herbaceous cotton. This is an herb growing annually, like corn, a number of feet in height, more or less according to soil and season, and producing the best known cotton. Under these species there are many varieties: we need speak only of the varieties of herbaceous cotton. Writers vary in their estimates of varieties; some say there are eight, and others put them as high as one hundred. This is a question of no practical moment. The sea-island cotton, called also "long staple" on account of its very long silky fibres, is the finest cotton known. Its name arose from the fact of its production in greatest perfection on the low, sandy islands near the coasts of some of the Southern states. It does well on low land near the seashore. The saltiness and humidity of such locations seem peculiarly favorable to its greatest perfection. It yields about half as much as the "short staple" called Mexican and Petit gulf cotton, and known in commerce as upland cotton. But the sea-island, or long staple, sells for three or four times

as much per pound, and, hence, is most profitable to the planter, in all regions where it will flourish well. The Mexican is very productive on most soils, and is easily gathered and prepared for market. There are quite a number of other varieties; as, banana, Vick's hundred-seed, Pitt's prolific, multibolus, mammoth, sugar-loaf, &c., &c. The sugar-loaf is highly commended, as are some of the others named. They have had quite a run among seed-sellers. Most of these varieties are the improved Mexican. It is well to get seed frequently from a distance; but any extravagant prices are unwise. Improvement of cotton-seed is an important part of its most profitable culture. While much said about it by interested parties is doubtless mere humbug, yet there is great importance to be attached to improvement of seed. This is true of all agricultural products, and no less so of cotton than of others. Two things only are essential to constant improvement in cotton-seed—*selection* and *care*. Select from the best quality, producing the largest yield, and maturing early; pick it before much rain has fallen on it after ripening; dry it thoroughly before ginning, and dry it very thoroughly after it is clear of the fibre, before putting it in bulk. Cotton-seed, without extra care in drying, has moisture enough to make it heat in bulk, by which its germinating power is greatly impaired. It is this, and the effects of fall rains, that causes seed to trouble planters so seriously by not coming up: this makes it difficult to obtain good even stands, and causes much loss by diminished crops. Care in these respects would add many pounds to the acre in most cotton-fields of the land.

Preparing the Soil for Planting.—On all land not having a porous subsoil, plow very deep; it gives opportunity for the long tap-root of the plant to penetrate deep, and guard against excessive drought. The usual custom is to lay the ground into beds, elevated a little in the middle, and a depression between them, in which excessive moisture may run off; also to increase the action of the sun and air. The surface of the soil to be planted should be made very fine and smooth. This is true of everything planted—it should be in finely-pulverized soil; it comes up more readily and evenly. Soil left in coarse lumps or particles gives the air too much action on the germinating seeds and young plants, and retards and stints their growth. Deep plowing guards alike against too much or too little moisture. Too much water has room to sink away from the surface and allow it to dry speedily. It also forms a sort of reservoir to hold water for use in a drought. The seed should be planted in as

straight a line as possible, from three and a half to five and a half feet apart one way, and from fourteen to twenty-five inches the other, according to the quality of the land, and the growth of the variety planted. Rich lands will not bear the plants so close as the poor. Many are great losers by not securing plants enough on the ground. Straight lines greatly facilitate culture, as it can mostly be done with the plow or cultivator. Turning land over deep, just before planting, is the best known remedy for the cut-worm; it is said to put them back until the plants grow beyond their reach. The best planters generally cover with a piece of plank drawn over the furrow in which the seed is dropped. It would be far better to roll it, as some few planters do; the effect on the early vegetation of the seed and rapid growth of the young plant would be very great, on the general principles given on "Rolling." The object of cultivation is to keep down the grass, which is the great enemy of the cotton. Plowing the last thing before planting aids this, by giving the cotton quite as early a start as the weeds or grass. Cultivate early, and the grass will be easily covered and killed. Always plant when it will come up speedily and grow rapidly; this is better than very early planting, and certainly much better than very late. Thin out to one in a place, as early as the plants are out of danger of dying. Gathering should commence as soon as bolls enough are in right condition to allow a hand to gather forty pounds per day. It is better and cheaper than to risk the injury from rains after the crop is ripe.

MANURES.—Perhaps this is, at the present time, the greatest question for cotton-planters. The application of all the most approved principles and agents of fertilization would do more for the interests of the cotton crop than anything else. Cotton-plantations are sometimes said to run down so as to render it necessary to abandon portions of the land, and select new. Instead of this, land may not only be kept up with proper manuring, but made to yield larger crops from year to year. The following analysis of the ash of the cotton-plant will indicate the wants of the soil in which it grows:—

1. Potash	29.58
2. Lime	24.34
3. Magnesia	3.73
4. Chloride	0.65
5. Phosphoric acid	34.92

6. Sulphuric acid	3.54
7. Silica	3.24
	100.00

This analysis shows that the soil for cotton needs much lime, bones or bone-dust, and wood-ashes, besides the ordinary barn-yard and compost manures. All the preparations and applications of manures specified in this work, under the head of "Manures," are applicable to cotton. The usual recommendations of rotation in crops is, perhaps, more important in cotton culture than anywhere else. Judicious fallowing, on principles adapted to a Southern climate, is another great means of keeping up and improving the land. This is also the only effectual means of guarding against the numerous enemies and diseases of the cotton-plant. The health of the plants is secured, and they are made to outstrip their enemies only by the fertility and fine tilth of the soil in which they grow. This is confirmed on every hand by the correspondence of the most intelligent planters of the South. Let cotton-growers go into a thorough system of fertilization of their soils, and attend personally to the improvement of their cotton-seed, by selection, as recommended above, and the result will be an addition of one eighth, or one fourth, to the products of cotton in the United States, without adding another acre to the area under cultivation. When this comes to be understood, men of small means will cultivate a little cotton by their own individual labor, as the poorer men do corn and other agricultural products, and thus improve their condition. The above suggestions are the conclusions to which we come, from a thorough examination of what has been published to the world on this subject. We recommend the careful perusal of "The Cotton-Planter's Manual," by Turner (published by Saxton and Co., New York), and increased attention to the subject, by the intelligent, educated, and practical men with whom the cotton-growing regions abound.

COWS.

The cow occupies the first place among domestic animals, in value to the American people, not excepting even the horse. From the original stock, still kept as a curiosity on the grounds of some English noblemen, cattle have

been greatly improved by care in breeding and feeding. Those wild animals are still beautiful, but only about one third of the weight of the ordinary improved cattle, and not more than one fourth that of the *most improved*. Improving the breed of cattle is a subject by itself, demanding a separate treatise. It is not to be expected that we should go into it at length in a work like this. But so much depends upon the cow, that we can hardly write an article on her without giving those general principles that lie at the foundation of all improvement in cattle. The few suggestions that follow, if heeded, would be worth many times the value of this book to any farmer not already familiar with the facts. The cow affects all other stock in two ways; first, the form of calves, and consequently of grown cattle, is affected as much by the cow as by the bull. The quality and quantity of her milk, also, has a great influence upon the early growth of all neat stock. Cattle are usually named from their horns, as "short horns," &c. It is a means of distinction, like a name, but not expressive of quality. The leading marks of a good cow are, medium height for her weight, small neck, straight and wide back, wide breast—giving room for healthy action of the lungs—heavy hind-quarters, and soft skin with fine hair, skin yellowish, with much dandruff above the bag behind. A smart countenance is also expressive of good qualities; there is as much difference in the eyes and expression of cattle as of men. Select only such cows to raise stock from, and allow them to go to no bull that has not good marks, and is not of a superior form. Another important matter is to avoid breeding in and in. This is injurious in all domestic animals and fowls. Always have the cow and the bull from different regions: attention to this would constantly improve any breed we have, and by improving the size of cattle, and milking qualities of cows, would add vast amounts to the wealth of farmers, without the necessity of purchasing, at a great price, any of the high-bred cattle. We have observed, in our article on calves, that abundant feeding during the first year has much to do with the excellence of stock. Unite with these regularity in feeding, watering, and salting, keeping dry and warm in stormy, cold weather, and well curried and clean, and a farmer's stock will be much more profitable to him. But this brief mention of the general principles must suffice, while we give all the further space we can occupy with this article to—

THE INFALLIBLE MARKS OF THE MILKING QUALITIES OF COWS.—M. Francis Guenon, of France, has published a treatise, in which he shows, by external

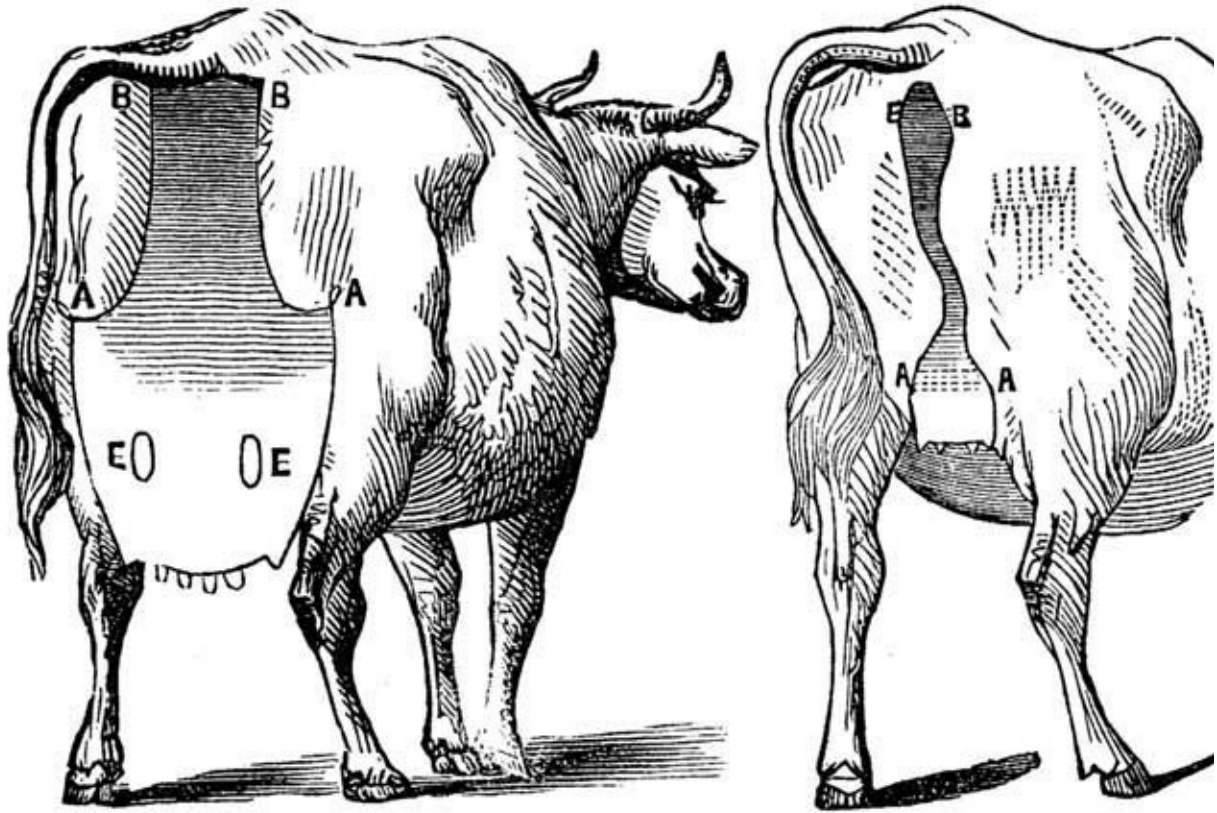
marks alone, the quality and quantity of milk of any cow, and the length of time she will continue to give milk. These marks are so plain, that they are applicable to calves but a few weeks old, as well as to cows. Whoever will take a little pains to understand this, can know, when he proposes to buy a cow, how much milk she will give, with proper feed and treatment, the quality of her milk, and the length of time she will give milk after having been gotten with calf. If the farmer has heifer-calves, some of which he proposes to send to the butcher and others to raise, he may know which will make poor milkers, and which good ones, and raise the good and kill the poor. Thus, he may see a calf that his neighbor is going to slaughter, and, from these external marks, he may discover that it would make one of the best milking cows of the neighborhood; it would then pay to buy and raise it, though he might have to kill and throw away his own, which he could see would make a poor cow if raised. Thus, all extraordinary milkers would be raised, and all poor ones be slaughtered: this alone would improve the whole stock of the country twenty-five per cent. in as many years. Attention has been called to this, in the most emphatic manner, by *The New York Tribune*—a paper that always takes a deep interest in whatever will advance the great industrial interests of the whole people—and yet, this announcement will be new to a vast number of farmers into whose hands this volume will fall. To many it will be utterly incredible, especially when we inform them that the indications are, mainly, the growth of the hair, on the cow behind, from the roots of the teats upward. "Impossible!" many a practical, common-sense man will say. But that same man will acknowledge that a bull has a different color, different neck, and different horns, left in his natural state, from those he would exhibit if altered to an ox. Why is it not equally credible that the growth of the hair, &c., should be affected by the secretion and flow of the milk on that part of the system where those operations are principally carried on? But, aside from all reasonings on the subject, the fact is certain, and whoever may read this article may test its correctness, as applied to his own cows or those of his neighbor. The great agriculturists of France (and it is no mean agricultural country) have tested it, under the direction of the agricultural societies, and pronounced it entirely certain. This was followed by an award, by the French government, of a pension of three thousand francs per annum to Guenon, as a benefactor of the people by the discovery he had made. The same has been amply tested in this country, with the same certain results. It now only remains for every farmer to test it for himself, and avail

himself of the profits that will arise from it. Guenon divides cows into eight classes, and has eight orders under each class, making sixty-four cows, of which he has cuts in his work. He also adds what he calls a bastard-cow in each class, making seventy-two in all. Now, to master all these nice distinctions in his classes and orders would be tedious, and nearly useless. Efforts at this would tend to confusion. We desire to give the indications in a brief manner, with a very few cuts; and yet, we would hope to be much better understood by the masses than we believe Guenon to be. We claim no credit; Guenon is the discoverer, and we only promulgate his discovery in the plainest language we can command; and if we can reach the ear of the American farmers, and call their attention to this, we shall not have labored in vain.

The appearance of the hind-part of the cow, from a point near the gambrel-joint up to the tail, Guenon calls the escutcheon. The following cuts show the marks of all of Guenon's eight classes, the first and the last in each class. The intermediate ones are in regular gradation from the first to the eighth order. Each class is divided into high, medium, and low, yielding milk somewhat in proportion to their size. We give the quantity of milk which the large cows will yield. This also supposes cows to be well fed on suitable food. Smaller cows of the same class and order, or those that are poorly cared for and fed, will, of course, give less.

The names of all these eight classes are entirely arbitrary—they mean nothing. M. Guenon adopted them on account of the shape of the escutcheon, or from the name of the place from which the cows came. But cows with these peculiar marks are found among all breeds, in all countries, and of all colors, sizes, and ages. These marks are certain, except the variations that are caused by extra care or neglect.

Fig. 1. FIRST CLASS. Fig. 2.

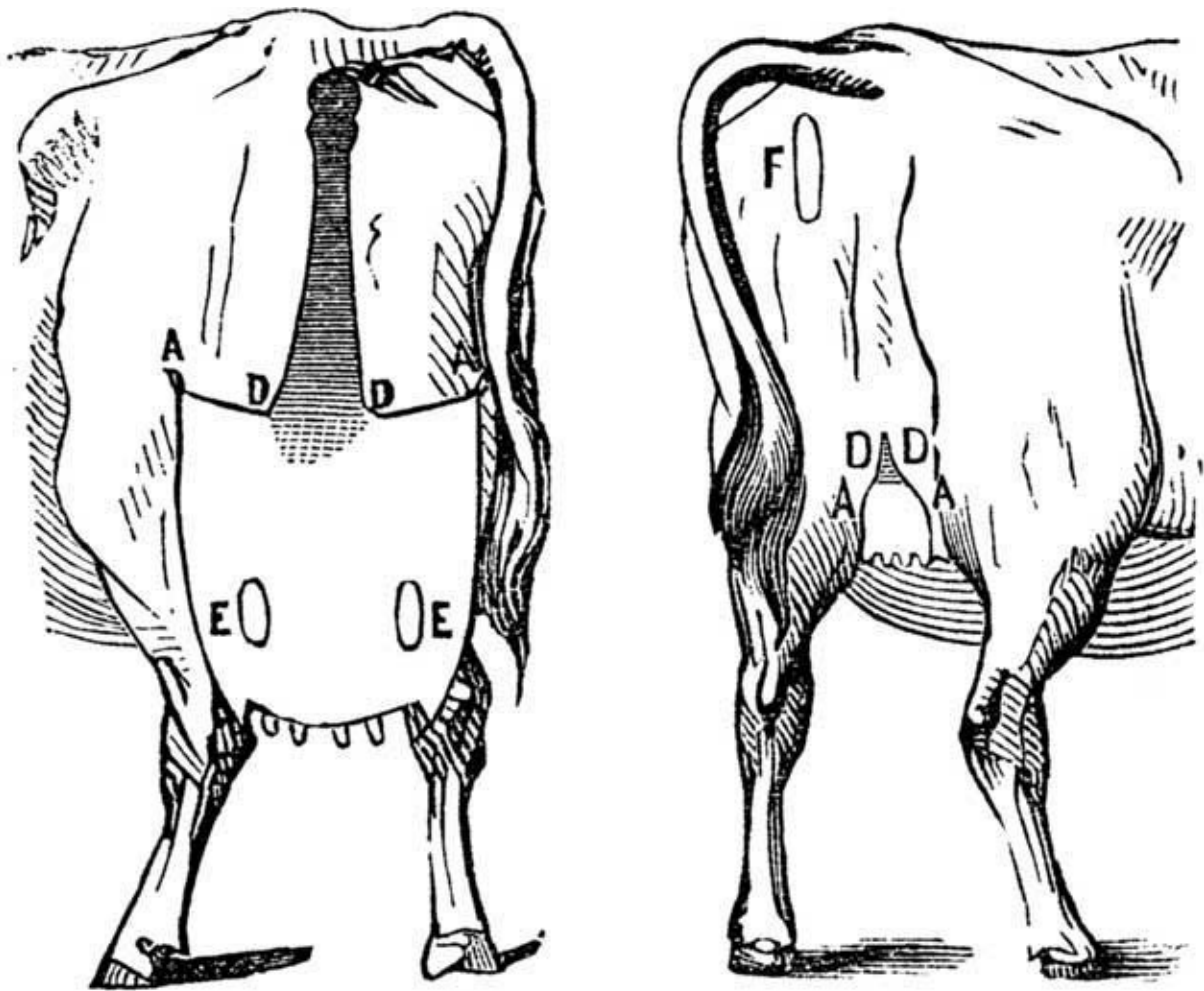


Order 1. Flanders Cow. Order 8.

This class of cows has a delicate bag, covered with fine downy hair, growing upward from between the teats, and, above the bag behind, it blends itself with a growth of hair pointing upward, and covering the region marked in figure 1. This upward growth of hair begins on the legs just above the gambrel-joint, covers the inside of the thighs, and extends up to the tail, as in figure first. Above the hind teats they generally have two oval spots, two inches wide by three long, formed by hair growing downward, and of paler color than the hair that surrounds them (E, E, in fig. 1). The skin covered by the whole of this escutcheon is yellowish, with a few black spots, and a kind of bran, or dandruff, detaches from it. Cows of this class and order, when well kept, give about twenty-two quarts of milk per day, when in full flow, and before getting with calf again; after this a little less, but still a large quantity. They will continue to give milk till eight months gone with calf, or till they calve again, if you continue to milk them. This, however, should never be done; it exposes the health of cows at the time of calving, and injures the young. From this there is a gradual diminution in the quantity of milk through the orders, down to the eighth.

Cows of this order (fig. 2), or with the marks you see in the drawing, will never yield more than about five quarts per day in their best state, and they will only continue to give milk until two months with calf: hence, these are only fit for the butcher. The intervening six in Gruenon's classification are gradually poorer than the first, and better than the last, in our cuts. The marks are but very slightly different from the above, except in size; the difference is so trifling, that any one can at once see that they belong to this class;—and the comparative size of this mark will show, infallibly, their value compared with the above. In the intermediate grades, the spots (E, E, fig. 1) are smaller, and as the orders descend, these spots are wanting, and some slight changes in the form of the whole mark are observed, yet the general outline remains the same. Now, as the decrease in the eight orders in each class is about from two and a half to three or three and a half quarts, no man with eyes need be deceived in buying a cow, or raising a calf, in the quantity of milk she may be made to give. Any man can tell, within one or two quarts, the yield of any cow or heifer. The only chance for mistake is in the case of bastard-cows, which rapidly dry up on getting with calf.

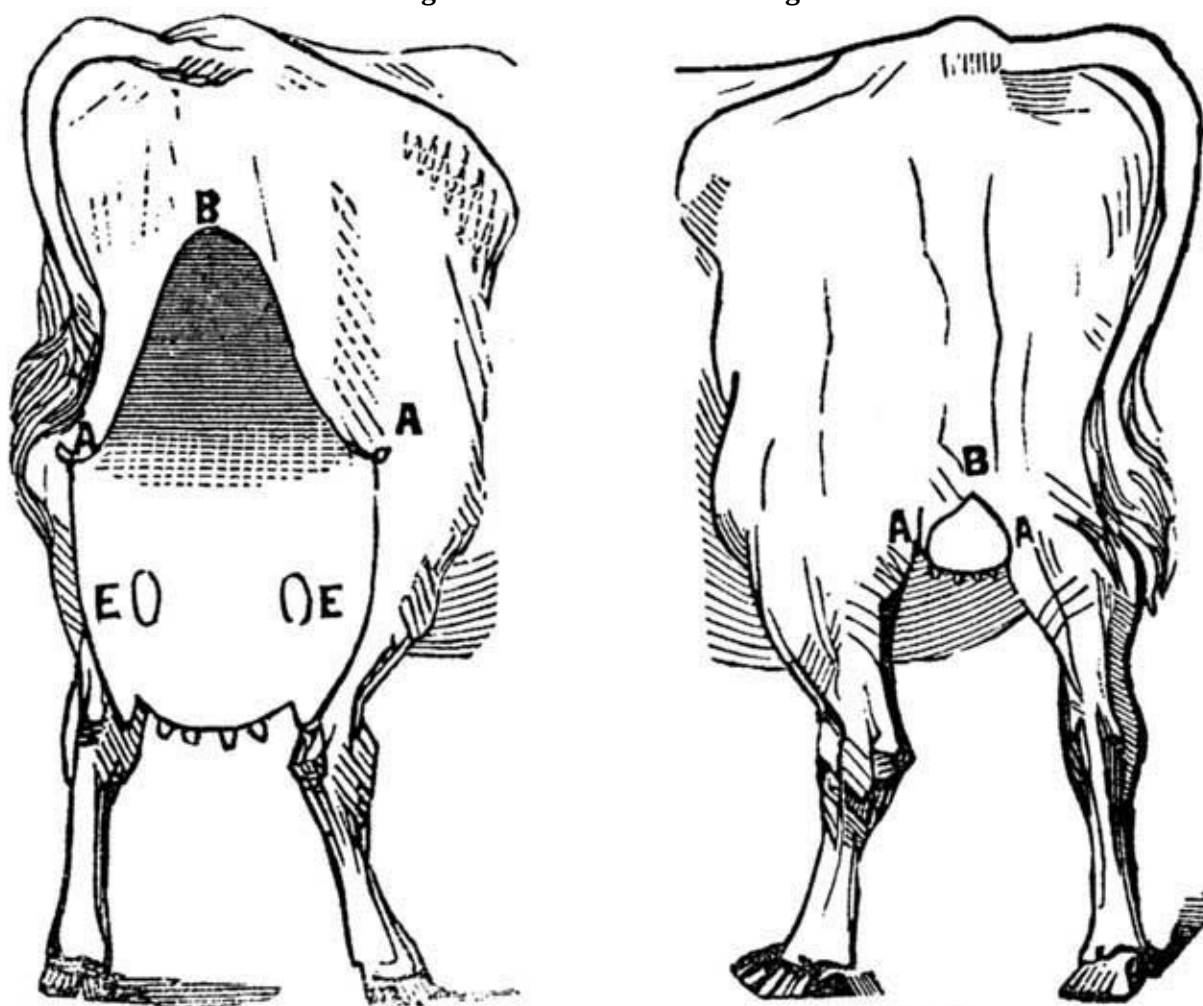
Fig. 3. SECOND CLASS. Fig. 4.



Order 1. Selvage Cow. Order 8.

In this class, the shape of the escutcheon is entirely distinct, so that no one will confound it with the first. The gradations are the same as in the preceding, only this class, all through, is inferior to the other. The first (fig. 3) will give only twenty or twenty-one quarts, and the poorest only four quarts. This escutcheon is formed by ascending hair, but with a very different outline from the first class; it has the same spots above the hind teats as the first, formed by descending hair. In the lower orders these disappear—first one, then one small one, and then none at all—and as they descend, similar spots appear, formed in the same way, on one or both sides of the vulva (F, fig. 3). The skin of the inside surface of the thigh is yellowish. The time of giving milk—viz., eight months gone with calf, or as long as you continue to milk them—is the same as in the first class. The last order (fig. 4) of this class give very little milk after getting with calf.

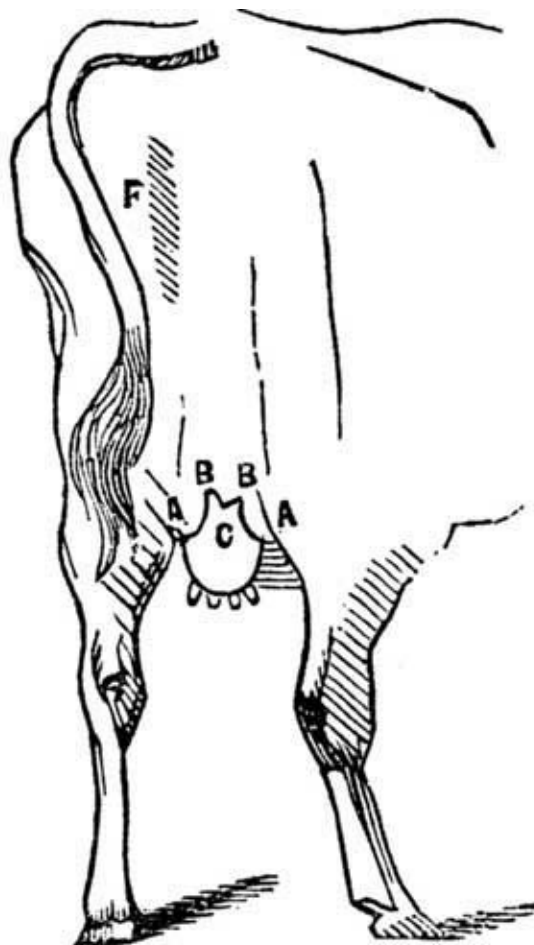
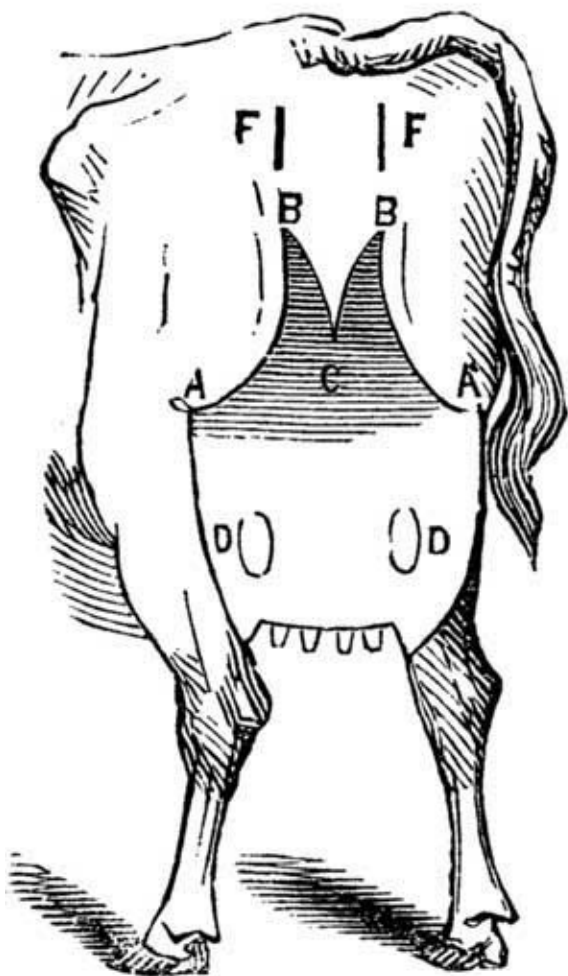
Fig. 5. THIRD CLASS. Fig. 6.



Order 1. Curveline Cow. Order 8.

This escutcheon is easily distinguished from the others, by its outline figure. The spots on the bag above the hind teats are formed as in the preceding, and as gradually disappear in the lower orders. In those orders there is a slight difference in the outline, but its general form is the same. The first of this class (fig. 5) yields twenty or twenty-one quarts a day, and gives milk till within a month of calving. The last order of the class (fig. 6) gives only three and a half quarts, and goes dry on getting with calf. The intermediate gradations between the first and eighth orders are the same as in the preceding classes.

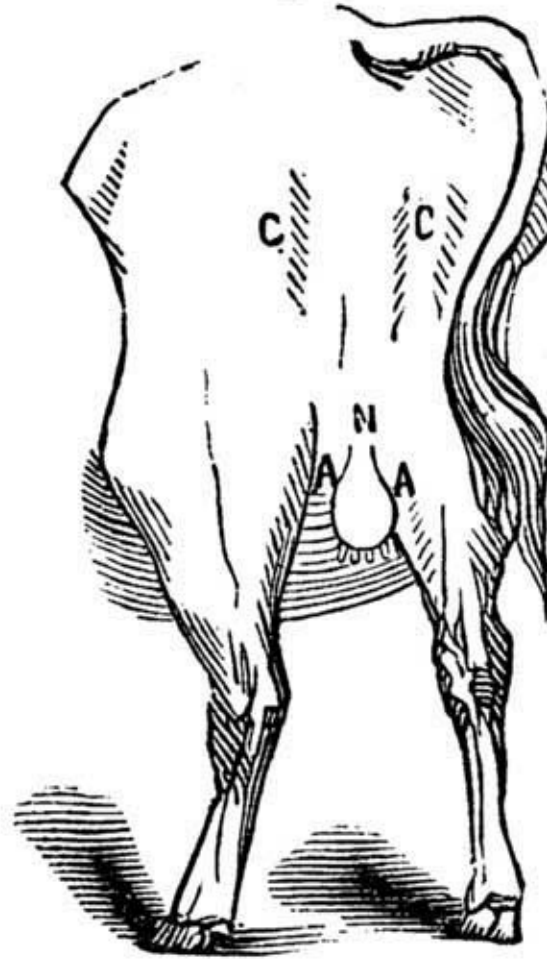
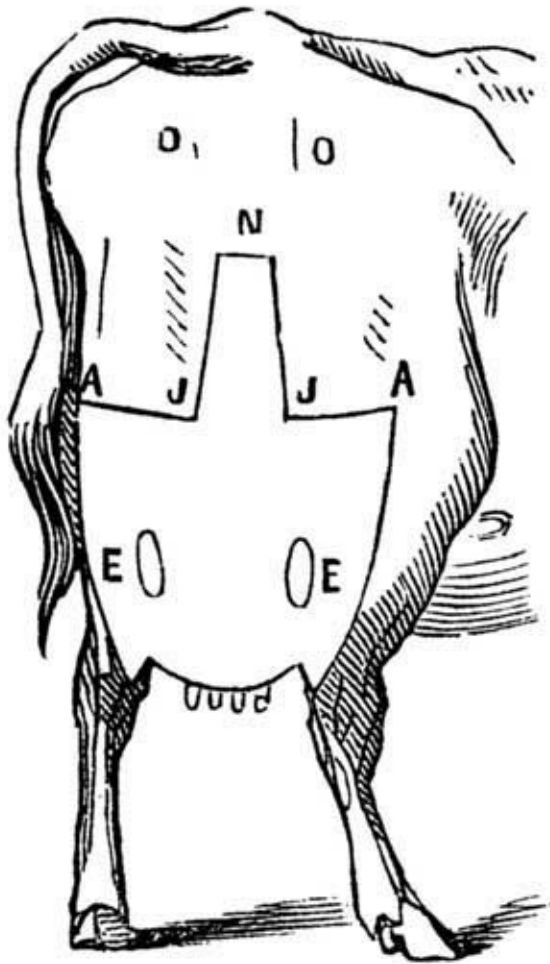
Fig. 7. FOURTH CLASS. Fig. 8.



Order 1. Bicorn Cow. Order 8.

These escutcheons are unmistakably diverse from either of the others; gradations, from first to eighth orders, the same. The first order in this class (fig. 7) will give eighteen quarts a day, and give milk until eight months with calf. The dandruff which detaches from the skin within the escutcheon of the first order is yellowish or copperish color. The two marks on the sides of the vulva are narrow streaks of ascending hair, not in the general mark. The last order of the class (fig. 8) gives three and a half quarts only a day, and goes dry when with calf.

Fig. 9. FIFTH CLASS. Fig. 10.



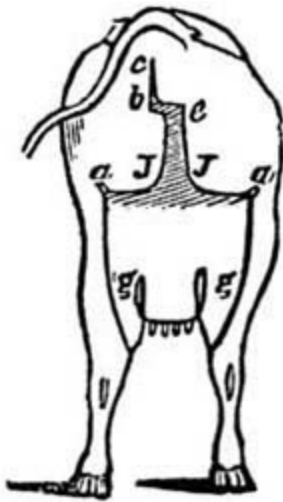
Order 1. Demijohn Cow. Order 8.

Here is another general mark, easily distinguishable from all the others by its outline. The first order (fig. 9) will give eighteen quarts a day, and give milk eight months, or within a month of calving. Yellowish skin; delicate bag, covered with fine downy hair, as in the higher orders of all the preceding classes. The eighth order of this class (fig. 10) will give only two and a half quarts per day, and none after conceiving anew. The gradation from first to eighth order is regular, as in the others.

SIXTH CLASS.

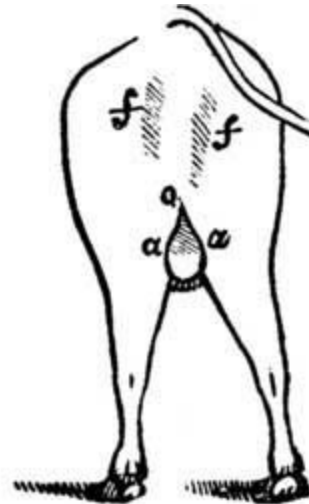
Yield of first order (fig. 11) eighteen quarts per day; time, eight months. Skin within the escutcheon same color, bag equally delicate, and hair fine, as in all the first orders. Eighth order (fig. 12) yields about two quarts per day, and dries up on getting with calf.

Fig. 11. Fig. 12.



Order 1. Square Escutcheon Cow. Order 8.

Fig. 13. SEVENTH CLASS. Fig. 14.



Order 1. Limousine Cow. Order 8.

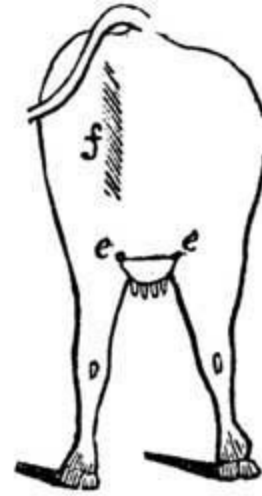
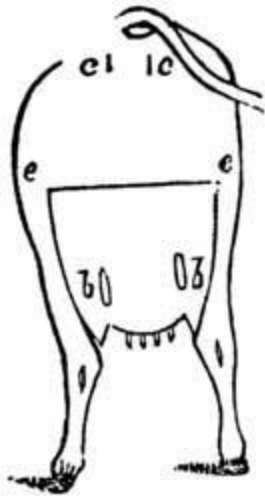
First order in this class (fig. 13) gives fifteen quarts; time, eight months. The skin, bag, and hair, same as in the higher orders in all the classes. The eighth order (fig. 14) will yield two and a half quarts per day, and dry up when with calf.

EIGHTH CLASS.

First order (fig. 15) will give fifteen quarts per day; time, eight months. Skin in escutcheon reddish-yellow and silky, hair fine, teats far apart. The eighth

order (fig. 16) yields two and a half quarts a day, and dries up on getting with calf.

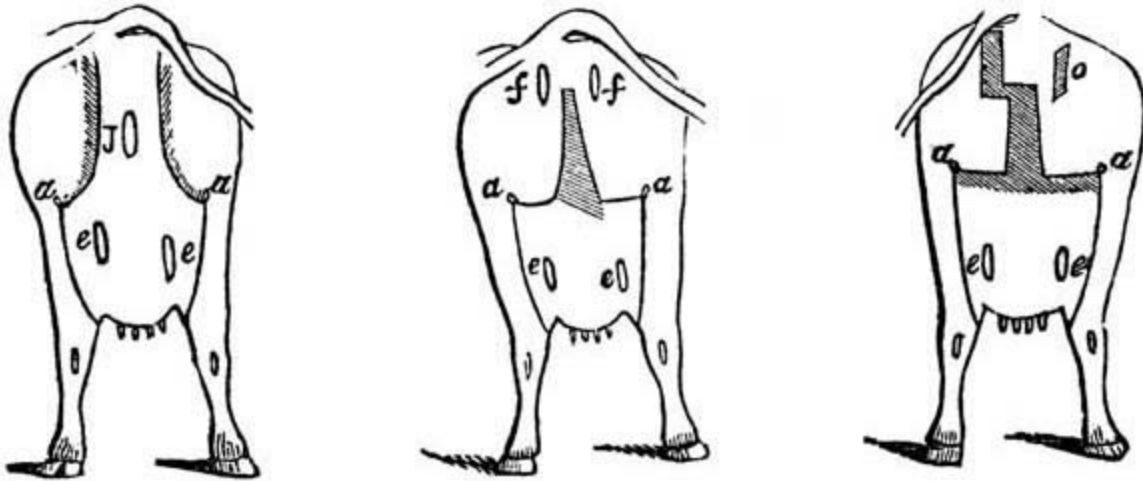
Fig. 15. Fig. 16.



Order 1. Horizontal Cut Cow. Order 8.

Each class of cows has a kind called bastards, among those whose escutcheons would otherwise indicate the first order of their class: these often deceive the most practised eye. The only remedy is to become familiar with the infallible marks given by Guenon by which bastards may be known. This defect will account for the irregularity of many cows, and their suddenly going dry on becoming with calf, and often for the bad quality of their milk. They are distinguished by the lines of ascending and descending hair in their escutcheon.

Fig. 17. Fig. 18. Fig. 19.



In the **FLANDERS COW** (fig. 17) there are two bastards; one distinguished by the fact that the hair forming the line of the escutcheon bristles up, like beards on a head of grain, instead of lying smooth, as in the genuine cow; they project over the intersection of the ascending and descending hair in a very bristling manner. The other bastard of the **FLANDERS COW** is known by having an oval patch of downward growing hair, about eight inches below the vulva, and in a line with it; in the large cows it is four inches long, and two and a half wide, and the hair within it always of a lighter color than that surrounding it. Cows of this mark are always imperfect. In the bastards, the skin on the escutcheon is usually reddish; it is smooth to the touch, and yields no dandruff.

Bastards of the **SELVAGE COW** are known by two oval patches of ascending hair, one on each side of the vulva, four or five inches long, by an inch and a half wide (fig. 18). The larger the spot, and the coarser the hair, the more defective they prove, and vice versa.

Bastards of the **CURVELINE COW** are known by the size of spots of hair on each side of the vulva (fig. 18). When they are of four or five inches by one and a half, and pointed or rounded at the ends, they indicate bastards. If they be small, the cow will not lose her milk very rapidly on getting with calf.

Bastards of the **BICORN COW** are indicated precisely as in the preceding—by *the size* of the spots of ascending hair, above the escutcheon and by the sides of the vulva (F, F, fig. 18).

Bastards of the **DEMIJOHN COW** are distinguished precisely as the two preceding—*size of the streaks* (fig. 18).

The SQUARE ESCUTCHEON COW indicates bastards, by a streak of hair at the right of the vulva (fig. 19). When that ascending hair is coarse and bristly, it is a sure evidence that the animal is a bastard.

LIMOUSINE COWS show their bastards precisely as do the CURVELINE and BICORN, by the size of the ascending streaks of hair, on the right and left of the vulva. (Fig. 19.)

Bastards of the HORIZONTAL CUT COWS have no escutcheon whatever. By this they are always known.

Some bastards are good milkers until they get with calf, and then very soon dry up. Others are poor milkers. Those with coarse hair and but little of it, in the escutcheon, give poor, watery milk. Those of fine, thick hair will give good milk.

BULLS have escutcheons of the same shape as the cows, but on a smaller scale. Whenever there are streaks of descending hair bristling up among the ascending hair of the escutcheon, rendering it quite irregular and rough in its appearance, the animal is regarded as a bastard. Never put a cow to any bull that has not a regular, well-defined, and smooth escutcheon. This is as fully as we have room to go into M. Guenon's details. We fear this will fall into the hands of many who will not take the pains to master even these distinctions. To those who will, we trust they will be found plain, and certain in their results. From all this, one thing is certain, and that is of immense value to the farmer: it is, that on general principles, without remembering the exact figure of one of the indications above given, or one of the arbitrary terms it has been necessary to use, any man can tell the quality and quantity of milk a cow will give, and the time she will give milk, with sufficient accuracy to buy no cow and raise no heifer that will not be a profitable dairy cow, if that is what he desires. The rules by which these things may be known are the following:

No cow, of any class, is ever a good milker, that has not a large surface of hair growing upward from the teats and covering the inner surface of the thighs, and extending up toward or to the tail.

No cow that is destitute of this mark, or only has a very small one, is ever a good milker. Every cow having a scanty growth of coarse hair in the above mark will only give poor, watery milk; and every cow having a thick growth

of fine hair on the escutcheon, or surface where it ascends, and considerable dandruff, will always give good rich milk, and be good for butter and cheese.

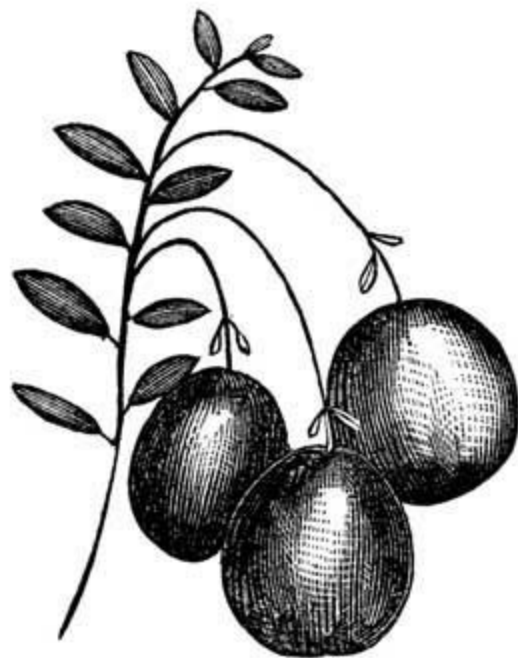
Every cow on which this mark is small will give but little milk, and dry up soon after getting with calf, and is not fit to be kept.

Observe these brief rules, and milk your cows *at certain hours every day*—milk *very quickly*, without stopping, and *very clean*, not leaving a drop—and you never will have a poor cow on your farm, and at least twenty-five per cent. will be added to the value of the ordinary dairy, that is made up of cows purchased or raised in the usual, hap-hazard way.

If your cows' udders swell after calving, wash them in aconite made weak with water; it is very good for taking out inflammation. Other common remedies are known. If your cow or other creature gets choked, pour into the throat half a pint, at least, of oil; and by rubbing the neck, the obstruction will probably move up or down. Curry your cows as thoroughly as you do your horses; and if they ever chance to get lousy, wash them in a decoction of tobacco.

CRANBERRY.

This is native in the northern parts of both hemispheres. In England and on the continents of Europe and Asia, native cranberries are inferior, in size and quality, to the American. Our own have also been greatly improved by cultivation. They have become an important article of commerce, and find a ready sale, at high prices, in all the leading markets of the country. Their successful cultivation, therefore, deserves attention, as really as that of other fruits. Mr. B. Eastwood has written a volume on the subject, which probably contains all the facts already established, together



with many opinions of scientific and practical cultivators. The work is valuable, but much less so than it would have been, had the author put into a few pages the important facts, and left out all speculations and diversities of opinion. The objection to most of this kind of literature is the intermixture of facts and valuable suggestions with so much that is not only useless, but absolutely pernicious, by the confusion it creates. We think the following directions for the cultivation of the cranberry are complete, according to our present knowledge:—

Soil.—It is universally agreed that *beach sand* is the best. Not from the beach of the ocean barely, but of lakes, ponds, or rivers. There is no evidence that any saline quality that may be in sand from the beach of the sea, is particularly useful. It is the cleanness of the sand, on which account it is less calculated to promote a growth of weeds, and allows a free passage of moisture toward the surface. Hence white sand is preferable, and the cleaner the better. Whoever has a moist meadow in the soil of which there is considerable sand has a good place for a cranberry bed. If you have not a sand meadow, select a plat of ground as moist as any you have, upon which water will not stand unless you confine it there, and draw on sand to the depth of four or six inches, having first removed any grass or break-turf, that may be in danger of coming up as weeds to choke the vines. If you make the ground mellow below and then put on the sand, you will have a bed that will give you but little further trouble. Peat soils will do, if you take off the top and expose to the weather, frosts and rains, one year before planting. The first year, peat will dry and crack, so as to destroy young cranberry vines. But after one winter's frost, it becomes pulverized and will not again bake. Hence it is next to sand for a cranberry bed.

Situation.—The shore of a body of water, or of a small pond is best, if it be not too much exposed to violent action of wind and waves. Land that retains much moisture within a foot of the surface, but which does not become stagnant, is very valuable. The bottoms of small ponds that can be drained off are very good. Any land that can be flowed with water at pleasure is good. By flooding, the blossoms are kept back till late spring frosts are gone. Any upland can be prepared as above. But if it be a very dry soil it must have a liberal supply of water during dry weather, or success may not be expected.

Planting.—There are several methods. Sod planting consists in preparing the

land and then cutting out square sods containing vines, and setting them at the distances apart, you desire. This was the general method; but it is objectionable, on account of the weeds that will grow out of the sod and choke the vines. This method is improved by tearing away the sod, leaving the roots naked, and then planting. Another method is to cut off a vigorous shoot, and plant the middle of it, with each end protruding from the soil two or three inches apart. Roots will come out by all the leaves that are buried, and promote the springing of many new vines, and thus the early matting of the bed which is very desirable.

Others take short slips and thrust four or five of them together down into the soil as they do slips of currant bushes, thus making a hill of as many plants. And yet another method is, to cut up the vines into pieces of two or three inches in length, and broad cast them on mellow soil, and harrow them in as wheat—Others bury the short pieces in drills. In either case they will soon mat the whole ground, if the land be not weedy. The best plan for small beds is probably the middle planting.

Distances apart depend upon your design in cultivating. If your soil is such that so many weeds will grow as to require cultivating with a horse, or much hoeing, four feet one way and two the other is the best. Better have land so well covered with clean sand, that very few weeds will grow and no cultivation be needed. Then set vines one foot apart and very soon the whole ground will be perfectly matted and will need very little care for years. For two or three years pull out the weeds by hand, and the ground will be covered and need nothing more.

Varieties.—There are three principal ones of the lowland species. The bell, the bugle, and the cherry cranberries. These are named from their shape. Probably the cherry is the best, being the size, shape, and color of the cultivated red cherries. There has recently been discovered an upland variety, on the shores of Lake Superior, that bids fair to be as hardy and productive as the common currant. On all poor, hard, and even very dry uplands, it does remarkably well. It grows extensively in the northern part of the British provinces. The fruit is smaller than the other varieties but is delicious, beautiful in color, and very abundant. It will probably be one of our great and universal luxuries.

Healthy and Unhealthy Plants.—By this cultivators denote those that bear well and those that do not. And yet the unhealthy, or those that bear the least, are the larger, greener-leaved, and rapid-growing varieties. It is difficult to describe them so that an unpractised eye would know them from each other. The best way to be sure of getting the right kind is to purchase of a man you can trust, or visit the beds when the fruit is in perfection and witness where the crop is abundant, mark it, and let it remain until you are ready to plant. This is always best done in the spring, or from May 15th to June 15th.

Gathering—is performed by hand, or with a cranberry-rake. Hand-picking is best for the vines, but is more expensive. If a rake be used, it will draw out some small runners and retard the growth of young vines. But it is such a saving of expense, it had better be used, and always drawn the same way. The fruit should be cleared of leaves and decayed berries; and if intended for a near market, be packed dry in barrels. If to be transported far, put them in small casks, say half-barrels, with good water. They may thus be carried around the globe in good condition. To keep well they should not be exposed to fall frosts, and should not be picked before ripe. A little practice, and at first on a small scale, may enable American cultivators of the soil, generally, to have good cranberry beds. Much of the practical part of this can only be learned by experience. The above suggestions will save much loss and discouragement.

Enemies—are worms that attack the leaves, and another species that attack the berries. There are only two remedies proposed, viz., fire and water. If you can flood your beds you will destroy them. If not, take a time not very dry so as to endanger burning the roots, and burn over your cranberry-beds, so as to consume all the vines. Next season new vines will grow up free from worms.

CUCUMBERS.

There are quite a number of varieties. But a few only deserve attention. The best, for all uses, is the Early Cluster, a great bearer of firm, tender, brittle fruit. Early Frame, Long White, Turkey, and Long Green Turkey, are rather beautiful, but not prolific varieties. Long Prickly, is very good for pickles, and fills a cask rapidly, but is by no means so pleasant as the Early Cluster. The Short Prickly and White Spined are considerably used. The West India or

small Gherkin is used only for pickling, and is considered fine. But we regard all these inferior to the Early Cluster.

Soil should be made very rich with compost and vegetable mould, with a liberal application of sand. All vines do better in a sandy soil. Plant in the open air only after the weather has become quite warm. An effort to get early cucumbers by early out-door planting is usually a failure; seeds decay, or having come up, after a long while, they grow slowly, and vines and fruit are apt to be imperfect. Six feet apart, each way, is the best distance; and after the plants get out of the way of insects, and become well established, two vines in each hill is better than more: the fruit will be better and more abundant, and they will bear much longer than when vines are left to grow very thick. They need water in dry weather (see Watering). The first week in July is the best time to plant for pickling. In a warm, dry climate, cucumbers do better a little shaded, but not too much. Planted among young fruit-trees, or in alternate rows with corn, they do well. If allowed to run up bushes like peas, they produce more and better fruit. Forcing for an early crop is often done, by digging a hole in the ground, two feet deep and two feet square, and filling with hot manure, stamped down well, and covered with six inches of fine mould. Put around a frame and cover with glass, at an angle of thirty-five degrees to the sun. Plant one hundred seeds on the two feet square; when they come up, put two plants in a pot, set in a regular hotbed, and keep well watered and aired until the weather be warm enough to transplant in the open air; then remove from the pots without breaking the ball of earth, and plant six feet apart. Four plants left in the original hill will bear earlier than those that have been removed. To get a large quantity of very early ones, plant a corresponding number of hills, with the two feet of manure, as above; whenever the weather becomes hot, they will need to be well watered, or they will dry up. All cucumber-plants forced should have the main runner cut off, after the second rough leaf appears; this brings fruit earlier and twice as abundant. On transplanting cucumbers, or any other vines, cover them wholly from the sun for three days, or, if the weather be dry, for a whole week. We once thought melons and cucumbers very difficult to transplant successfully; but we ascertained the only difficulty to be, the want of sufficient water and shade. When roots and soil were so dry that the dirt all fell off, we have transplanted with perfect success; but for a week the plants appeared to be ruined. We kept them covered and well watered, and they revived and made a

great crop, much earlier than seeds planted at the same time. Protection of plants from insects has been a subject of much study and many experiments. Ashes and lime, and various decoctions and offensive mixtures, have been recommended. We discard them all, as both troublesome and ineffectual. Our experience is, most decidedly, in favor of fencing each hill, of all vines, to keep off insects. A box a foot square and fifteen inches high, the lower edge set in the soil, will usually prove effectual. Put over a pane of glass, and it will be more sure, and increase the warmth and consequently the growth of the plants. Put millinet over the boxes, instead of glass, and not a hill will be lost. If a cutworm chances to be fenced in, he will show himself by cutting off a plant. Search him out and kill him, and all will be safe. Such boxes, well taken care of, will last for ten years. This, then, is a cheap as well as effectual method.

Cucumbers are a cooling, healthy article of diet, used in reasonable quantities. They should be sliced into cold water, taken out, and put in sharp vinegar with pepper and salt. Ripe cucumbers make one of the best of pickles: for directions in making, we refer to the cook-books. If you have room near your back door for one large hill of cucumbers, you may obtain a remarkable growth. Dig down deep enough to set in an old barrel, with head and bottom out, leaving the top even with the surface. Fill with manure from the stable, well trod down. In fine rich mould, around on the outside of the barrel, plant twenty or thirty cucumber-seeds. Put a pail of water in the barrel every day. The water comes up through the soil to the roots of the plants, bringing with it the stimulus of the manure, and the effect is wonderful. A large barrel has been filled with pickles from one such hill. If bushes be put up to support the vines, it is still better. Neglect to pour in water, and they will dry up; but continue to water them, and they will bear till frost in autumn.

CURRENTS.

These are among the very best of all the small fruits; immensely productive in all locations, and adapted to a great variety of uses, and hang long on the bushes after ripening.

There is quite a number of varieties, some of which are probably the mere

result of cultivation of others well known. The common red is too well known to need description—very acid, and always remarkably productive, in all soils and situations. The size and quality of the fruit are affected by location and culture. The native currants, as found in the north of Europe, are small and inferior; but all excellent modern varieties have sprung from them by cultivation. In working these important changes, the Dutch and French gardeners have been the chief agents: hence our names, Red and White Dutch currants.

The common red and the common white are still cultivated in the great majority of American gardens; and yet, they are not worthy to be named with the White Dutch and the Red Dutch, which may easily be obtained by every cultivator. These two varieties are all that ever need be cultivated. Long lists of currants are described in many of the fruit-books; the result, as in all such cases, is confusion and loss to the mass of growers. We will not even give the list. The common red and the white currants are greatly improved by cultivation. But the Dutch have longer bunches, of larger fruit, the lower ones in the stem holding their size much better than common currants; the stems are usually full and perfect, and the fruit less acid and more pleasant.

A new, strong-growing variety, called the "cherry currant" on account of its large size, is now considerably grown. A few bushes for variety, and for their beautiful appearance, may be well enough; but it is not a very good bearer, and therefore is not so profitable as the Dutch.

The Attractor is a new French variety, said to be valuable. Knight's Early Red has the single virtue of ripening a few days earlier than the others. The Victoria is perhaps the latest of all currants, hanging on the bushes fully two weeks longer than others. The White Grape, the Red Grape, and the Transparent, are all good and beautiful. The utilitarian will cultivate the Red Dutch and the White Dutch as his main crop, with two or three of the others for a variety. The amateur will get all the varieties, and amuse himself by comparing their qualities, and trying his skill at modifying them. As these efforts have resulted, in past time, in the production of our best varieties, so they may, in future, in something far better than we yet have. There is no probability that any of our fruits have reached the acme of perfection.

The common black, or English black currant has long been cultivated. A jam

made of it is valuable for sore throat. The highest medical authority pronounces black currant wine the best, in many cases of sickness, of any wine known. The Black Naples possesses the same virtues, and being a much larger fruit, and more productive, should take the place of the English black, and exclude it from all gardens.

Cultivation.—Currant-bushes should be set four feet apart each way, and the whole ground thoroughly mulched; it keeps down all weeds and grass, saving all further labor in cultivation, and greatly increases the size and quantity of the fruit. On nothing does mulching pay better. (See article *Mulching*.)

Any good garden-soil is suitable for currants. On the north side of a wall or building, or in the shade of trees, they will be considerably later. The same effect may be produced by covering bushes a part of the time with blankets or mats. Some are retarded by this means, so as to be in perfection after others are gone: thus, the currant that naturally comes to perfection about midsummer is preserved on the bushes until October.

Many cultivate currants in the tree form; allowing no sprouts from the roots, and no branches within a foot or two of the ground. This object is secured by cutting from the slip you are to plant, from which to raise a bush, all the lower buds to within two or three of the top, and then pinching off at once all shoots that may start out of the stem below; this makes beautiful little shrubs, but the top is apt to be broken off by the wind, and they must be replaced by new ones every four or five years. Downing strongly recommends it, but we can not do so. Let bushes grow in the natural way, removing all old, decaying branches, and all suckers that rise too far from the parent-bush, and keep the clusters of bushes and leaves thin enough to allow the sun free access, and prevent continued moisture in wet weather, which will rot the fruit, and you will find it the cheapest and best. We have seen quite as large and as fine fruit grow on such bushes, that we knew to be more than twenty years old, as we ever saw of the same variety when cultivated in the tree form.

DAIRY.

For cheese, the dairy should contain three rooms: one for setting the milk, with suitable boilers, &c.; next, a press-room, in which the cheese should be salted, as given under article *Cheese*; the third, a store-room. In all climates a

cheese-house should be made as tight as possible;—thick stone walls are best; windows should be on two sides, north and west, but not on opposite sides, so as to create a draught: this is no better for cheese or butter, and is always dangerous to the operator. Let all persons who would enjoy good health avoid a draught of air as they would an arrow. If your cheese-house can be shaded on the east, south, and west, by trees, and have only a northern exposure, it will aid you much in guarding against extremes of heat and cold. Windows should be fitted closely, and covered with wire-cloth on the outside, so as to exclude all flies.

A dairy for butter needs but two rooms, and a cool, dry cellar, with windows in north and west. The first room should be for setting and skimming the milk, and the other for churning and working the butter, and scalding and cleaning the utensils. If your milk-room can be a spring-house with stone-floor, and a little water passing over it, you will find it a great benefit. The shade, situation of windows, avoiding a current, &c., should be the same as in the cheese-dairy.

To prevent the taste of turnips or other food of cows in milk and butter, put one quart of hot water into eight quarts of the milk just drawn from the cow, and strain it at once. It has been recently declared, by intelligent farmers, that if you feed the turnips to cows immediately after milking, the next milking, twelve hours after feeding the roots, will be free from their taste or odor. The easiest remedy is the boiling water.

DECLENSION OF FRUITS.

That there are instances of decided decline in the quality of fruits is certain. But on the causes of those changes pomologists do not agree. One theory is, that fruits, like animals and vegetables of former ages, may decline and finally become extinct. Should this theory be established, the declension would be so gradual that a century would make no perceptible change. But we do not credit the theory, even as applied to former geological periods in the history of our globe. The changes of past ages, as revealed in geology, have been brought about, not gradually, but by great convulsions of nature, such as volcanoes, or the deluge, that resulted in the destruction of the old order of things, and in a new creation.

The true theory of this declension of varieties of fruits, is, that it is the result of repeated budding upon unhealthy stocks, and of neglect and improper cultivation. Apply the specific manures—that is, those particularly demanded by a given fruit—prune properly, mulch well, and bud or graft only on healthy seedling stocks of the same kind, and, instead of declension, we may expect our best fruits to improve constantly, in quality and quantity.

DILL.

An herb, native in the south of Europe, and on the Cape of Good Hope. It is grown, particularly at the South, as a medicinal herb. The leaves are sometimes used for culinary purposes; but it is principally cultivated for its sharp aromatic seed, used for flatulence and colic in infants, and put into pickled cucumbers to heighten the flavor. The seeds may be sown early in the spring, or at the time of ripening. A light soil is best. Clear of weeds, and thin in the rows, are the conditions of success.

DRAINS.

Drains are of two kinds—under-drains and surface-drains. The latter are simply open ditches to carry off surface-water, that might otherwise stand long enough to destroy the prospective crop. These are frequently useful along at the foot of hills, when they should be proportioned to the extent of the surface above them. They are also very useful on low, level meadow-lands. Properly constructed, they will reclaim low swamps, and make them excellent land. Millions of acres of land in the United States, as good as any we have, are lying useless, and spreading pestilence around, that by this simple method of ditching might be turned to most profitable account. The direction of these drains should be determined by the shape of the land to be drained by them—straight whenever they will answer the purpose, but crooked when they will do better. On low and very level land, they should be not more than five rods apart; they should be three times as wide at the top as they are at the bottom, and as deep as the width at the top; made so slanting, the sides will not fall in;—they should be so shaped as to allow only a very gentle flow of the water: if it flows too rapidly, it will wash down the sides, and obstruct the ditch, and waste the land. Excavations for under-draining are

made in the same way, only the top need not be so much wider than the bottom; it would be a waste of labor in excavating a useless quantity of earth. There are four methods of filling up the ditch, viz., with brush; with small stones thrown in promiscuously; with a throat laid in the bottom and filled with small stones; and with a throat made of tile from the pottery. In all cases, that with which the ditch is filled must not come so near the surface as to be reached by the plow. Brush, put in green and covered with straw or leaves, will answer a good purpose for several years, and may be used where small stones can not easily be obtained. The tile is more expensive than either of the others, and not so good as the stones; it is so tight that the water does not enter it so readily; and if by any chance dirt gets into the throat, it obstructs it, and there is no other channel through which the water can pass off. Small stones thrown in promiscuously serve a good purpose for a long time, if they be covered with straw or cornstalks before the earth is put in. But the best method is to make a throat, six inches square, in the bottom of the drain, laying the large stones over the top of it, and filling in the small stones above, and covering with straw;—the water will find its way into the throat through the numerous openings; and if the throat should ever be filled, the water could still pass off between the small stones above. Such drains will last many years, and add one half to the products of all wet springy land. The earth over the new drain should be six inches higher than the surface of the field, that, when well settled, it may be level. Leave no places open for surface-water to run in; that would soon fill up and ruin a drain. Drains made to carry off spring-water are often useless by being in a wrong location. Springs come out near the foot of rising ground. Just where they come out should be the location of the drain, which would then carry off the water and prevent it from saturating and chilling the soil in the field below. Many persons locate their ditch down in the centre of the wet level below the rise of ground; this is of no use to the surface above, to the point where the water springs. Locate the drain just at the point where the land begins to be unduly wet. On very wet, level land, a small drain may also be needed below the first and main one. The cost of a covered drain as described above will be from fifty to seventy-five cents per rod, and an uncovered one will cost from twenty to thirty cents. When you have low swamps to drain, you can realize more than the cost of draining, by carting the excavations upon other land, or into the barnyard as material for compost. Perhaps no expenditure, on land needing it, pays so well as thorough draining. It is important, for all fruit-

orchards on low land, to put a drain through under each row of trees: it is indispensable to cherries, and highly favorable to all other fruits.

DUCKS.

There are a number of varieties, the wild Black Spanish, the Canvass-Back, and the ordinary little duck of the farmyard, are all good. The common duck is the only one we recommend for the American poultry-yard. A close pasture, including a rivulet, or a small stream of water, affords facilities for raising ducks at a cheap rate. From one hundred to one thousand ducks may be raised in such an enclosure of an acre or two, quite profitably. If there is plenty of grass, they will still need a little grain. In the winter the cheapest feed is beets or potatoes cut fine, with a very little grain. Each duck, well kept, will lay from fifty to one hundred eggs, larger than hen's eggs, and about as good for cooking purposes. They may be picked as geese, for live feathers, though not quite so frequently. The feathers will nearly pay for keeping, leaving the eggs and increase as profit.

DWARFING.

This has some advantages in its application to fruit-trees. It will enable the cultivator to raise more fruit on a small plat of ground, to get fruit much earlier than from standard trees, and sometimes, with high cultivation, the fruit will be larger. Dwarfing is done by grafting into small slow-growing stocks. Almost all fruits have such kinds. Grafting into other stocks, as the pear into the foreign quince, is a very effectual method. The Paradise stock for the apple, the Canada and other slow-growing stocks for the plum, the dwarf wild cherry of Europe and the Mahaleb for cherries. Dwarfs produced by grafting upon other stocks are short-lived, compared with standards of the same varieties. They should only be used to economize room, to test varieties, and produce fruit while standards are coming into bearing.

Better and much longer-lived dwarfs may be produced by frequent transplanting, thorough trimming of the roots, and repeated heading-in. The fruit on such dwarfs must be well thinned out when young, or it will be smaller than is natural. The effect of heading in is to cause the sap to mature an abundance of fruit-buds. This will tax the tree too much, unless they be

well thinned out. Root-pruning is an effectual method of dwarfing (see Pruning). Dwarfing by root-pruning, repeated transplanting, and thorough heading-in, will not render the trees very short-lived, and in many situations it is profitable. The same is true of the dwarf pear on the quince. All other dwarfing is more for the amateur than the utilitarian.

EARLY FRUITS AND VEGETABLES

Are often considered a great luxury, and always command a high price. Early vegetables are secured by hotbeds and the various methods of forcing, as given under the different species. Early fruits are obtained by dwarfing, as given on that subject. Location, soil, and mode of cultivation, also, have much to do with it. Warm location, finely-pulverized soil, often stirred and kept moist, will materially shorten the time of the maturity of fruits and vegetables. Seeds imported from the North, where seasons are shorter, will mature earlier. Another means of hastening maturity is to plant successively, from year to year, the very first that ripens; this tends to dwarf in proportion as the time of maturity is hastened. In this way such dwarfs as the little Canada corn, that will mature at the South in six weeks, have been produced. Various early plants, as tomatoes, cabbages, peppers, and egg-plants, may be started in boxes or flower-pots in the house. Planted in February here, or in January in the South, they will grow as well as house-plants, and acquire considerable size before it is time to place them in the open ground. This is convenient for those who have no hotbeds. They must be kept from frost, and occasionally set out in a warm day to harden, and they will do well.

EGG PLANT.

The white is merely ornamental. The large purple is one of the greatest luxuries of the vegetable garden. Plant seeds in hotbed at the time of planting tomatoes or peppers. Set out in land made very rich with stable-manure and decayed forest-leaves, two feet and a half apart each way. Kept clean, and earthed up a little, and the bugs kept off while the plants are small, they will produce an abundance of fruit. There are two varieties of the purple—*large prickly-stem purple*, growing sometimes eight inches in diameter; and the *long purple*, bearing smaller, long fruit, but a large quantity, and considerably

earlier than the large. Many do not like them at first; but after tasting a few times, almost all persons become very fond of them. If not properly cooked, they are not at all palatable. Although it belongs to the cook-book, yet, to save this excellent plant from condemnation, we give a recipe for cooking it. It is fit for use from one third grown, until the seeds begin to turn. Without paring, cut the fruit into slices one third of an inch thick; put it in a little water with plenty of salt, and let it stand over night, or six hours at least; take it out, and fry very soft and brown in butter or fresh lard—if not fried soft and brown, it is disagreeable. Salt, ashes, and bonedust, or superphosphate of lime, are the best manures, as more than two thirds of the fruit is made up of potash, soda, and phosphates, as shown by chemical analysis.

EGGS.

Of the quality of eggs you can always judge correctly by looking at them toward the light: if they are translucent they are good; if they look dark they are old—or you may get a chicken, when you only paid for an egg.

Many methods for preserving eggs are recommended. Packed away in fine salt they will keep, but, like salt meat, have not the same flavor as fresh. Set them on their small ends in a tight cask, and fill it with pure lime-water, and they will keep, but it changes their flavor. This, however, is a very common method. The best way known to us, is to pack fresh eggs down in Indian meal, allowing no two to touch each other. Keep very dry in a cool cellar, and they will remain for months unchanged.

ELDERBERRY.

This is a healthy berry, dried and used for making pies, especially mixed with some other fruit. The blossoms are much used as medicine for small children. The common sweet elder is the only kind cultivated. The earlier red are offensive and poisonous. They are easily grown on rough waste land, or in any situation you prefer. Of this berry is made a wine, superior in flavor and effect to any port wine now to be obtained in market; it has had the preference among the best judges in the country;—it is fast coming into notice and cultivation. The wine is so entirely superior to the poisonous substances of that name in commerce, that it would be well for every

neighborhood to make enough for their sick. The process is sure and easily intelligible to all. (See article Wine.)

ENDIVE.

This is a well-known winter-lettuce. Sow from July to September, according to latitude. It should come into maturity at the time of the first smart frosts. To get beautiful, white, tender bunches, they should be tied up when the leaves are about six inches long. When frost comes, protect by covering. In very cold climates, place it in the cellar, with the roots in moist earth, and it will keep for a long time. It will not be extensively used in this country for soups and stews, as it is in Europe; and but few of the American people care much about winter-lettuce. This is the best variety of lettuce, except for those who have hot-houses and attend to winter-gardening. They will prefer the other finer varieties. There are two varieties of endive cultivated in this country: *green curled*, which is the most common, and used principally as a salad; the *broad-leaved*, or Batavian, has thicker leaves and large heads, and is principally used in stews and soups. Still another variety, called *succory*, which is used to some extent in Europe as a winter-salad, but is cultivated mainly for the root. It is dried and ground to mix with coffee: some consider it quite as good. This is more cultivated at the South than at the North—their winters are much better adapted to it. The medicinal virtues of this plant are nearly equal to those of the dandelion. When it is bleached, by tying or earthing up, the bitterness is removed, and the taste is pleasant; this must be done when the plants are dry, or they will rot. Plant them in a sunny place and in a light soil.

FEEDING ANIMALS.

Feed as nearly as possible at the same hours. All creatures do much better for being so fed. Do not feed domestic animals too much: animals will be more healthy, grow faster, and fatten better, by being fed almost, but not quite as much as they will eat. Giving food to lie by them is poor economy; always let them eat it all up, and desire a little more;—at the same time, let it be remembered that creatures kept very poorly for a considerable time, especially while young, will never fully recover from it. This is often done

under the idea of keeping them cheap, but it is dear keeping. They never can make as fine animals afterward.

All grains and vegetables, except beets and turnips, are better for being boiled or steamed. The increased value is much more than the cost of cooking, provided persons are not so careless as to allow food to be injured by standing after cooking. Cooking is supposed to add one fourth to the value of food. Grinding dry grains adds nearly as much to their value, as feed for animals, as cooking. If you neither grind nor boil hard grain for feed, it will pay well to soak it somewhat soft before feeding. Variety of food is as pleasant and healthy for animals as for men.

FENCES.

These are matters of great importance to the farmers of the whole country, but especially to those on the prairies of the west.

In all localities where stone can be obtained from the fields or quarry, the best and cheapest fence is a stone wall. If the stones are flat, make the wall two feet thick at bottom, and one at top, five feet high. If the stones are very irregular the wall should be thicker. Stone walls should have transverse rows of shingles, boards, or split sticks, about half an inch thick, laid in the wall at suitable distances. If stones are quite flat three rows are desirable, one two, the next three, and the other four feet from the ground. If the wall is made of rough stones it will require one more course of sticks, leaving them only a foot apart. The sticks should be of such lengths as to come out just even with the wall, on each side. The lower courses will be longer than the upper ones. These sticks are to keep the wall from falling down. Dig a ditch one foot deep, two feet from the wall, and throw the earth excavated up against the wall, and the water will run off and prevent heaving by frost, and such a wall will need the merest trifle of attention during a generation, and will last for centuries. A cord of stones will make one rod. We can not too strongly recommend this kind of fence, in all places where stones can be obtained reasonably. The pieces of wood laid in a wall, will keep well for thirty years, when they will need replacing. Next to stone is a good board fence. Well made and of good materials, it is durable and always in its place. Hence it is a cheap fence.

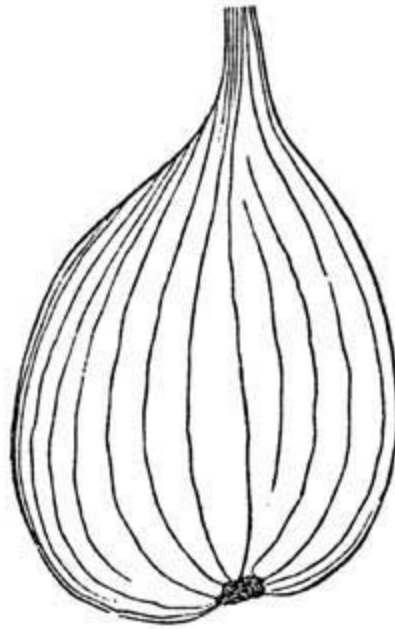
Of the various styles of picket, and other fancy fences for front yards, &c., it is more the province of the architect or the mechanic to treat. Styles vary and are constantly increasing in number. The great point to be secured in all such, to render them most durable, is to have the smallest possible points of contact. A picket fence with horizontal base should never have the pickets standing on the base board. They should be separated, from one quarter to one half an inch. A good style for villages, is a cap, water tight, and wide enough to cover the ends of the posts and pickets with a neat little cornice. It looks well and is very durable.

In all localities where timber is not too valuable, a cheap and substantial fence is made of split rails. The crooked rail-fence, with stakes and riders, is well known. Also that with upright stakes and caps, which is decidedly preferable. It will stand much longer, and the stakes are out of the way. No farmer should ever risk his crop with a rail-fence without stakes. But the best of all rail-fences, is that made of posts and rails. The rails are put in as bars, but so firmly that the fence can not be taken down, without commencing at the end. Where cedar or locust posts, and oak or cedar rails can be obtained, a fence may be made that will not get out of repair for twenty-five years. No creature can tear it down, for human hands can not take it down without tools, or without commencing at the end. This is considered expensive. But as the farmer may prepare his posts and rails in winter, and it will require no attention to keep it up, and is very durable and perfectly effectual against cattle, it is an economical fence. For hedges, see that article.

FENNEL.

This is a hardy perennial plant of Southern Europe, and belongs to both the culinary and the medicinal departments. It grows well on almost any soil, and is propagated by seeds, offshoots, or by parting the roots. It is much inclined to spread. A few roots, kept within reasonable bounds, are enough for a family. It is much used in Europe for soups, salads, and garnishes. The Italians treat it as celery. In this country it is mostly used medicinally. It is stimulant and carminative. Very beneficial to children in cases of flatulency and colic.

FIGS.



This fruit is native in the warmer parts of Asia: hence, the cold winters of the Middle, Northern, and Western states, and of Canada, would destroy the trees in the open air without protection. But as the trees are low-growing shrubs, they may easily be protected either in cellars, greenhouses, or the open air, and uncovered or planted out in the beginning of warm weather. Frequent removals and transplantings injure the fig less than any other fruit, and our summers are long enough to produce large crops of excellent figs. In New England they are raised in tubs, set out of the cellar in spring, and produce largely. South of Virginia, the fig is hardy, and may be cultivated with profit in the open air. The best method of raising all kinds of fruit, in climates where the winters are too cold for them, is to build a wall twelve feet high on one side, and six feet on the other, with the ends closed, and cover it with glass facing the south. This should only be kept warm enough to prevent freezing, which would require only a small outlay. Men of moderate means might thus have oranges, lemons, figs, &c., of their own raising. In all except our coldest latitudes, such fruits might be raised at a profit.

Soil.—The best is a deep, rich loam, with a dry subsoil.

Propagation is by layers and cuttings. The latter should be taken off in the spring, be of last year's growth, with half an inch of the previous year's growth: they take root better.

Varieties are numerous, and names uncertain. White, in his *Gardening for the South*, says, some of the best varieties are not in the books, or so imperfectly described that they can not be recognised. This is true of all the fruits, and hence our decision, in this work, not to attempt to describe fruits with a view to their identification. As this fruit is more for the South than the North, we give the whole of White's list, as being adapted to those regions:—

1, Brunswick; 2, Brown Turkey; 3, Brown Ischia; 4, Small Brown Ischia; 5, Black Genoa; 6, Celestial; 7, Common Blue; 8, Round White, Common White, Lemon Fig; 9, White Genoa, White Italian; 10, Nerii; 11, Pregussatta; 12, Allicant; 13, Black Ischia; 14, White Ischia. These, with a few others, are those described in most of our fruit-books. The catalogue of the London Horticultural Society enumerates forty-two varieties. Only a few of them have been introduced into this country. Any of these varieties are good at the South. The five following are the most hardy, and, being in all respects good, are all we need in our more northern latitudes:—

1. *Brunswick*.—Very hardy, productive, and excellent.

2. *Brown Turkey*.—The very hardiest, and one of the most regular and abundant bearers.

3. *Black Ischia*.—Bears an abundance of medium-sized, excellent fruit, very dark-colored.

4. *Nerii*.—Said to be the richest fig in Britain: from an acid mixture in its flavor, it is exceedingly delicious.

5. *Celestial*.—This may be the "Malta" of Downing. Under whatever name, though small, it is one of the very best figs grown in this country.

For forcing under glass, the best are the Allicant and Marseilles. With care, the first three of the above list may be raised in the Middle states, without removal in winter. Any variety may be protected by bending and tying down the branches, and covering with four inches of soil. Below Philadelphia, a little straw will be a sufficient protection.

Dried figs are an important article of import into this country; yet they might be raised as plentifully and profitably in the Southern states. Prune only to keep the tree low and regular. The fig-tree is a great and regular bearer, only when the wood makes too strong a growth, as it is somewhat apt to do. The remedy is *root-pruning*. Cut off, on the first of November, the roots to half the length of the branches from the tree, and occasionally shorten the branches a little, and the fruit will be abundant, and not fall off. The ripening of the fruit may be hastened and perfected by putting a drop of oil in the blossom-end of each fig. This is done by dipping the end of a straw in oil, and then putting it into the end of the fruit. This is extensively practised in France. Compost, containing a pretty liberal proportion of lime, is the best manure for the fig.

FISH.

The cultivation of fish is attracting much attention in this country and in Europe. The study and experiments of scientific and practical men have established important facts upon this subject. Fish may be successfully cultivated wherever water can be conveniently obtained. The creeks, ponds, and small rivers of our land may be well stocked with fish. Fish may be raised as a source of profit and luxury, with as much ease and certainty, and at a much less expense than fowls. This is so important to the whole people, that it demands the earnest attention of our state authorities, as it has engaged that of the government of France. The species of fish best adapted to artificial culture, in particular climates and in different kinds of water, have been ascertained. A man may know what fish to put in his waters, as well as what crops to put on his land, or what stocks on his farm.

The following brief synopsis of the best methods of cultivation will be sufficient to insure success. The first requisite is suitable water for hatching eggs that have been artificially fecundated, and for the occupancy of fish of different ages, and for different species of fish. Fish of different ages are much inclined to destroy each other for food; and hence, in order to multiply them most rapidly, they should be kept in separate ponds until considerably grown, when they will take care of themselves. A spring sending forth a rivulet of clear water, and not subject to overflow in freshets, is the best location. Clear, cool water is essential to the trout, while some other fish will

do well in warm and even roily water. The rivulet running from the spring should be made to form a succession of ponds, three or four in number. These ponds should be connected with flumes made of plank. If the space they must occupy be small, make the flumes zigzag, to increase their length. Put across those flumes, once in four or five feet, a piece of plank half as high as the sides of the flume, with a notch cut in the centre of the top, that the fish may easily pass over: this will afford a succession of little falls, in which the trout very much delights. These different ponds are for the occupancy of fish of different ages, one age only inhabiting one pond. The flumes should have four inches of fine and coarse gravel in the bottom, making the most perfect spawning-ground. Although you would not wish the female-trout to deposite her eggs in the natural way, but will extrude them by the hand (as hereinafter directed), yet they must have these natural conveniences, or they will not incline to spawn at all. At the upper end of each of these flumes separating the ponds, there should be a gate of wire-cloth, to prevent the passage of the fish from one pond to the other; also one at the outlet of the lower pond, to prevent egress of the fish. These must all be so arranged that freshets will not connect them all together. When trout are about to spawn in their natural waters, they select a gravelly margin, and remove, from a circle of about one foot or two feet in diameter, all the sediment, leaving only clean gravel, among which they deposite their eggs, where they are hatched. They want running water of three or four inches in depth for this purpose. A male and female occupy each nest. If left to themselves, they will gradually increase; but so many of their eggs fail of being fecundated, and so many are destroyed before they hatch, by enemies, and by the collection of sediment in the nest, that the number of young fish is small compared with the whole number of eggs deposite. Artificial spawning, fecundation, and hatching, are far more productive. The process is simple and easy: when the female-fish first begins to deposite her eggs, catch her with a small net. It can not be done with bait, for fish will bite nothing at the time of spawning. We recollect, often when a boy, of trying to catch trout out of the brooks in October, where we could see large, beautiful fish, lying lazily in the places from which we had caught many in the summer, and put our bait carefully on every side of them, and they would not bite. Then we knew not the cause: since studying the habits of fish, we have learned that they never will bite while spawning; with trout, this is done from the 1st to the 15th of October, some few spawning till the last of November. Having caught two fish, male and female, take the female in one

hand, and press her abdomen gently with the other hand, gradually moving it downward, and the eggs will be easily extruded, and should fall into an earthen vessel of pure water. Then take the male-fish, and go through the same process, which will press out the spermatic fluid, which should be allowed to fall into the same vessel with the eggs; stir up the whole together, and, after it has stood fifteen minutes, pour off the water, put in more and stir it up, and let it stand as before. This having been done three times, the eggs will be thoroughly fecundated, and are ready to be deposited in the nests for hatching. If the fish are caught before the time of beginning to spawn, the eggs and the spermatic fluid will not be mature, and will be only extruded by hard pressing, and failing to be fecundated, the eggs will perish. The fluid from one male will fecundate the eggs of half a dozen females. These eggs may be hatched in the flumes described above, though hatching-boxes are preferable. The old fish can be returned to the water, and may live many years and produce thousands of fish. These fish, carefully treated and fed, will become so tame as to eat out of your hand, like the "Naiad Queen" of Professors Ackley and Garlick, of Cleveland, Ohio. Among all the hatching apparatus we have seen described, we regard that of the above professors at Cleveland the best. To these gentlemen the country is much indebted for the knowledge derived from their zeal and success in fish culture. At the head of a spring they built a house eight by twelve feet; in the end of the house toward the spring they made a tank four feet wide, eight feet long, and two feet deep; this was made of plank. Water enters the tank through a hole near the top, and escapes through a similar one at the other end, and is received into a series of ten successive boxes, each one a little lower than the preceding one. These boxes were eighteen inches long, eight inches wide, and six inches deep. These were filled to the depth of two inches with clean sand and gravel. The impregnated eggs were scattered among the gravel, care being exercised not to have them in piles or masses. Clean water is necessary, as the sediment deposited by impure water is very destructive to the eggs. If it be seen to be collecting, it should be removed by agitating the water with a goose-quill or soft brush, and allowing it to run off; continue this till it runs clear. But there is a method of preventing impurities in spring-water, that will be always effectual: just around on the upper side of the spring make a tight fence two feet high, and it will turn aside, and cause to run around the spring, all the water that may flow down the rise above in time of rains. The house being near the head, there will not water enough get into the spring, in any

storm, to roil the water. On the side of the boxes where the water escapes should be wire-cloth, so fine as not to allow the eggs to pass through. Such an apparatus will be perfect. This great care is only necessary for trout. All other fish worthy of cultivation, will only need spawning-beds on the margin of their pond. A convenient hatching apparatus is a number of wicker-baskets, fine enough not to allow the eggs to pass through, set in a flume of clear running water.

The method of Gehen and Remy, the great fish-cultivators of France, whose efforts and discoveries have contributed more to this science than those of any, if not of all other men, was to place the eggs in zinc-boxes of about one foot in diameter, having a lid over them—the top and sides of the boxes pierced with small holes, smooth on the inside; these boxes were partly filled with clean sand and gravel, and set in clear running water. M. Costa's method, at the college of France, is to arrange boxes in the form of steps, the top one being supplied with water by a fountain, and that passing from one to the other through all the series, and the eggs placed on willow-hurdles instead of gravel.

Another very simple method may be arranged in the house. It is a reservoir—a barrel or cask—set perhaps two and a half feet from the floor, and a little hatching trough a few inches lower, into which water gradually runs through a faucet, from the reservoir. This water running through the hatching-box, escapes into a tub a little below. Whatever plan be adopted, great care is necessary in preventing sediment from depositing. Cleanliness is a principal condition of success. The eggs of the trout thus fecundated and deposited in October or November will hatch in the spring. Young trout need no feeding for a month after leaving the egg. There is a small bladder or vesicle under the fore part of the body, when they first come out, from which they derive their sustenance. After this disappears, or at the end of about a month, they should be fed, in very small quantities. Too much will leave a portion to decay on the bottom and injure the water. The best possible food (except the angle-worm) is lean flesh of animals, boiled and hashed fine for the young fish. The flesh of other kinds of fish, when they are plenty and not very valuable, would be very good. These young fish should be kept in the first pond until a year old. Then let them into the second pond, closing the gate after them, to make room for another brood in the first pond. The next year let them into the third, and those into the second that are now in the first, and

so on till the fourth. In the last pond, those of different ages will all be large enough to take care of themselves. But sometimes a trout two years old is said to swallow one a year old. But when they get to be three or four years old, this sort of cannibalism ceases. These principles can be carried out in small streams, by constructing gates to keep sections separate, and by forming banks and waste ways for water, with wire gates so high, that the water will not overflow in freshets, and carry the fish away. In taking trout use angle-worms or the fly. A fine light-colored small line is best. They are very shy. The following is a list of other fish, beside the trout, that are well worthy of cultivation:—

Black Bass.—When full grown, this fish is from twelve to eighteen inches in length. One of the better fish for the table, and profitable to raise in a pond covering not less than half an acre. Chub, being a very prolific little fish, may be kept in the same pond as food for the black bass and other large fish. They are very fond of them. Minnows are the best bait for these fish, though they will bite a trolling hook of any ordinary kind. You may raise them as given for the trout above, or allow them to deposit their eggs in spawn beds of their own selection in their pond. They will do well in water less pure than is demanded for the trout.

White Bass.—Not so large as the black bass. Seldom weighs more than two pounds. One of the best for food. Thrives well in small ponds. Requires the same treatment as the preceding. Spawns in May and hatches soon. Easily caught, as he is a great biter, at almost any bait.

Grass Bass or Roach.—One of the most beautiful of the bass kind, and as a panfish highly esteemed. It prefers sluggish water, and hence is well adapted to small artificial ponds. Spawns in May. May be treated as the preceding. Bites the angle-worm well, and several other kinds of bait.

Rock Bass.—A small fish seldom reaching a pound in weight, but is fine and very easily raised in small ponds of any kind of water. Spawns in May and may be treated in all respects as the rest of the bass family, only it will flourish well in quite small ponds.

Pickrel.—Is one of the best of fish, weighs from three to fifteen pounds. Suitable only for large ponds. Spawns early in the spring in the marshy edges of sluggish water. The eggs may be procured and treated as the trout, only

cold running water is not necessary. Best caught by trolling. It is not a good fish to raise with others, as it is apt to eat them up.

Yellow Perch.—Is everywhere well known as a beautiful little fresh-water fish, and good for the table, at all seasons when the water is cool. Perfectly hardy and adapted to sluggish waters, it is one of the best for artificial ponds. Treat like all the preceding; or allowed to take its own course in the pond, it will increase rapidly.

Sun-Fish.—Rarely weighs more than half a pound, but is a good pan-fish. This and the grass bass and yellow perch may be put together in the same pond.

Eels.—May be cultivated with great success in almost any water. But we are so prejudiced against them, never consenting to taste one, that we can not speak in their favor. Of the methods of introducing fish into our rivers and creeks, from which they have nearly all been taken by the fishermen, it is not our design to treat. That subject may be found fully presented in treatises on fish culture, and should command the immediate attention of the authorities in all the states.

We have here given all that is necessary to success among the masses all over the land. There is hardly a township in the United States or British provinces, where good fish-ponds might not be constructed so as to be a source of profit and luxury to the inhabitants.

Fish are so certainly and easily raised, that the practice of cultivating them should be universally adopted.

Transporting fish alive is somewhat hazardous, especially if they be of considerable size. The difficulty is greatly lessened by keeping ice in the water with the fish. Change water twice a day and keep ice in it, and you may safely transport fish around the globe. Eggs of fish are best transported in boxes six inches square, filled with alternate layers of sand and eggs scattered over. When full, make quite wet, and fasten on the cover. Other methods are adopted which will be easily learned of those engaged in the trade.

FLAX.

Change the seed every season. This will greatly increase the quantity, and improve the quality. In nothing else is it more important. In Ireland, the great flax-growing country of the world, they always sow foreign seed when it can be procured. American seed is preferred, and brings the highest price. Experiments with different seeds, on varieties of soils, are much needed. Changing from all the soils and latitudes of our country would be useful. The general rule, however, as with all seeds, is to change from colder to warmer regions.

Soils.—The best are strong alluvial soils. Any soil good for a garden is good for flax. As much clay as will allow soil soon to become dry and easily to be made mellow, is desirable; black loam, with hard, poor clay-subsoil, is also good. Mellow, friable soils are not more important to any other crop than to flax. Land must not be worked when too wet. The land should be rich from a previous year's manuring. Salt, lime, ashes, and plaster, are good applications to flax after it has come up. On light soil with bad tillage, when the flax was so poor that the cultivator was about to plow it up, the application of three bushels of plaster, in the morning when the dew was on, produced a larger yield of better flax from an acre than adjoining growers got from two acres of their best land.

FLOWERS.

Floriculture is an employment appropriate to all classes, ages, and conditions. No yard connected with a dwelling is complete without a flower-bed. The cultivation of flowers is eminently promotive of health, refinement of manners, and good taste. Constant familiarity with the most exquisite beauties of nature must refine the feelings and produce gentleness of spirit. Association with flowers should be a part of every child's education. Their cultivation is suitable for children and young ladies in all the walks of life.

House-plants, and bouquets in sick-rooms, are injurious; their influence on the atmosphere of the rooms is unhealthy. But the cultivation of flowers in the garden or yard is in every way beneficial. We earnestly recommend increased attention to flowers by the whole American people. The necessary limits of our article will allow us to do but little more than to call attention to the subject. Those who become interested will seek information from some of

the numerous works devoted exclusively to ornamental flowers.

Flowers should be planted on rather level land, that the rains may not wash off the seeds and fine mould. Choose a southern or eastern exposure whenever practicable. Avoid, as much as possible, planting in the shade.

Soil—Should be a deep, rich mould, neither too wet nor too dry, and should be enriched with a little compost, every year.

Sowing the Seeds is a most important matter in cultivating flowers. Many fail to come up, solely on account of improper planting. The seeds of most flowers are very fine and delicate. Planted in coarse earth, they will not vegetate; planted near the surface in a dry time, they usually perish. It is best to cover all small flower-seeds, by sifting fine mould upon them; and if the weather does not do it, use artificial means to keep the soil suitably moist until the seeds are fairly up. Stir the soil gently often, and keep out all weeds. It is always best to plant the seeds in rows or hills, with small stakes to indicate their location; you can then stir the ground freely without destroying them. Flowers usually need more watering than most other plants. The usual application of water to the leaves by using a sprinkler is injurious; it may be better than no watering at all, but is the worst way to apply water. Make a basin in the soil near the plants, and fill it with water. The selection of suitable varieties for a small flower-garden is quite important. We shall only mention a brief list. Those who would make this more of a study, are recommended to study "*Breck's Book of Flowers*," which is quite as complete for American cultivators as anything we have. The principal divisions are, bulbous flowering roots, flowering shrubs, and flowering herbs—annual, biennial, and perennial—the first blossoming and dying the year they are sown; the second blossoming and dying the second year, without having blossomed the first; the last blossoming, and the top dying down and coming up the next spring, for a series of years.

Bulbous Flowering Roots.—These need considerable sand in their soil. They should be taken up after the foliage is all dead, and if they are hardy, put the soil in good condition, and dry the bulbs and reset them, and let them remain through the winter. They may need slight protection, by spreading coarse straw, manure, or forest-leaves over them late in the fall; but all the more tender bulbs do better kept in sand until early spring. The best list with which

we are acquainted, for a small garden, is the following: the well-known lilies, the tulips, gladiolas, hyacinths, *Feraria tigrida*, crocus, narcissus, and jonquils.

Flowering Shrubs.—The following is a select small list: Roses, as large a variety as you please, out of the hundreds known; flowering almond, Indigo shrub, wahoo or fire-shrub, the mountain-ash, althea, snowball, lilac, fringe-tree, snow-drop, double-flowering peach, Siberian crab, the smoke-tree, or French tree, or Venitian sumach, honeysuckle, double-flowering cherry.

The list of beautiful herbaceous flowers is very lengthy. We give only a few of those most easily raised, and most showy; the list is designed only to aid the inquiries of those who are unacquainted with them: superb amaranth, tri-colored amaranth, China and German astors—the latter are very beautiful—Canterbury bell, carnation pinks (great variety), chrysanthemum (many varieties and splendid until very late in autumn), morning glory or convolvulus, japonicas, Cupid's car, dahlias, dwarf bush, morning bride or fading beauty, fox-glove, golden coreopsis (we have raised a variety that proved biennial, which was superb all the season), ice-plant, larkspur, passion-flower, peony, sweet pea, pinks, sweet-williams, annual China pink, polyanthus (a great beauty), hyacinth bean, scarlet-runner bean, poppy, portulacca, nasturtium, marigolds (especially the large double French, and the velvet variegated), martineau, cypress vine.

FOWLS.

We are glad to believe that *the hen mania*, that has prevailed so extensively during the last fifteen or twenty years, has considerably abated. After all the extravagant notions about the profits of hens shall have passed away, the truth will be seen to be about the following: Every farmer who has considerable waste grain about, and plenty more to supply the deficiency when the fowls shall have gathered up all the scatterings, had better keep a hundred hens. If he has sand and gravel, and wheat-bran and lime for shells, within their reach, and plenty of fresh water, they will do well, without much further care, in mild weather. In cold weather in winter, keep not more than forty hens together, in a tight, warm place, well ventilated; give them their usual food, with burnt bones pounded fine and mixed with mush, given

warm, with occasionally a little animal food and boiled vegetables, and they will lay more than in summer. They will lay all winter without being inclined to set. Every family, who will treat them as above, may profitably keep one or two dozen through the winter. Most persons who undertake, with a few acres of land, to keep fowls as a business, will lose by it. A few only of the most experienced and careful can make money by it. It may be cheapest for some persons to raise a few chickens for their own use, although they cost them more than the market-price, though it would not be best to raise chickens in that way to sell. "But some one raised the chickens in market for the market-price, and why not I?" Because, they raised a few that got fat on waste grain, and you must buy grain for yours, and give more for it than you can get for your chickens. Whoever would make money by raising fowls on a large scale, must first serve some kind of an apprenticeship at it, as in all other business. Get this experience, and learn by experiment the cheapest and most profitable food, and keep from five hundred to a thousand fowls, and a reasonable though not large profit may be realized. For store-fowls, boiled vegetables and beets cut very fine, with a little meal mixed in, are a good and cheap feed. When keeping fowls out-door in warm weather, keep no more than fifty together, and them on not less than one fourth of an acre of land. The expensive hen-houses and artificial nests are mostly humbugs. Have many places of concealment about, where they can make their nests as they please. When a hen begins to set, remove her, nest and all, to a yard to which layers have no access, and you need have no difficulty with her. Set a hen near the ground, in a dry place, on fifteen fresh eggs, all put under her at once, and they will hatch about the same time at the end of twenty days. Old hens, of the common kind, are best to set. Let them have their own way in everything but running in the wet with their young chickens—and that they will not be much inclined to do if they are well fed. Much is said about the diseases of fowls and their remedies. We have very little confidence in any of it. Sick chickens will die *unless they get well*. Time spent in doctoring them does not generally pay. Wormwood and tansy, growing, or gathered and scattered, or steeped and sprinkled about the premises occupied by hens, will protect them from small vermin. Never give them anything salt or sour, unless it be sour milk. The eggs of ducks, turkeys, or geese, may be hatched under hens. Time, thirty days. Hence, if put under with hens' eggs, they must be set ten days earlier, that they may all hatch at once. Fattening chickens may be well done in six days, by feeding rice, boiled rather soft in sweet

skimmed milk, fed plentifully three times a day. Feed these in pans, well cleaned before each meal, and give only what they will eat up at once, and desire a very little more. Put a little pounded charcoal within their reach, and a little rice-water, milk, or clear water. This makes the most beautiful meal at a low price. Never feed a chicken for sixteen or twenty-four hours before killing it.

Varieties or Breeds.—This has been matter of much speculation. The result has been (what was probably a main object) the sale of many fowls and eggs at exorbitant prices. When chickens have sold at fifty dollars per pair, and eggs at six dollars a dozen, some persons must have made money, while others lost it. Yet, there is some choice in the breed of hens. The kind makes less difference, as far as flesh is concerned, than is usually imagined. It requires about a given quantity of grain to make a certain amount of flesh. Large fowls give us much larger weight of flesh than small ones, but they also eat a much larger quantity of grain. Large fowls are certainly large eaters. The three best layers are the black Polands, the Malayas, and the Shanghaes. Half-bloods, by crossing with the common fowl, are better for this country than either of the above, pure. Fowls are generally improved by frequent crossing. The best we have ever had, for their flesh, we produced by putting a black Poland rooster with common hens; they grew larger than either, and their flesh was very fine. Shanghaes and half-blood Shanghaes have proved permanently the best layers we have ever had. Early pullets make great fall and winter layers, and late chickens are great layers in the spring, when older ones wish to set.

Ducks we have considered in a separate article. We shall do the same with turkeys. Killing, dressing, and preparing all fowls for market, will be treated under the head of "Poultry." Geese will also be considered in another place. We should give drawings of aviaries, but we consider these generally worse than useless, as they are usually constructed. An airy place for summer, and a warm room for winter, poles with *rough bark* on for roosts, and plenty of feed and water, sand, gravel, and lime, will give abundant success.

FRUIT.

The value of fruit is not fully appreciated in this country. As an article of diet

nothing is more natural and healthy. The Creator gave this to man for food, when human nature, physically, was in its normal condition. And why meats have since been allowed, I know not, unless it be the reason why Moses allowed divorce in certain cases, although it was not so in the beginning, viz., the hardness of their hearts. Why the stomach, upon the healthy condition of which all physical, mental, and moral functions so materially depend, should be made the receptacle of dead animals, and especially those so long dead, as much of the meat offered in market, it would puzzle a philosopher to tell.

But we will not write an elaborate article on the healthfulness of a diet composed mainly of milk, fruits, and vegetables. Suffice it to say that experience and observation, as well as analysis and physiology, unite in demonstrating that ripe fruits contain virtues, that go far toward preventing the ordinary diseases of men. They are good, plain or cooked, and for sick or well persons, except in extreme cases. They regulate the bowels and control the secretions, better than any other article of food. They are so highly nutritious, that they sustain nature under arduous toil, better than either meat, fine bread, or the Irish potato. With proper care the fruits are cheaper than any other article of food. They can be raised cheaper than corn or potatoes. They may be enjoyed all the year, are profitable for market, and for food for animals.

FRUITFULNESS.

Inducing it in Fruit-Trees.—Fruit-trees often grow luxuriantly, but bear no fruit, or very little. In nearly all cases the evil may be remedied. One remedy is shortening in. This is done by cutting off half the present year's growth in July. This checks the tendency of the sap to promote so large a growth, and forces it to mature blossom-buds for the next season. Another effectual means is to bend down all the principal branches and tie them down. This has a great influence in checking excessive growth and forming fruit-buds. Frequent transplanting has a tendency also to induce fruitfulness. Root pruning is one of *the best means* of securing this object. Lay bare the upper roots and cut off all the larger ones two feet from the tree. This will check excessive formation of wood and foliage, render the wood firm, and the organic matter of the sap will form abundance of fruit-buds. These methods will produce fruit in abundance on nineteen twentieths of barren or poor-

bearing fruit-trees.

GARDEN.

The garden has been the most delightful abode of man ever since his creation, before and since the fall. One of the most pleasant pastimes, for ladies and children, is gardening. The flower, vegetable, and fruit departments are all pleasant and healthful.

Situation of a garden is important. This varies with climates. In a cold country the warmest exposures are best, and in a hot climate select the coolest. A garden combining both is the best possible. The warmest exposure is good for early vegetables, and the cooler and more shady for the main crop. Much can be done to regulate this by fences and buildings. They will be warm and early on one side, and cool and late on the other.

Soil.—A rich loam is always best. To convert stiff clay, or light sand and gravel, into a good loam, is an easy matter on so small a plat as is usually devoted to a garden. Draw an abundance of sand on clay-ground, plow deep and mix well, and one winter's frost will so pulverize the whole that it will be in excellent condition. In warm climates, the incorporation of the sand with the clay is effected by frequent plowing and rains. On sand and gravel draw plenty of clay and loam, if it can be easily procured; thus it is easy to form a good friable, retentive loam, adapted to every variety of soil-culture. Decayed wood and forest-leaves are excellent for garden-soils. Manure well; but remember that it is possible to overfeed the soil of a garden, so as to render it unproductive. Deep plowing or spading is very important; it is the best possible remedy for excessive drought or unusual rains. The water will not stand on the surface when it first falls, and will be retained long in the soil for the use of the plants. The soil should be very mellow. Plowing or spading too early, in hope of getting earlier vegetables, is often a failure. The earlier the better, if you can pulverize the soil; otherwise not. Plowing when covered with a heavy dew, or when it rains gently, is equal to a good coat of manure. A garden should be on level land well drained; if much inclined, rains will wash off the best of the soil, and destroy many seeds and plants. No weeds should be allowed to grow to any considerable size in a garden. Early and frequent hoeings are important to success. Directions for the cultivation of

each garden vegetable and fruit are given under each of those articles respectively. Methods of gardening at the South and the North vary but little in the main articles. At the North we have to guard against too much cool weather, and at the South against too much heat. Some vegetables that need planting on ridges in the North, to obtain more sun and heat, should be planted on level land at the South, to guard against too much heat and drought. Besides this, the main difference is in the time of planting, which varies more or less with every degree of latitude, or every five hundred feet of elevation. Have no fruit-trees in your vegetable or fruit garden, unless it may be a few dwarf-pears on the quince-stock, and these had better be by themselves.

The plan of a garden is a matter of taste, and depends much upon its size and necessary situation. We prefer ornamental shrubs in front of the house, the flowers adjoining it and passing the windows of those rooms that are constantly occupied, and the fruit-department in the rear of the flowers, while the vegetable-garden should be at the right or left of the fruit, and in the rear of the kitchen. On the other side of the house should be the larger fruit-trees, extending back as far as the fruit and vegetable garden, and in the rear of it, the carriage-house and other out-buildings. The best fence is of good wrought iron, sharp and strong enough to exclude all intruders. When this can not be afforded, a good hedge, made of the plants best adapted to hedges in your latitude, is preferred; next to this a good tight board-fence.

All fruit-gardens should have alleys, eight or ten feet wide, within four rods of each other, to afford space for carting on manures, &c. A vegetable-garden of one acre should have such an alley through the centre each way, with a place in the end, opposite the entrance, to turn around a summer-house, arbor, or tool-house. One rod from the fence, on all sides, should be an alley four or five feet wide; other small alleys as convenience or taste may require. The usual way is to sink the alleys three or four inches below the level of the beds, and cover with gravel, tanbark, shells, &c. We strongly recommend raising the alleys in their middle, at least four inches above the surface of the beds. The paths are always neater, and the moisture is retained for the use of the plants. Excessive rains can be allowed to pass off. This making alleys low sluice-ways for water is a great mistake in yards and gardens.

GARLIC.

This is a hardy perennial plant, from the south of Europe, and has been in cultivation, as a garden vegetable, for hundreds of years. It is cultivated as the onion, and needs much ashes, bonedust, and lime, in the soil. It is much esteemed in some countries, in soups. It is but little used in the United States: it is used at the South as a medicinal herb. We know of no important use of garlic for which onions will not answer as well, and therefore do not recommend garlic as an American garden vegetable. Those who wish to cultivate it will pursue the same course as in raising onions from sets. This will always be successful.

GATHERING FRUITS.

This is almost as important as proper cultivation. This is especially true of the pear. Many cultivators raise inferior pears from trees of the very best varieties, for want of a correct knowledge of the best methods of gathering, preserving, and ripening the fruit. Complete directions will be found under each fruit.

GEESE.

Farmers usually are opposed to keeping geese, believing them to destroy more than they are worth. If you have a suitable place to keep them, they may be profitable. They should have a pasture with a fence they can not pass, enclosing a spring, pond, or stream. They do better to have a little grain the year round. This, with plenty of grass in summer and cut roots in winter, will keep them in fine condition. The feathers will pay the cost of keeping, leaving the increase and feathers of the young as profit. On an acre or two, one hundred geese may be kept, and if the proportion of males and females be right, they will yield a profit of two dollars each.

GOOSEBERRY.

This is a native of the north of Europe and Asia, from which all our fine varieties have been produced by cultivation. Our own native varieties are not known to have produced any very desirable ones. Probably the zeal of the Lancashire weavers, in England, will surpass all that Americans will do for

the next century in gooseberry culture. They publish a small book annually, giving an account of new varieties. The last catalogue of the London Horticultural Society mentions one hundred and forty-nine varieties, as worthy of cultivation. A few only should receive attention among us. Gooseberries delight in cool and rather moist situations. They do not flourish so naturally south of Philadelphia; though they grow well in all the mountainous regions, and may produce fair fruit in many cool, moist situations. Deep mulching is very beneficial; it preserves the moisture, and protects from excessive heat. The land must be trenched and manured deep. In November, cut out one half of the top, both old and new wood, and a good crop of fine fruit may be expected each year, for five or six years, when new bushes should take the place of old ones. Propagate by cuttings of the last growth. Cut out all the eyes, below the surface, when planted. Plant six inches deep in loam, in the shade. Press the soil close around them. To prevent mildew, it is recommended to sprinkle lime or flour of sulphur over the foliage and flowers, or young fruit. The fruit-books recommend the best varieties, and very open tops, as not exposed to mildew. We recommend spreading dry straw, or fine charcoal, on the surface under the bushes, as a perfect remedy, if the top be not left too thick. There is no necessity for mildew on gooseberries. The fall is much the best season for trimming, though early spring will do. Varieties are divided into red, green, white, and yellow. These are subdivided into hundreds of others, with names entirely arbitrary. The following are the best varieties, generally cultivated in this country:—

1. *Houghton's Seedling*.—Flavor, superior; skin, thin and tender; color, reddish-brown. Prodigious grower and bearer—none better known. Free from mildew. Native of Massachusetts.
2. *Red Warrington*.—Later and larger than the preceding; hangs long on the bush without cracking, and improves in flavor.
3. *Woodward's Whitesmith*—is one of the best of the white varieties.
4. *Cleworth's White Lion*.—Large and late; excellent.
5. *Collier's Jolly Angler*—is a good green gooseberry; fruit large, excellent, and late.

6. *Early Green Hairy*.—Very early; rather small; prolific.

7. *Buerdsill's Duckwing*—is a good, late, yellow gooseberry; large fruit, and a fine-growing bush.

8. *Prophets Rockwood*.—Very large fruit of excellent quality, ripening quite early.

The foregoing list, giving two of each of the four colors, and early and late, are all, we think, that need be cultivated. Many more varieties, nearly equalling the above, may be selected; but we are not aware that any improvement would be made. Downing gives the following list for a garden: —

Red.—Red Warrington, Companion, Crown Bob, London, Houghton's Seedling.

Yellow.—Leader, Yellow Ball, Catharine, Gunner.

White.—Woodward's Whitesmith, Freedom, Taylor's Bright Venus, Tally Ho, Sheba Queen.

Green.—Pitmaston Green Gage, Thumper, Jolly Angler, Massey's Heart of oak, Parkinson's Laurel.

Thus you have Downing's authority; his list includes most of those we have recommended above. The varieties are less important than in most fruits, provided only you get the large varieties of English gooseberry. Proper cultivation will insure success. Whoever cultivates, only tolerably well, the Houghton Seedling, will be sure to raise good berries, free from mildew.

GRAFTING.

This is one of the leading methods of obtaining such fruits as we wish, on stocks of such habits of growth and degrees of hardiness, as we may desire. The stock will control, in some degree, the growth of the scion, but leave the fruit mainly to its habits on its original tree. The advantages of grafting are principally the following:—

Good varieties may be propagated very rapidly. A single tree may produce a

thousand annually, for a series of years. Large trees of worthless fruit may be changed into any variety we please, and in a very short time bear abundantly. Fruits not easily multiplied in any other way, can be rapidly increased by grafting. Early bearing of seedlings can be secured by grafting on bearing trees.

Tender and exotic varieties may be acclimated by grafting into indigenous stocks. Fruit can be raised on an uncongenial soil, by grafting into stocks adapted to that soil. Several varieties may be produced on the same tree, for ornament or economy of room. Dwarfs of any variety may be produced by grafting on dwarf stocks, and we may thus grow many trees on a small space. A slow-growing variety may be made to form a large top, by grafting into large vigorous-growing stocks. We are enabled to carry varieties to any part of the world, at a cheap rate, as the scions, properly done up, may safely be carried around the globe.

Time of Grafting.—Grafts may be made to live, put in in any month of the year, but the beginning of the opening of the buds in spring, is the preferable season. Stone fruits should be budded; and all fruits may be made to do well budded. Budding is usually only practised on small trees, while grafting may be performed on trees of any size.

Cutting and preserving Scions.—Mature shoots of the previous year's growth are best. Those of the year before will also do. They may be cut at any time from November to time of setting. Perhaps the month of February is best. They may be well preserved in moist sawdust in tight boxes. The more there are together the better they will keep. They keep better by being cut a little below the beginning of the last year's growth, but it is more injurious to the tree. They may be kept well in fine sand, moist and cool. Too much moisture is always injurious. Put the lower ends in shallow water, and they will look very fine, but not one of them will live. Scions cut in the fall and buried six inches deep in yellow loam or fine sand, will keep well till next spring. There are several methods of grafting only two of which deserve particular attention. These are cleft-grafting and tongue or splice grafting, see figures.

Cleft-Grafting is performed in most cases, when scions are grafted upon stocks much larger than themselves. It is too well known to need particular description. Tools should be sharp, and it should be performed before the



Cleft-Grafting.

bark slips so easily as to be started by splitting the stock. It endangers the growth of the scions. The requisite to success in all grafting, is to have some point of actual contact, between the inside barks of both the scion and the stock.

This is more



Tongue-Grafting.

certainly secured by causing the scion to stand at a slight angle with the stock.

Tongue-Grafting is generally used in grafting on small stocks—seedlings or roots. With a sharp knife, cut off the scion slanting down, and the stock slanting up, split each in the centre, and push one in to the other until the barks meet, and wind with thick paper or thin muslin, with grafting wax on one side. This is generally used in root-grafting. The question of root-grafting has excited considerable discussion recently. Many suppose it to produce unhealthy trees, and that retaining the variety is less certain than by other modes. Root-grafting is a cheap and rapid means of multiplying trees, and hence is greatly prized by nursery men. Practical cultivators of Illinois have assured us, that it is impossible to produce good Rhode Island greenings in that state, by root-grafting—that they will not produce the same variety. We see no principle upon which they should fail, but will not undertake to settle this important question. For ourselves we prefer to use one whole stock for each tree, cutting it off at the ground and grafting there.

Grafting Composition or Wax.—One part beef's tallow, two parts beeswax,

and four parts rosin, make the best. Harder or softer, it is liable to be injured by the weather. Warm weather will melt it, and cold will crack it. Melt these together and pour them into cold water, and pull and work as shoemaker's wax. When using, it is to be kept in cool or warm water, as the weather may demand. In its application, it is to be pressed closely over all the wound made by sawing and splitting the limb, and close around the scions, so as to exclude air and water. Clay is often used for grafting, but is not equal to wax. You can use grafting tools, invented especially for the purpose, or a common saw, mallet, knife, and wedge.

GRAPES.

Those cultivated so extensively in Europe were natives of Persia—showing that they may be acclimated far from their native home. Foreign grapes are not suitable for out-door culture in this country, except a very few varieties, which do well in the Southern states. The native grapes of this country have produced some excellent varieties, which are now in general cultivation. Others are beginning to attract notice, and seedlings will probably multiply rapidly, and great improvements in our native grapes may be expected. The subject of grape-culture deserves greatly-increased attention. To all palates the grape is delicious; it is not only one of the most palatable articles of diet, but is more highly medicinal than any other fruit. It is the natural source of pure wine. Pure wine made of grapes is only to be procured, in this country, by domestic manufacture. Probably not one out of a thousand gallons of imported wines, sold as pure, contains a drop of the juice of the grape;—they are manufactured of poisonous drugs and ardent spirits—generally common whiskey. A French chemist discovered a method of imitating fermented liquor without fermentation, and distilled spirits without distillation. His process has been published in this country in book form, and by subscription; and while those books are unknown in the bookstores, they are generally possessed by prominent liquor dealers;—and the practice of those secret arts is terribly dangerous to the community. Antecedent to this chemical manufacture of poisonous liquors, such a disease as *delirium tremens* was unknown. Thus the Frenchman's discovery filled the liquor-sellers' pockets with cash, and the land with mourning, over frequent deaths by a disease, the horror of which is equalled only by hydrophobia. In self-defence, all should give up the use of everything purporting to be imported wines or liquors.

Wine should not be used as a common beverage by the healthy. The best medical authority in the world has pronounced it absolutely injurious. But in many cases of sickness, especially in convalescence from fevers, it is one of the very best articles that can be used; hence, a pure article, of domestic manufacture, should be accessible to all the sick. (See our article on "Wine.") The luxury of good grapes can be enjoyed by every family in the land who have a yard twenty feet square. In the cities, almost every house may have a grapevine or two where nothing else would grow. Allow a vine to run up trellis-work in the rear of the house, and over the roof of a wing, or rear-part, raised two feet above the roof, supported by a rack. In such situations they will bear better than elsewhere, will be out of the way, and decidedly ornamental. In such small yards, from five to twenty-five bushels have often grown in a season. Some climates and soils are much better suited to grape-culture than others. But we have varieties that will flourish wherever Indian corn will mature.

Location.—For vineyards, the sides of hills are usually chosen, sometimes for the purpose of a warm exposure, but generally to secure the most perfect drainage. A northern exposure is preferable for all varieties adapted to the climate. To mature late varieties, choose a southern or eastern exposure.

Soil.—Gravelly, with a little sand, on a dry subsoil, is preferable, though good grapes may be grown upon any land upon which water will not stand. Grapes always need much lime. If the vineyard is not located on calcareous soil, lime must be liberally supplied, especially for wine-making. A dry subsoil, or thorough draining, is indispensable to successful grape-culture. We prefer level land, wherever thorough draining is practicable.

Propagation.—Choice grapes are propagated by grafts, layers, or cuttings. New ones are produced from seeds. The more kinds that are cultivated together, the greater will be the varieties raised from their seeds, by cross-fertilization in the blossoms. A small grape crossed with a large one, or an early with a late one, or two of different flavors, will produce mediums between them. Seeds should be cleaned, and planted in the fall, or kept in sand till spring. In the fall, cover up the young vines. The second or third year, the young vines should be set in the places where they are designed to remain. By efforts to get new varieties, we may adapt them to every latitude, from the gulf of Mexico to Pembina.

Layers.—These produce large vines and abundance of fruit earlier than any other method of propagation. Put down old wood in May or early June, and new wood a month later; fasten down with pegs having a hook to hold the vine, and cover up with earth; they will take root freely at the joints, and may be removed in autumn or spring. If you put down wood too late, or do not keep it covered with moist earth, it will fail; otherwise it is always sure.

Cuttings—may be from any wood you have to spare, and should be about a foot long, having two buds. Plant at an angle of forty-five degrees, one bud and two thirds of the cutting under the soil. A little shade and moisture will cause nearly all to grow. A little grafting-wax on the top will aid the growth, by preventing evaporation. The cutting, so buried as to have the top bud half an inch under fine mould, is said to be surer. Cuttings should be made late in fall, or early in winter, and preserved as scions for grafting. Cuttings made in the spring are less sure to grow, and their removal is much more injurious to the vine. Vines raised from cuttings may be transplanted when one or two years old.

Grafting—should be performed after the leaves are well developed in the spring. The sap becomes thick, which aids the process. Remove the earth, and saw off the vine two or three inches below the surface. Graft with scions of the previous year's growth, but well matured, and apply cement, to keep the sap from coming out. Cover all but the top bud. In stocks an inch in diameter put two scions. Very few need fail.

Budding—maybe done as in other cases, but always after the leaves are well developed, to avoid bleeding. These modes of propagation stand in the following order in point of preference, the best being named first: layers, cuttings, grafting, budding.

Culture and Manure.—Land prepared by deep subsoil plowing, highly manured and cultivated the previous season in a root-crop, is the best for a vineyard. The trenches for the rows should be spaded twenty inches deep, and a part of the surface-soil put in the bottom. After planting the vines, stir the ground often and keep clear of weeds. At first, stir the soil deep; but, as the roots extend, avoid working among them, and never disturb the roots with a plow. Mulching preserves the soil in a moist, loose condition, and is a good preventive of mildew. In many instances it is said to have doubled the crop.

Common animal-manures are good for young vines, and in preparing the soil, but are rather too stimulating for bearing vines, often injuring the fruit. Ashes and cinders from the smith's forge, wood-ashes, charcoal, soapsuds, bones and bonedust, lime, and forest and grape leaves and trimmings, carefully dug into the soil around the vines, are all very good. A liberal supply of suitable manures will keep the vines in a healthy condition, and preserve the fruit from disease and decay. This, with judicious pruning, will render the grape-crop regular and sure.

Vineyards—should be in rows five feet apart, with vines four feet apart in the row. Layers of one, and cuttings of two years' growth, will bear the second year, and very plentifully the third year. A good vineyard in the latitude of Cincinnati yields about one hundred and fifty bushels of grapes per acre, making four hundred gallons of wine. The average yield of wine per acre, throughout the country, is estimated at two hundred gallons.

Training under Glass.—By this means the fine foreign varieties may be brought to perfection in our high latitudes. With most of the best kinds, this can be done by solar heat alone. A house covered with glass at an angle of forty-five degrees, facing the south, will answer the purpose. With a slight artificial heat, the finest varieties may be perfected, and others forwarded, so as to have fine grapes at most seasons of the year. The vines are planted on the outside of the grapehouse, and allowed to pass in through an aperture two feet from the ground, and are trained up near the glass on the inside. Protect the roots in winter by a covering of coarse straw manure. Wind the vines on the inside with straw, lay them down on the ground in the grape-house, and keep it closed during the winter. A house one hundred feet long and twenty-five feet wide, filled mainly with Black Hamburg, with a few other choice varieties, would afford a great luxury, and prove a profitable investment. From one such house, near a large city, a careful cultivator may realize a thousand dollars per annum. Native and even hardy varieties are often greatly improved by cultivation under glass, or by a little protection in winter.

The Isabella grape is hardy and productive in western New York. In 1856, we noticed a vine that had been laid down in a dry place and covered slightly with earth, in autumn; the fruit was more abundant, and one fourth larger, than that on a similar vine by its side that had remained on the trellis during winter: this shows the value of protection even to hardy vines.

Training.—There are many methods, and the question of preference depends upon the location of the vines, the space they may occupy, and the taste of the cultivator. There are four principal systems—the cane or renewal system, spur system, fan-training, and spiral or hoop training.

The renewal system we prefer for trellises. Put posts firmly in the ground eight feet apart, allowing them to be seven feet above ground after they are set; put slats of wood or wire across these, a foot apart, commencing a foot above the ground. Set vines eight feet apart; let the vines be composed of two branches, coming out near the ground: these can be formed by cutting off a young vine near the ground, and training two of the shoots that will spring from the bottom. These two vines should be bent down in opposite directions, and tied horizontally to the lower slat of the trellis; cut these off, so as to have them meet similar vines from the next root; upright shoots from these will extend to the top of the trellis, and it is then covered, and the work is complete. After these upright canes have borne, cut off every alternate one, two or three inches from its base, and train up the strongest shoot for a bearer next year: thus cut off and train new alternate ones every year, and the vine will be constantly renewing, and be in the most productive state; keep the vines clipped at the top of the trellis, and the sap will mature strong buds for next year's fruit. We regard this the most effectual of all training. The principle of renewal can be applied to any form of vine, and eminently promotes fruitfulness. Many complain that their vines, though liberally pruned, do not bear well. The difficulty may be that the new wood is principally removed, while the old is left to throw out strong-growing shoots, bearing abundance of foliage and little fruit. More of the old wood removed, and more of the young saved, would have produced less vines and much more fruit.

Pruning—is the most important part of successful grape-culture. Mistakes on this subject are very injurious. Let vines grow in their own way, and you will have much wood and foliage, and very little, poor fruit. Some cut off the shoots in summer just above the fruit, and remove most of the leaves around it to expose the fruit to the sun. This often proves to be a ruinous mistake; the sap ascends to the leaves, and there amalgamates with what they absorb from the atmosphere, and thus forms food for the vine and fruit. It is the leaves, and not the fruit, which need the sun: the leaves are the lungs, upon the action of which the life and health of the fruit depend. Blight of the leaves destroys

the fruit, and a frequent repetition of it destroys the vine. Grape-vines should not be pruned at all until three years old, as it retards the growth of the roots, and thus weakens the vines. Older vines should be freely pruned in November or December; pruned in winter they *may* bleed in the spring, and pruned in the spring they *certainly* will bleed. Tender vines, not protected, may have an excess of wood left in the fall to allow for what may perish in winter; in this case, cut away the dead and surplus wood in spring, but never until the leaves are well developed, so as to prevent bleeding. Necessary summer-pruning is of much importance. Remove no leaves, except the ends of branches, that have already made as much wood as they can mature. In the Middle states this should be done about the last of July, and at the South a month earlier. Weak lateral branches, that bear no fruit, may be removed, but not all of them, for it is on the wood of this year's growth that the fruit will be found the following season. Old wood does not send out wood in spring that will bear fruit the same season; that wood will bear fruit next season if allowed to remain. Whoever observes will notice that grapes grow on young shoots of the same season; but they are shoots from wood of the previous year's growth, and not from old wood. Many suppose if they trim their vines very closely, as the old vines send forth abundance of new wood, and it is new wood on which the fruit grows, of course they will have abundance of grapes; and they are disappointed by a failure. The explanation of the whole is, fruit grows on new wood, from wood of previous year's growth, and not from old vines; hence, in lessening a vine, remove old wood. This is the renewal system, whatever the form of the vine, and is the whole secret of successful pruning. This accounts for the great success of the Germans in producing such quantities of grapes on low vines. In their best vineyards, they do not allow their vines to grow more than six or seven feet high, and yet they produce abundantly for many years. They so prune as to have plenty of last year's wood for the production of fruit the current season; after this has borne fruit, they remove it to make room for the young wood that will produce the next season. This principle is applicable to vines of any shape or size you may choose to form. The removal, in summer, of excessive growth, and shortening the ends of those you design to retain, throws the strength of the vine into the fruit, and to perfect the wood already formed. Liberal fall-pruning is necessary to induce the formation of new wood the next season, for bearing the following year. Parts that grow late do not mature sufficiently to bear fruit the next season; hence, cut off the ends in summer, and let what

remains have the benefit of all the sap.

Reduction of Fruit.—The grape is disposed to excessive bearing, which weakens the vine, and injures the quality of the fruit. Liberal pruning in autumn does much to remedy this evil, by not leaving room for an excessive amount of fruit: hence, when you have a plenty of fruit-bearing wood, cut off the ends, so as to leave spurs with two buds, or at the most only four; when too much fruit sets, remove it very early, before the juices of the vine have been wasted upon it. A vine cut or wounded in spring will bleed profusely. Sheet India-rubber, or two or three thicknesses of a bladder, wet and bound closely around, may prevent the bleeding.

Mildew—is very destructive in confined locations, without a good circulation of air. Sulphur and quicklime, separate or combined, dug into the soil around the vines, is a preventive. Straw or litter of any kind, spread thick under the vines, is, perhaps, the best remedy—the action of it is in every way beneficial.

Insects.—The rosebug, spanworm, great greenworm, and many other insects, infest grapevines, and do much injury. The large worms are most easily destroyed by hand; the small insects by flour-of-sulphur, or by snuff, sprinkled over profusely when the vines are wet. The various applications recommended in this work for the destruction of insects, are useful on the grapevine. The principle is to apply something offensive to the insects, without being injurious to the vines.

Preserving Grapes.—Packed in sawdust or wheat-bran, always thoroughly dried by heat, they will keep well until spring. Another method is packing them in cotton-batting or wadding (the latter is best); or put them in baskets holding no more than four or five quarts, cover tight with cotton, and hang up in a cool, airy place, and they will long remain in good condition. In shallow boxes, six inches deep, put a sheet of wadding, and on it a layer of bunches of grapes, not allowed to touch each other; on the top of the grapes put another sheet of cotton, and then another layer of grapes, and so the third, covering the last with cotton, and put the cover on tight, and keep in a cool place. This is the most successful method.

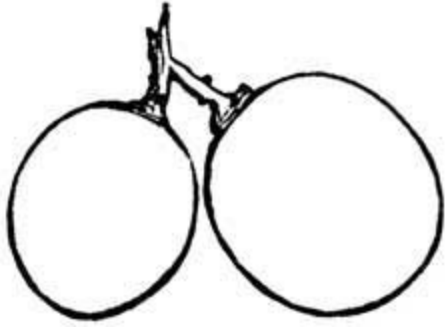
A new method is to suspend hoops by three cords, like a baby-jumper, and hang the bunches of grapes all around it, as near as possible without touching,

on little wire hooks, passing through the lower ends of the clusters, allowing the stem end to be suspended, and the grapes hang away from each other, and if the place be not damp enough to mould them, and not dry enough to cause them to shrivel, they keep exceedingly well. It requires more care and judgment, than the other methods. A very cool situation, without freezing, is essential in all cases. It is also necessary to remove all broken or immature grapes, from the clusters you would preserve.

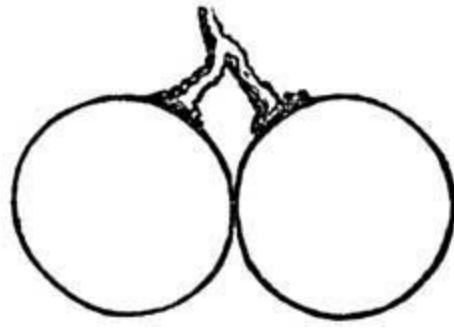
Varieties are very numerous, and their nomenclature is confused, as that of other fruits. It is utterly useless to cultivate foreign grapes in the open air in this country. They succeed very imperfectly, even in the Southern states. But for cultivation under glass, they are preferable to any of our own. The following foreign grapes are preferred in this country:—

Black Prince, White Muscat, White Constantia, White Muscadine, White Sweet-water, Early White Muscat, Black Cluster, Black Hamburg. The latter is the best of all foreign grapes for cultivation under glass. It is very delicious, a great bearer, of very large clusters. It requires only solar heat to bring it to perfection.

Native Grapes.—Of these we now have a large number, many of which are valuable. We call attention only to a very few of the best. The *Isabella* as a table luxury is hardly surpassed. In the Eastern, Middle, and Western states, it is generally hardy and prolific. In northern Maine, New Hampshire, and Vermont, it does not ripen well. The seasons are too short. It also feels somewhat the severity of the weather, on the western prairies. It is also apt to decay at the South. For all other parts it is one of the very best. It is an enormous bearer, one vine having been known to produce more than ten bushels, in a single year.



The Isabella Grape.



The Catawba Grape.

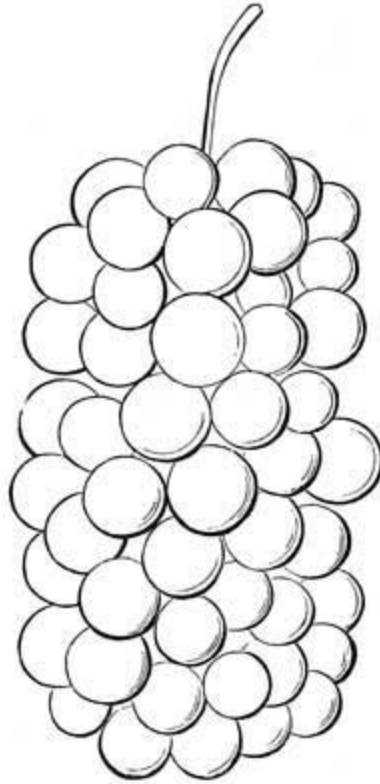
Next is the *Catawba*, better for wine, more vinous but not so sweet as the Isabella, ripens two or three weeks later, and hence not so good in high latitudes.

The Rebecca Grape.—This is a comparatively new variety, of great promise. White like the Sweet-water, flavor very fine, vine hardy and productive.

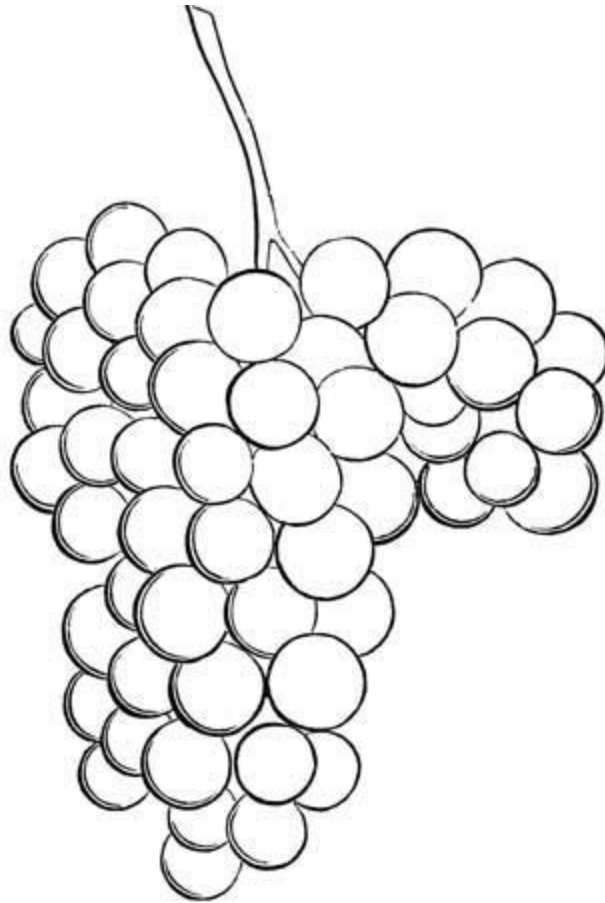
The Diana is a small delicious grape, excellent flavor for the dessert, and ripens two weeks earlier than the Isabella. Hence good for northern latitudes.

The Concord.—Large, showy, of good but not the best flavor, and ripens with the Diana. Should be cultivated at the North.

The York Madeira is similar to the Isabella, smaller and a few days earlier.



The Rebecca Grape.



The Delaware Grape.

The Delaware is a small brown grape, excellent and hardy. Ripens quite as early as the *Isabella*. Best outdoor grape, in many localities.

The Canadian Chief.—One of the very best grapes for Canada.

Canby's August.—Very fine; considered better for the table than the *Isabella*, ripens ten days earlier, and as it is a good bearer, it should be generally cultivated.

The Ohio Grape is a good variety, beginning to attract much notice.

The Scuppernong is the best of all grapes, for general cultivation at the South. It is never affected by the rot. Not easily raised from cuttings. Layers are better. It does best trained on an arbor.

The soil and climate of the South are well adapted to the grape, even the finer varieties that do not flourish well at the North. They are, however, seriously affected by the rot, an evil incident to the heat and humidity of the climate. It

being very warm, the dews and rains incline the fruit to decay. We think the evil may be prevented by two very simple means: Keep the vines very open, that they may dry very soon after rain; and train them to trellises, from six to ten feet high, and over the top put a coping of boards, in the shape of a roof, extending eighteen inches on each side of the trellis. It will prevent the rain and heavy dews from falling on the grapes, and is said to preserve them perfectly. This arrangement is about equal, in a warm climate, to cold graperies at the north. We recommend increased attention to this great luxury, in all parts of the country. Seedlings will arise, adapted to every locality on the continent.

GRASSES.

There is a great number of varieties, adapted to cultivation in some countries and climates, but not suitable for American culture. On the comparative value of different grasses there is a diversity of opinions. The best course for the practical farmer is, having the best and surest, therewith to be content. Sir John Sinclair says there are two hundred and fifteen grasses cultivated in Great Britain. We shall notice a very few of them, with a view to their comparative value:—

1. *Sweet-scented Vernal Grass*.—Small growth; yield of hay light. For pastures it is very early, and grows quickly after being cropped, and is excellent for milch-cows; grows well on almost any soil, but most naturally on high, well-drained meadows. It grows in great abundance in Massachusetts.

2. *Meadow Foxtail*.—Early like the preceding, but more productive and more nutritious. It is one of the five or six kinds usually sown together in English pastures; best for sheep and horses.

3. *Rough Cocksfoot*.—*Orchard-grass* of the United States; cows are fond of it. In England it is taking the place of clovers and rye-grass. About Philadelphia it is supplanting timothy. It is earlier, and therefore better to mix with clover for hay, as they mature at the same time; grows well in the shade, and on both loams and sands; springs rapidly after being cropped. Colonel Powell, one of the best American farmers, says it produces more pasture than any other grass he has seen in this country. Two bushels of seed are sown on

an acre.

4. *Tall Oat-Grass*.—A valuable grass, deserving increased attention. It will produce three crops in a season; grows four or five feet high, and should be cut for hay when in blossom. Of all grasses, it is the earliest and best for green fodder.

5. *Tall Fescue*.—Cut in blossom, it contains more nutriment than any other known grass. Grows well by the sides of ditches, and is well adapted to wet bogs, as, by its rapid growth, it keeps down coarse, noxious grass and weeds.

6. *Rye Grass*.—This is extensively cultivated in Scotland and in the north of England. It is mixed with clover. Respecting its comparative value there is a diversity of opinion. Some do not speak well of it.

7. *Red Clover and White Clover*.—See article "Clover."

8. *Lucern*.—This yields much more green feed at a single crop than any other grass. For soiling cattle it is one of the best, and may be cut twice as often as red clover. This makes a good crop, soon after time for planting corn. Common corn or pop-corn, and later, Stowell's evergreen sweet corn, are the best for soiling cattle; but for early soiling, use lucern, or some other quick-growing, large grass. Lucern needs clean land, or cultivation at first, as young plants are tender. The tap-root runs down very deep; hence, hard clay or wet soils are not favorable. It stands the cold, in latitudes forty to forty-five degrees in this country, better than red clover.

9. *Long-rooted Clover*.—This is a Hungarian variety—biennial, but resows itself several years in succession, on good, clean land. Its yield of hay and seed is abundant. Needs a deep, dry soil, and stands a drought better than any other grass. To plow in as a fertilizer, or for soiling cattle, it is valuable, wherever it will flourish.

10. *Sain-Foin*.—Adapted to calcareous or chalky soils; considered one of the best plants ever introduced into England; but in New England it proves almost a failure—it requires more cool moisture and less frost.

11. *Timothy*.—In England, *Meadow Cats'-tail*, and in New England, *Herd's-grass*. This is the most valuable of all the grasses, and wherever it will thrive well, should never be superseded by anything else for hay. It should be cut

when the seed has begun to harden, but before it begins to shell, and never in the blossom. Let every farmer remember that timothy, cut in the seed, contains twice as much nutriment as when cut in the blossom; hence, it is not worth more than half as much for hay, sown among clover, as when sown by itself, as it must be cut too early, to avoid losing the clover.

12. *Red Top*.—We can not find this described in agricultural books; but we have been familiar with it for thirty-five years, and can not find a New York or New England farmer who does not know it well and prize it highly. For low, moist, rich meadows, the red top is the best for hay of any known grass. It yields abundantly, and may be cut at any time, from July to last of September. The hay is better for cattle than timothy. Many intelligent gentlemen insist that it is the most healthy hay for horses.

After all that has been written on the various grasses, we regard it best for farmers throughout the continent to cultivate only the following:—

For early pastures, *vernal grass* and *meadow foxtail*; pastures through the season, *white clover*, *cocks-foot*, *meadow foxtail*, *red clover*, and *timothy*; for lowland pastures, *red top* and *tall fescue*; for hay, *timothy*, *red top*, *orchard grass*, and *tall fescue*; for the shade of fruit-trees, *orchard grass*; to be plowed in as fertilizers, *red clover* and *white clover*, for soiling cattle, *tall oat-grass* and *lucerne*.

Time of sowing grass-seed is important. Some prefer the fall, and others the spring. Fall sowing should be very early or very late. Early sowing will give the young plants strength to endure the frosts of winter, which would kill late sown; but sow so late that it will not vegetate until spring, and it will come up early and get out of the way of the droughts of summer. Grass-seed sown late in the spring will always fail, except when followed by a very wet season. Sow timothy with fall grain, or late in the fall, or on a light snow toward the close of winter. Do not sow clover in the fall, as the young plants will generally fail in the cold winter;—sow it on the last light snow of winter, and it will always succeed. Roll the land in spring on which you have sown grass-seed in the last of winter; it will benefit the grain, and cause the grass-seed to catch well, and get an earlier and more rapid growth. Let all who would not lose their seed and labor, remember that grass-seed not sown so as to form good roots, before the frosts of winter or the drought of summer, will be lost;

the plants will be killed. Timothy-seed sown in the fall, one peck to the acre, will produce a good crop the next season.

GREENHOUSE.

Greenhouses vary as much in style and cost as dwellings. The simplest is any tight enclosure, covered with a glass roof at an angle of forty-five degrees, facing the south, and kept warm by artificial heat. The temperature is not allowed to be lower than forty nor higher than seventy degrees of Fahrenheit; this will keep plants growing and make them blossom, and affords a good place for starting plants to be transplanted to out-door hotbeds, and finally to the vegetable garden, after frosts are over. There is but one main danger in greenhouse culture, and that is obviated by a little care: it is, allowing the air to become too much heated for the health of the plants; they require but little heat, but need it regularly. Some greenhouses are warmed by stoves, and serve a good purpose; others have a stove set in a flue which is built in the wall, gradually rising until it has passed around two or three sides of the building. Place three or four sheet-iron pans over this flue, at different points, and keep them filled with water; the fire in the flue will heat the water, and impart both warmth and humidity to the atmosphere, which is very favorable to the health and growth of plants. Such a house is favorable to the growth of tender exotic fruits and plants. A similar house without any artificial heat affords an excellent place for the cultivation of the finest varieties of foreign grapes.

GYPSUM, OR PLASTER OF PARIS.

The fertilizing properties of this article were discovered by a German laborer in a quarry, who observed the increased luxuriance of the grass by his path, when the dust fell from his shoes and clothes. This led to experiments which demonstrated its fertilizing power. With the protracted controversies on gypsum we have nothing to do; certain important facts are established which are valuable to agriculturists.

Gypsum is valuable as an application to the soil, at from three fourths to one and a quarter bushels to the acre. On poor land, for a flax crop three bushels per acre, applied after the plants were up, and when wet, produced a great

crop. It should be applied only once in two years, or in very small quantities every year. Applied as a top-dressing, it will do no good until a considerable quantity of rain has fallen upon it. If it be applied in the spring, and the summer prove a dry one, its greatest effect will be felt the next season. Its most marked effects are on poor soils; on land already rich it seems to produce but little effect; on dry, sandy or gravelly soils, it will increase a clover crop from one fourth to two thirds; sowed among clover and immediately plowed in, it acts powerfully. Plants of large leaves feel its influence much more than those with small ones, hence its excellence on clover, potatoes, and vines. Some soils contain enough plaster already: the farmer must determine by analysis or experiment. On the compost heap it is valuable in small quantities; it is also useful on all long, coarse, or fresh manures of the previous winter. Seeds rolled in it before planting vegetate sooner and stronger. Mixed with an equal quantity of ashes and a little lime, and applied to any crop immediately after hoeing, or when just coming up, it adds materially to its growth. It is better to apply it twice—on first coming up, and immediately after first hoeing; small quantities are best;—it will ten times repay the cost and labor. Upland pastures and meadows, except clay soils, are greatly benefited by it. A time-saving method of sowing plaster on fields of grass or grain, is to sow out of a wagon driven slowly through the field, the driver being guided by his former tracks, while two men sow out of the wagon. It is customary to put plaster and ashes, mixed, around the hills of corn, or throw it upon the plants. Sown on the field of hoed or hill crops, its effects are much greater than when only put on the hill. It should be sown equally over the whole ground.

HARROWING.

The very liberal use of the harrow is one of the principal requisites of successful farming. No other single tool does so much to pulverize the soil, as the harrow. A full crop can only be raised on a fine mellow soil. Seeds planted in soil left coarse and uneven, will vegetate unevenly, grow unequally, ripen at different times, and produce unequal quantities. Many farmers insist that it is a mere notion, without reason, to harrow land four or five times, and roll it once or twice. Not one in five hundred believes in the full utility of such a thorough working of the soil. Coarse lumpy soils expose the seeds and roots of young plants to drought, and to too strong action of the

atmosphere. (See article on *Rolling*.)

Harrow sandy and sod land whenever you please. If you work any other soil when very wet, it will not recover from the effects of it during the whole season. Harrow land the first time the same way it was plowed.

The form of a harrow is of no importance, except avoiding the butterfly drag, that seldom works well. The square harrow with thirty teeth is usually preferred. Every farmer should have a **V** drag also.

Corn, potatoes, peas, and other crops that are planted in straight rows, should be harrowed just after coming up, with a **V** drag, drawn by two horses. The front teeth should be taken out that the row may pass between the teeth, as well as between the horses.

Such a cultivation will do more good than any other single subsequent one. It stirs the whole surface, pulverizing the soil, keeps it mellow and moist, and destroys the weeds, and all at the best possible time, for the benefit of the crop. No other form of cultivation is so good for a young crop. Try two acres, one in the usual way, and the other by harrowing, as we recommend, when it first comes up, and you will never after neglect harrowing all your hoed crops.

HAY.

Farmers differ in their modes of making and preserving hay. The following directions for timothy and clover, are applicable to all grasses suitable for hay, as they are all divided into two classes, broad-leaved, and the fine-leaved, or grasses proper. The principles involved in these directions may be considered comparatively well settled, and they are sufficient for all purposes. Cut clover when half the blossoms are dried, and the other half in full bloom. Cut later, the stalks are so dried, that they are of much less value. Cut earlier, it is so immature, as to be of small value for hay. In case of great growth and lodging down, clover may be cut earlier, as it is better to save hay of less value, than to lose the whole. To cure clover for hay, spread it evenly, immediately after the scythe, let it thoroughly wilt, but not dry. Rake it up, before any of the leaves are dry so as to break, and put it in small cocks, such as a man can pitch upon a cart at once or twice with a fork. This should be

laid on and not *rolled* up from a winrow. In the former case it will shed nearly all the water, and the latter method suffers the rain to run down through the whole.

Unless the weather be very wet, clover will cure in this way, without opening until time to haul it in, and will retain its beautiful green color, almost equal to that of England and Germany, cured in the shade, which, at two or three years old, appears almost as bright as though not cured at all. If the weather be quite wet, cut clover when free from dew or rain, wilt it at once, and draw it in, put as much as possible in thin layers on scaffolds, and under cover, to cure in the shade. Put the remainder in alternate layers with equal quantities of dry straw, with one peck of salt to a ton. A ton may bear half a bushel of salt, less is better, and more is injurious to stock, by compelling them to eat too much salt. The most beautiful and palatable clover hay is that cured in the shade, on scaffolds and afterward mowed away.

Timothy should never be cut, until the seed is far enough advanced to grow. Careful experiments have shown that cut in the blossom, the hay will contain only about one half as much nutriment, as when cut in the full-grown seed, but before it commences shelling. Cure as clover, but in twice as large cocks, and never salt, unless compelled to draw in when damp or too green.

HEDGE.

The question of fencing in this country, so much of which is prairie, and in other parts of which there is such a wanton waste of timber, gives great importance to successful hedging. The same plants are not equally good for hedge in all parts of the country. There are but few plants suitable for hedges in our climate.

The Osage Orange—is the best, in all latitudes where it will flourish. It has no diseases or enemies by which it will be destroyed, except too cold winters. Of Southern origin, yet it flourishes in many places at the North. In cold localities, where there is but little snow, it suffers much until three or four years old. It is being extensively introduced into central and northern Illinois, where unusually cold winters destroy vast quantities of young plants, and kill the tops of much old hedge. It is still insisted that it will succeed; but we consider it too uncertain, and consequently too expensive, for general fencing

in such climates. The roots and lower parts of the plants may be preserved, however, by setting them out for a hedge on level ground, instead of ridges as usual, and plowing a furrow three feet from each side of the row, to drain off surplus water. Mulch thoroughly in the fall, and thus protect from frost until they have been set in the hedge for three years, and they may succeed and make a good live fence. To raise the plants, soak the seeds thoroughly, and, at the usual time of corn-planting, plant in straight rows, and keep clean of weeds. Set out in hedge the following spring. The soil of the hedge-row should be deep, mellow, and moderately, not excessively rich. Too rich soil makes a larger growth, of spongy and more tender wood. Plants should have a portion of the tap-root cut off, and be planted a foot apart in the row.

The Hawthorn—will never be extensively cultivated for live fence in this country, being subject to borers, as destructive as in fruit-trees.

The Virginia Thorn—is equally uncertain.

The Buck Thorn—after fifteen years' trial, in New England, bids fair to answer every purpose for American live fence: it is easily propagated, of rapid growth, very hardy, thickens up well at the bottom, and is exempt from the depredations of insects. It may yet prove the great American hedge-shrub.

The Newcastle Thorn—cultivated in New England, is much more beautiful, and promises to rival the buck thorn, but has not been sufficiently tested to settle its claims. Much is anticipated from it.



Shearing down young hedges.



Properly-trimmed hedge (end view)



Badly-trimmed hedge (end view).



Neglected hedge (side view).

There are plants well adapted to hedge at the South, which are too tender for the North. In White's Gardening for the South, we have the following given as hedge-shrubs, adapted to that region: Osage Orange, Pyracanth, Cherokee, and single White Macartney roses. The Macartney, being an evergreen thorn, and said to make as close a hedge as the Osage Orange and much more beautiful, is quite a favorite at the South. They usually train the rose-shrubs for hedge on some kind of paling or wire fence. They render some of them impenetrable even by rabbits or sparrows; this is done by layers, and trimming twice a year, commencing after the first three months' growth. Pruning is the most important matter in the whole business of hedging. A hedge set out ever so well, and composed of the best variety of plants, if left in the weeds, without proper care in trimming, will be nearly useless. A well-trimmed hedge around a fruit-orchard will keep out all fruit-thieves. The great difficulty is the *unwillingness* of cultivators to cut off, so short and so frequently, *the fine growth*.



a *b*
Shearing down young hedges.



Properly-trimmed hedge (end view)



Badly-trimmed hedge (end view).



Neglected hedge (side view).

Shear off the first year's growth (*a*) within three inches of the ground (*b*). Cut the vigorous shoots that will rise from this shearing, four inches higher, about the middle of July, and similar and successive cuttings, each a little longer, in the two following years; these will bring the hedge to a proper height. The form of trimming shown in end view of properly-trimmed hedge, protects the bottom from shade by too much foliage on the top: the effects of that shade are seen in neglected hedge in the cut.

HEMP.

This is one of the staple articles of American agriculture. It is much cultivated in Kentucky and other contiguous states. Its market value is so fluctuating that many farmers are giving up its cultivation. The substance of these directions is taken from an elaborate article from the pen of the honorable Henry Clay. Had not the length of that article rendered it inconsistent with the

plan of this volume, we should have given it to the American people as it came from the hand of their greatest statesman, who was so eminently American in all his sentiments and labors.

Preparation of the Soil—should be as thorough as for flax;—this can not be too strongly insisted on. Much is lost by neglect, under the mistaken notion that hemp will do about as well on coarse, hard land. Plants for seeds should be sown in drills four feet apart, and separate from that designed only for the lint. The stalks should be allowed to stand about eight inches apart in the rows. Plants are male and female, distinguished in the blossoms. When the farina from the blossoms on the male plants (the female plants do not blossom) has generally fallen, pull up the male plants, leaving only the females to mature. Cut the seed-plants after the first hard frost, and carry in wet, so as to avoid loss by shelling. Seed is easily separated by a common flail. After the seeds are thrashed out, they should be spread thin, and thoroughly dried, or their vegetative power will be destroyed by heat or decay. They should be spread to be kept for the next spring's planting, and not be kept in large bulk. Their vegetation is very uncertain after they are a year old. Sow hemp for lint broadcast, when the weather has become warm enough for corn-planting. Opinions vary as to the quantity of seed, from one bushel to two and a half bushels per acre. Probably a bushel and a peck is best. Plowing in the seed is good on old land; rolling is also useful. If it gets up six inches high, so that the leaves cover the ground well, few crops are less effected by the vicissitudes of the weather. Some sow a part of their hemp at different times, that it may not all ripen at once and crowd them in their labor. Cutting it ten days before it is ripe, or allowing it to stand two weeks after, will not materially injure it. Hemp is pulled or cut. Cutting, as near the ground as possible, is the better method. The plants are spread even on the ground and cured; bound up in convenient handfuls and shocked up, and bound around the top as corn. It is an improvement to shake off the leaves well before shocking up. If stacked after a while, and allowed to remain for a year, the improvement in the lint is worth more than the loss of time. There are two methods of rotting—dew-rotting, **and** water-rotting—one by spreading out on grass-land, and the other by immersing in water; the latter is much the preferable mode. The question of sufficient rotting is determined by trial. Hemp is broken and cleaned like flax. The stalks need to be well aired and dried in the sun to facilitate the operation. Extremes in price

have been from three to eight dollars per hundred pounds: five dollars renders it a very profitable crop. Thorough rotting, good cleaning, and neat order, are the conditions of obtaining the first market price. An acre produces from six hundred to one thousand pounds of lint—an average of about one hundred pounds to each foot of height of the stalks. Hemp exhausts the soil but a mere trifle, if at all; the seventeenth successive crop on the same land having proved the best. Nothing leaves the land in better condition for other crops; it kills all the weeds, and leaves the surface smooth and even.

HOEING.

Much depends upon the proper and timely use of the hoe. Never let weeds press you; hoe at proper times, and you never will have any large weeds. As soon as vegetables are up, so that you can do it safely, hoe them. The more frequent the hoeing while plants are young, the larger will be the crop. Premium crops are always hoed very frequently. Hoeing cabbages, corn, and similar smooth plants, when it rains slightly, is nearly equal to a coat of manure. But beans, potatoes, and vines, and whatever has a rough stalk, are much injured by stirring the ground about them while they are wet, or even much damp. We have known promising crops of vines nearly destroyed by hoeing when wet. Hoeing near the roots of vines after they have formed runners one or two feet long, will also nearly ruin them;—the same is true of onions: hoe near them, cutting off the lateral roots, and you will lessen the crop one half. In hoeing, make no high hills except for sweet potatoes. High hilling up originated in England, where their cool, humid, cloudy atmosphere demands it, to secure more warmth. In this country we have to guard more against drought and heat.

HOPS.

These are native in this country, being found, growing spontaneously, by many of our rivers. There are four or five varieties, but no preference has been given to any particular one. Moist, sandy loam is the best soil, though good hops may be grown in abundance on any land suitable for corn or potatoes. Plow the land quite deep in autumn; in the spring, harrow the same way it was plowed. Spread evenly over the surface sixteen cords of manure to

the acre, if your soil be of ordinary richness; cross-plow as deep as the first plowing; furrow out as for potatoes, four feet apart each way. Plant hops in every other hill of every other row, making them eight feet apart each way. Plant all the remaining hills with potatoes. Four cuttings of running roots of hops should be planted in each hill. Many hop-yards are unproductive on account of being too thick;—less than eight feet each way deprives the vines of suitable air and sun, and prevents plowing them with ease. The first year, they only need to be kept clean of weeds by hoeing them with the potatoes. In the fall of the first year, to prevent injury from hard frosts, put a large shovelful of good manure on the top of each hill. Each spring, before the hops are opened, spread on each acre eight cords of manure; coarse straw manure is preferable. Plow both ways at first hoeing. They require three hoeings, the last when in full bloom in the beginning of August. Open the hops every spring by the middle of May; at the South, by the last of April. This is done by making four furrows between the rows, turning them from the hills; the earth is then removed from the roots with a hoe, and all the running roots cut in with a sharp knife within two inches of the main roots. The tops of the main roots must also be cut in, and covered with earth two inches deep. Set the poles on the first springing of the vines; never have more than two poles in a hill, or more than two vines on a pole, and no pole more than sixteen feet high. Neglect this root-pruning, and multiply poles and crowd them with vines, and you will get very few hops. Select the most thrifty vines for the poles, and destroy all the others. Watch them during the summer, that they do not blow down from the poles. They must be picked as soon as they are ripe, and before frosts. The best picking-box is a wooden bin made of light boards, nine feet long, three feet wide, and two and a half feet deep; the poles are laid across this, and the hops picked into it by hand. In gathering hops, cut the vines two feet from the ground, that bleeding may not injure the roots.

Curing is the most important matter in hop-growing. Hops would all be of one quality, and bring the first price, if equally well cured. The following description (with slight abbreviation) of the process of curing, by William Blanchard, Esq., is, perhaps, as complete as anything that can be obtained. Much depends upon having a well-constructed kiln. For the convenience of putting the hops on the kiln, a side hill is generally chosen for its situation; it should be a dry situation. It should be dug out the same bigness at the bottom

as at the top; the side walls laid up perpendicularly, and filled in solid with stone to give it a tunnel form: twelve feet square at the top, two feet square at the bottom, and at least eight feet deep, is deemed a convenient size. On the top of the walls sills are laid, having joists let into them, as for laying a floor, on which laths, about one and a half inches wide, are nailed, leaving open spaces between them three fourths of an inch, over which a thin linen cloth is spread and nailed at the edges to the sills. A board about twelve inches wide is set up on each side of the kiln, on the inner edge of the sill, to form a bin to receive the hops. Fifty pounds, after they are dry, is all such a kiln will hold at once. The larger the stones made use of in the construction of the kiln the better, as it will give a more steady and dense heat. The inside of the kiln should be well plastered with mortar to make it air-tight. Charcoal is the best fuel. Heat the kiln well before putting on the hops; keep a steady and regular heat while drying. Hops must not remain in bulk long after being picked, as they will heat and spoil. Do not stir them while drying. After they are thoroughly dry, remove them into a dry room, and lay in heaps, and not stir unless they are gathering dampness that will change their color; then spread them. This will only occur when they have not been properly dried. They are bagged by laying cloth into a box, so made that it can be removed, and give opportunity to sew up the bag while in the press. The hops are pressed in by a screw. In bulk they will sweat a little, which will begin to subside in about eight days, at which time they should be bagged. If they sweat much and begin to change their color, they must be dried before bagging. The best size for bags is about two hundred and fifty pounds' weight, in a bag about five feet long. Common tow-cloth or Russia-hemp bags are best. Extensive hop-growers build houses over the kiln, that they may be able to use them in wet weather. In this case, keep the doors open as much as possible without letting in the rain. Dried without sufficient air, their color is changed, and their quality and market-value injured. These houses are made much larger than the kiln, in many instances, for the convenience of storing and bagging the hops when dry; in this case, tight partitions should separate the storerooms from the kiln, to avoid dampness from the drying hops.

The form of manuring recommended is contrary to the old practice of putting a little manure only in the hill: that practice exposed vines to decay and destruction by worms, and this does not; our system also produces hops equal to new land.

HORSE.

This noble animal is in general use, and everywhere highly prized. By the last census, we see that there are two thirds as many horses as cows in the United States—4,335,358 horses, and over six millions of cows. But, valuable as is the horse, he suffers much ill treatment and neglect from his master. To give a history of the horse, the various breeds of different countries, and the efforts to improve them, would be interesting, did it fall within the limits of our design. The patronage of the kings and nobility of England has done much to elevate the horse to his present standard of excellence. It has now become the custom for intelligent gentlemen in rural districts, in all enlightened countries, to give much attention to the improvement of horses. Unfortunately, some of that enthusiasm is perverted to the channel of horse-racing, a practice alike injurious to horses and the morals of men. A few brief hints are all we have space for, where a volume would be interesting and useful. The farmer should exercise constant care to improve the breed of his horses: it pays best to raise good horses. This depends upon the qualities of the dam and sire, and upon proper feed and care. This is a subject that farmers should carefully study from books and from their own observation. The most important matter in raising horses, is care in working and feeding. Nineteen out of twenty of all sick horses are made so by bad treatment. The prevention of disease is better than cure. Steady, and even hard work, will not injure a horse that is well and regularly fed. But a few moments of crowding a horse's speed, or of an unnatural strain on his strength, may ruin him. Let it always be remembered that it is speed, and not heavy loads, that most injures a horse. A mile an hour too fast will soon run down your horse. A horse fed with grain, or watered, when warm, is liable to be foundered; and if not so fed as actually to be foundered, he will gradually grow stiff. Horses are liable to take cold by any unreasonable exposure to the weather, in the same circumstances as men, and the effects on health and comfort are very similar. A horse having become warm by driving, should never stand a minute without a blanket. When a man goes from a heated room, or in a perspiration, into inclement weather, he takes cold the moment the cold or storm strikes him: in a few moments the effects on the pores of the body are such that there is no particular exposure. It is so with a horse. He takes cold when you are only going to allow him to "stand but a minute," and during that time you leave him uncovered.

If you are under the necessity of doing an unusual day's work with a horse, do not feed him heavily on that day. Unusual feed the day before and the day after will do him good; but on the day of excessive work it injures him. Never feed horses too much; they will often eat one third more than is good for their health. Keep the bottom of the trough in which you feed your horses grain, plastered over with a mixture of equal parts of salt and ashes, that they may eat a little of it when they please. When the water of your horse becomes thick and yellowish, or whitish, give him a piece of rosin as large as a walnut, pulverized and put in his grain. If a horse has the heaves, give him no hay or oats; corn, ground or soaked, should be his only grain, and green corn-fodder in summer, and cornstalks, cut fine, with a little warm water on them, mixed with meal, should constitute his only food. All except a few of the most confirmed and long-standing cases of heaves are *entirely relieved* by this course of feeding, and that relief is permanent as long as the feed is continued, and it frequently effects a cure so radical that the disease will not return on a change of food. To bring up horses that have had hard usage and poor feed, and to secure growth in colts, feed them milk. The milk of a butter-dairy is not more profitably used in any other way, than fed to horses and colts. Give them no water for two or three days, and they will readily learn to drink all the sour, thick milk you will give them. Colts will grow faster on milk than on any other food.

Horses should be often rubbed down and kept clean, and when put in the stable wet, they should be rubbed dry. It is very essential to the health of a horse that he have pure air. Stables in this country are usually airy enough. But if the stable be tight, it should be well ventilated. The gases from a wet stable floor are injurious. Disinfecting agents are good remedies; a little plaster-of-Paris spread over a stable-floor is very useful. These brief directions, followed, will prevent most of the diseases to which horses are subject; or in case a horse be attacked, he will have the disease lightly, as temperate men do epidemics.

HORSERADISH.

This is regarded a healthy condiment, especially in the spring of the year. Grated, with a little vinegar, it may be eaten with any food you choose. Small shavings of the root are esteemed in mangoes. When steeped in vinegar for

two weeks, it is said effectually to remove freckles from the face. Any pieces of the roots will grow in any good garden-soil. Larger and better roots may be produced, by trenching the bed two feet deep, and putting in the bottom, ten inches of good manure, and planting selected roots, about six inches deep.

HOTBEDS.

These are designed to force an early growth of plants. It is done by the use of solar heat, and that arising from fermenting manures, combined. The following directions for constructing and managing hotbeds will enable every one to be successful. Nail boards on pieces of scantling placed in the inside corners, in the form of a box, sixteen feet long and six feet wide; make it three and a half feet high on the back-side, and two feet high in front, facing the sun; nail a piece of board across the middle, let in at the top, to prevent the box from spreading when filled. Fill that with good, fresh horse-manure, with but little straw; tread it down firmly. Put over the whole, sashes made with cross-pieces but one way, and filled with glass, lapped half an inch, like shingles on a roof, to carry off the rain; putty in the glass lightly, or it may adhere to fresh-painted frames; let the frames be halved on their edges, so as to lap and be tight; put these over the filled hotbed, perfectly fitted all around, and enough of them to cover the whole bed; in two or three days the manure will become pretty warm, when it should be covered, four inches deep, with rich mould, sheltered for the purpose the previous fall, and the seeds planted. When the plants come up, see that they are kept sufficiently moist, and not have the hot sun pour upon them intensely, and they will grow rapidly; when too warm, they should be partly covered with mats, and the frames raised to let in air. Put small wedges between the sash and the boards, which will let in sufficient air. Keep it closed when the air is cold, and covered with mats when the sun is too hot. Plants are often destroyed by over-heating. When in danger of freezing, cover closely with mats or straw, or both. We have had plants growing in such a bed when the thermometer stood eight degrees below zero. If the heat of the manure subsides too early, pack fresh horse-manure all around the outside of the box, and as it heats it will communicate warmth to the inside of the bed. As plants grow up, transplant a part to a fresh bed, so as to give all a chance to grow stocky and strong. Almost everything that grows in the garden may be forwarded greatly in the hotbed. Vines, beets, tomatoes, cabbages, peppers, egg-plants, celery, beans, corn, and

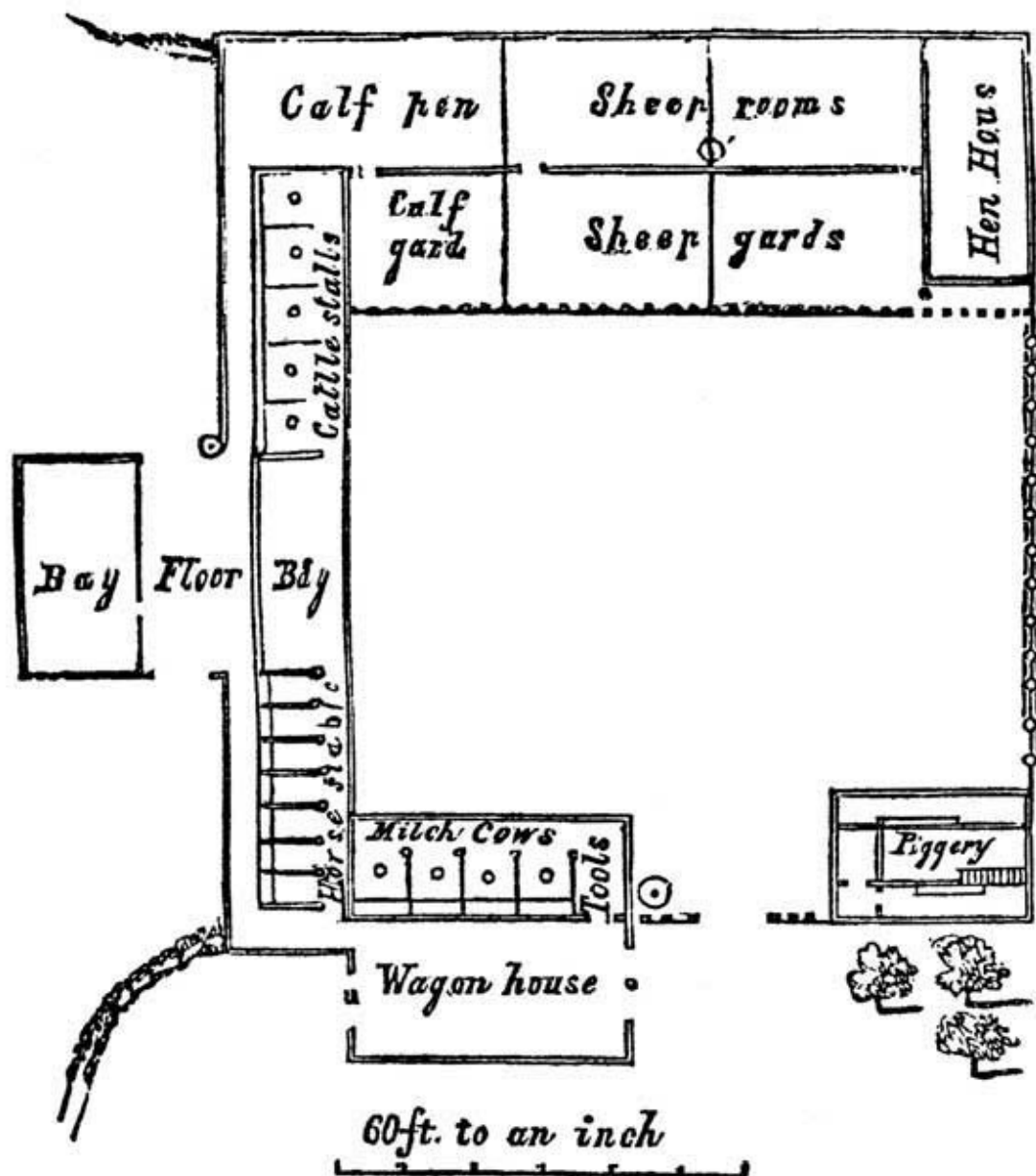
potatoes, may be obtained much earlier by this means. Those that are injured most by transplanting should be planted in the hotbed, on inverted sods, or grass turfs, six inches square, which can be removed with the growing plants on them, without seriously disturbing the roots. Plenty of shade and moisture on transplanting will save the most tender plants, and they will speedily recover. Make a hotbed of any size you may desire on the same principle. The boards and frames will last many years, with proper care, and occasional supply of a broken light of glass. Into such sash, broken glass of any size can be put, by cutting it to a proper width in one direction, no matter how far the points lap.

HOUSES.

It is not our design to give an extended view of rural architecture. But this work can not be complete without a brief notice of farm-buildings, and a few plans for such buildings, adapted to the wants of those possessing limited means. We hope these directions and plans will prove important aids in getting up cheap, yet convenient and beautiful, country residences, especially in all the newer parts of the country. Our reading on rural architecture, and an extensive observation in many states of the Union, have made us acquainted with nothing, combining beauty, cheapness, and utility, better than the following.

The scale at the bottom will enable any mechanic to determine the size of each of these buildings, and their relation to each other. They can, on the same general plan, be made of any dimensions, to suit the wishes of the proprietor.

The wagon-house in the range is forty feet long, affording ample shelter for all kinds of vehicles, connected by a covered way with the horse-stables and barn-floor.

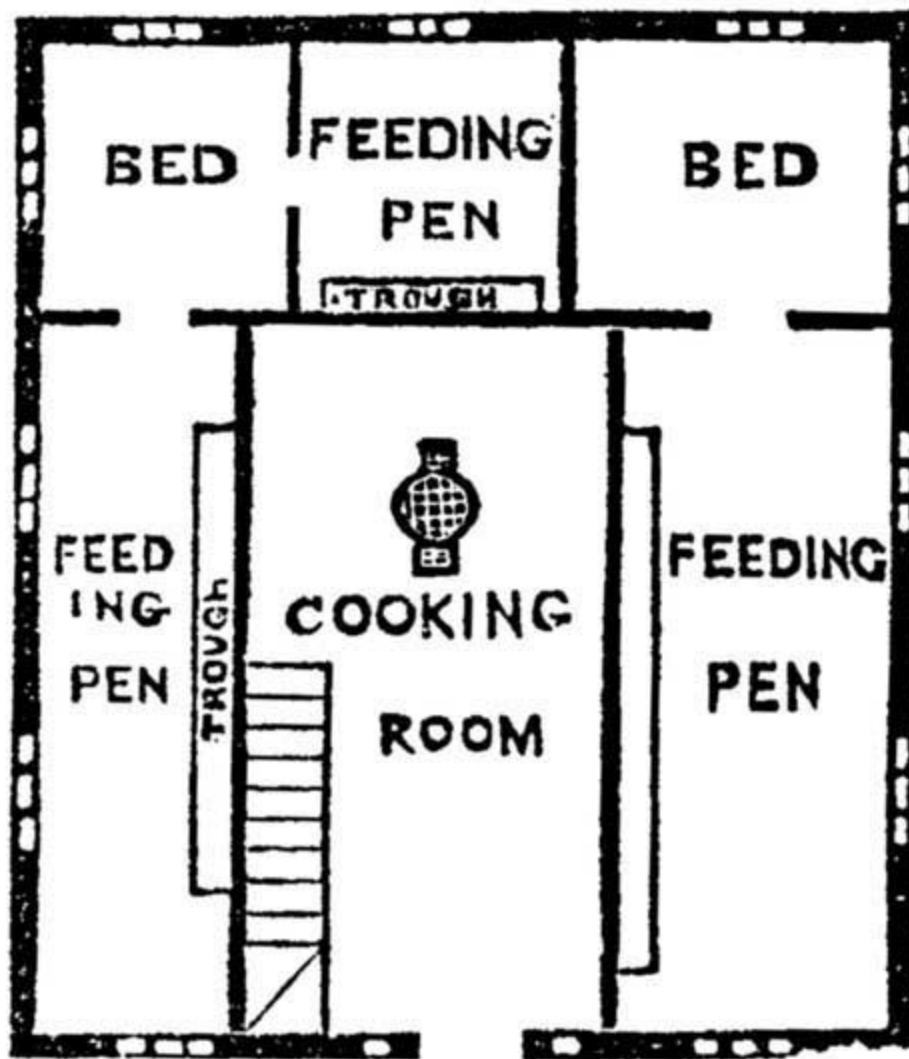


Range of Farm-Buildings.

A lean-to is built on the north side of the wagon-house, in which is a tool-house opening into it, and a stable for eight milch-cows, that will thus be convenient for winter-milking; these cows are fed from the loft over the wagon-house. The barn is thirty by forty feet, with floor in the middle and bay on each side: this can be driven into on one side and out on the other. From the floor is a covered way to cattle and horse stables, and into the wagon and tool house, without going outdoor.

The Piggery.—Large and small swine do not do so well together; hence, the larger ones are to occupy the feeding-pen and bed on the right (in the cut), those of medium size on the left, and the smaller ones in the rear. The dimensions and relative size of apartments can be determined from the plan.

The other buildings sufficiently explain themselves in the cut.

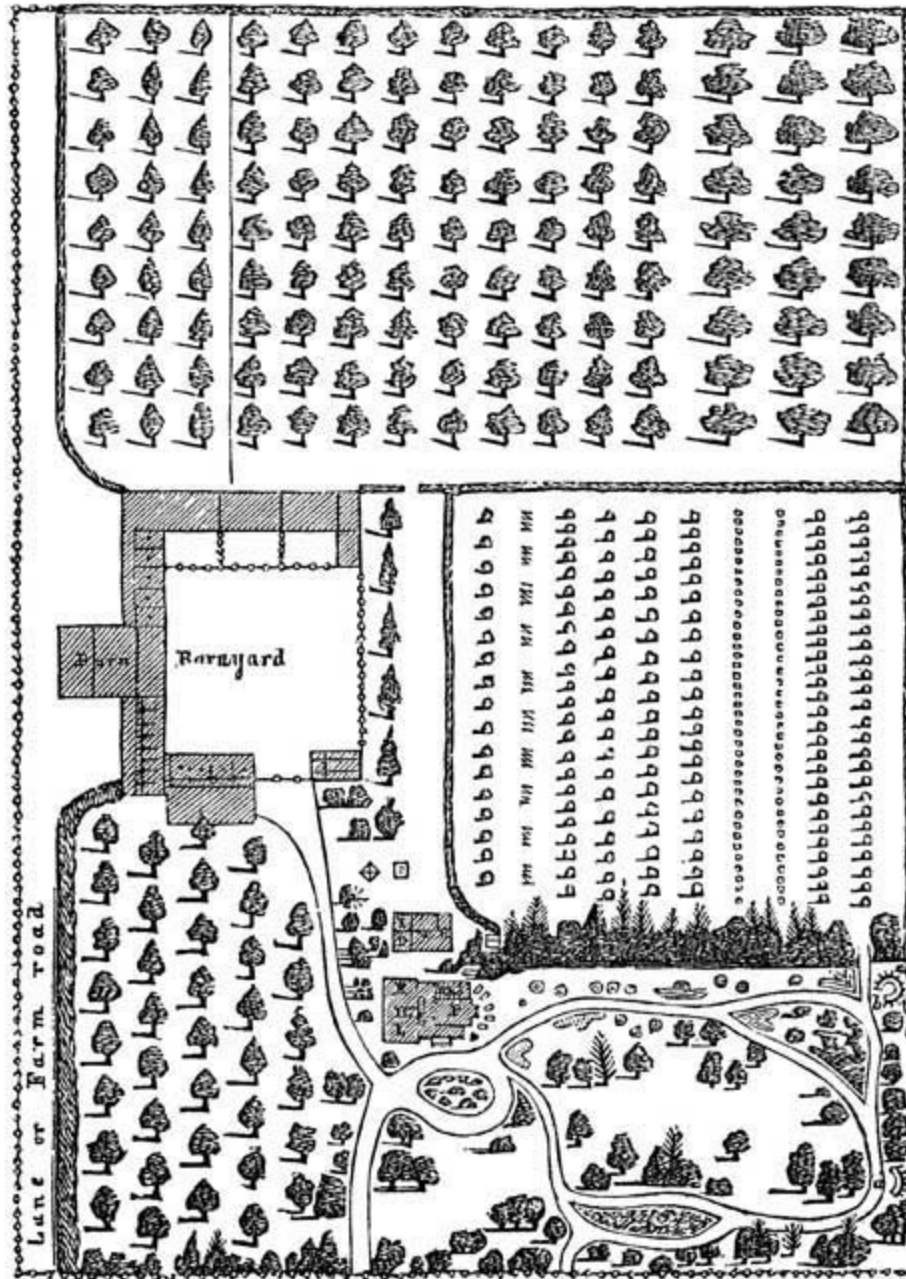


Ground-plan of Piggery.

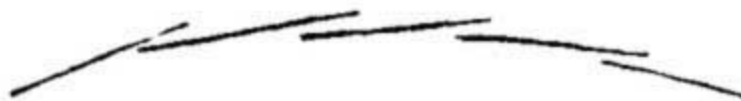
With this range of buildings, let a farmer do his own thrashing, with a small horse-power, and thrash a part at a time during the winter, keeping the straw in an apartment in the bay, dry for litter, and for cut feed for cattle and horses, and it will be the best and most economical method of thrashing and keeping

stock. Every farmer should do at least a part of his thrashing in this way, during the winter, for the benefit of fresh straw, &c.

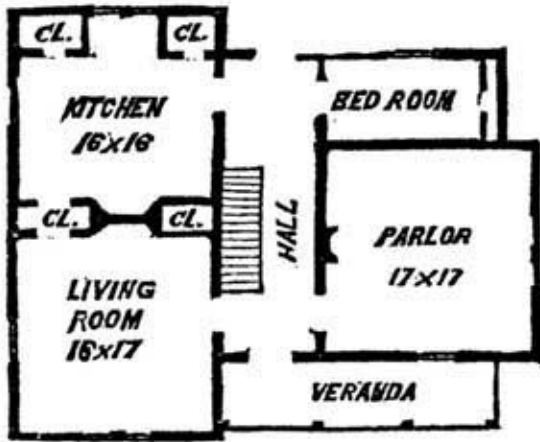
Country Residence.—This includes the range of buildings given opposite, their distance from the house, and all the parts of a complete residence, with all the comforts and conveniences that can be crowded into such a space, and at a very reasonable expense. Three fourths of an acre are devoted to the ornamental grounds; except the walks and small flower-beds, it is all green turf. Plowed very deep and thoroughly enriched, the trees are set out, and all then made very level, and one and a half bushels grass-seed sown on it and brushed in very smooth. This soon makes a very thick green turf, to be cut every ten days during the most growing season, and less frequently as the season advances. The trees, for a few years, need careful working around and mulching. The gravel carriage-road is twelve feet wide, and winding around shrubbery, it leads to the carriage-house in the range of buildings. The foot-walks are five feet wide. The curves in the walks may be accurately laid out in the following manner. Determine the general position by a few points measured off. Lay a pole upon the ground, in the direction of the walk; stick a peg in the ground at the first end and at its middle; move the pole round a little, leaving the middle the same,—then stick a peg at its end, and move it forward—moving it forward and round equally, each time, by measurement. A longer or shorter curve is made by a greater or less side-movement of the pole. In a regular curve, the movements are the same; but in going from a shorter to a longer, or from a longer to a shorter curve, the side-measurement must increase or diminish regularly.



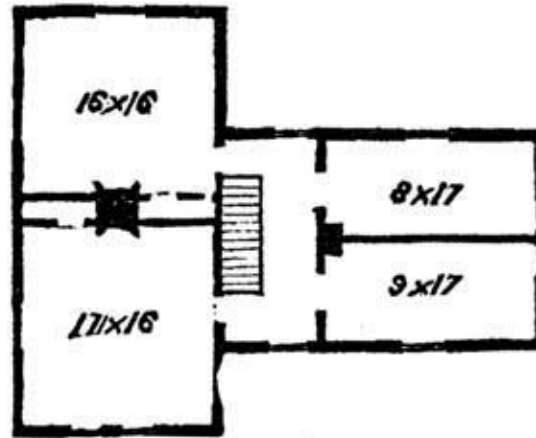
Country Residence, Farm Buildings, Grounds, and Fruit-Gardens.



Laying out Curves.



First floor.



Chambers.

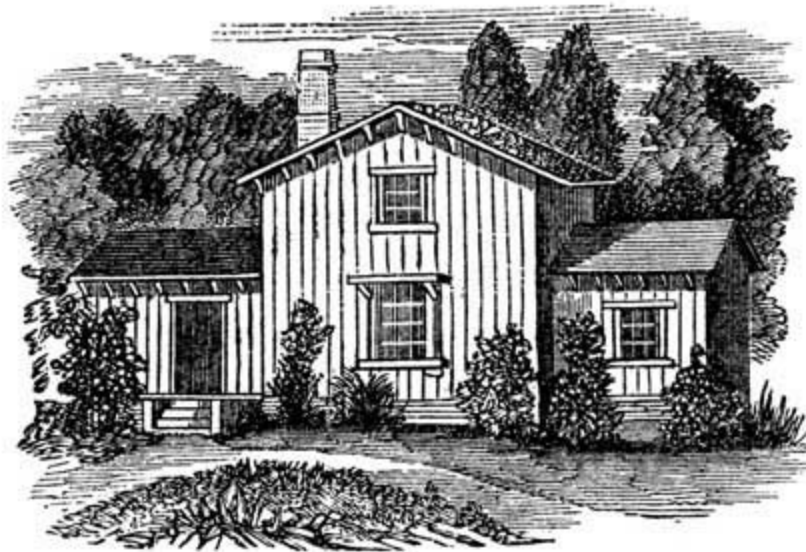


Summer-house.

The following cuts show the plan of the house: three principal rooms and a bed-room below, and four rooms above. The hall extends through the house, affording good ventilation in summer, and entrance to each room, without passing through another. The chimney in the centre economizes heat. This small and cheap house affords more conveniences than most large ones. One of the finest things about such a house is a good cellar. For a farm-house, the cellar should be under the whole; make it eight

feet deep, gravel and water lime made smooth on the bottom, flagging under the bottom of the wall extending out a foot, the wall above ground built double, the inside four inches thick, with brick, with a space of two inches, and outside stone wall a foot thick. The windows should be double and well fitted, the inside one hung on hinges; the outside one to be removed in spring, and its place supplied with a well-fitted frame, covered with wire-cloth to

admit air and exclude intruders during summer. This will not freeze, and never need banking. No rat can enter, for they always work close to the wall, and coming to the projecting flat stone at the bottom, they give it up. On one side of the cellar, under the kitchen, make a large rain-water cistern, with a pump in the kitchen and a faucet in the cellar, and the whole arrangement is perfect. If the farm be large, you will need some of the good, but cheap houses described in the following part of this article, where your men will live and board themselves, which is always the best and cheapest way. An open view from the house in the country residence extends to the summer-house (*b*) on the right. This is one of the neatest cheap summer-houses that can be made. The following directions for making it may be useful. Set eight cedar posts, six inches in diameter, in the ground, in a circle; saw them off even at the top, and connect them by plank nailed on their tops. Make an eight-sided roof of boards; nail lath from post to post, forming lattice-work, leaving a space between two posts for a door. Put a seat around on the inside. Leave all the materials except the seat unplanned, and cover with a white or brown wash, and it need not cost more than five or six dollars, and, covered with vines of some kind, it will be ornamental.



Laborer's Cottage.



Plan of Laborer's Cottage.

This form of a cheap house is convenient and pleasant. Built of four-inch scantling, the plates and sills being connected only by the upright plank, and the wings thoroughly bracing the upright posts; when lumber is cheap, it may be built for one hundred and fifty or two hundred dollars, with cellar, well, and cistern. Occasional whitewash is as good as paint. With cellar under the whole, filled in with brick, and having blinds, it may cost three hundred and fifty dollars. The plan of the house sufficiently explains itself.

The next cut illustrates a neat country-house, for a family who think more of neatness, comfort, and intellectual pursuits, than of mere ornament, and may serve the purpose of a farmhouse, or the residence of a retired or professional gentleman. It has the unconstrained air of the Italian style, without a rigid adherence to any rules, and may therefore be altered or added to without destroying its effect.



Italian Farmhouse.



Plan of Italian Farm House.

The plan is intelligible without explanation. Built in a plain way, the four large rooms not larger than fifteen by seventeen, and ten feet high, plain in its finish, it would cost about sixteen hundred dollars complete. It may go up from that, according to size and height of rooms, and style of finish, to three thousand dollars. It then makes as good a house as any person ever need to occupy, out of great cities.

HYBRIDS.

Although this subject has received far too little attention, yet our limits will only allow us to mention a few facts, of the most practical moment.

Plants hybridize only through their blossoms. This can only occur in plants of similarity, in nature and habits. Squashes and pumpkins planted near each other mix badly, and the poorer will prevail. Varieties of corn mix at considerable distances, by the falling of pollen from the tassel upon the silk of another variety. Watermelons are always ruined by being planted near citrons. The seeds from melons so grown will not produce one good melon. How far watermelons and muskmelons, or squashes with melons, will hybridize, is uncertain. By planting nutmeg muskmelons with the common roughskinned variety, we have produced a kind about half way between them, that was of great excellence. Two kinds of cabbage or turnip seed should never be raised in the same garden. Cabbage and turnip seed raised near together is valueless. In strawberries, different plants are essential to each other, the quality of the fruit being determined by the plant fertilized, and not by the fertilizer. This subject is further treated under articles on different plants.

INARCHING.

This is a method of effecting a union of trees or branches, while both retain their hold in the ground. Shave off a little wood from each, and put them together, fitting closely, so that the barks will meet, as in grafting; tie firmly, and cover with wax. When they have got well to growing, cut off the top of the old one, and after a while cut the new one from the ground. When you have a tree that it is difficult to propagate in the usual way, you may transplant it to a thrifty stock. Vigorous branches may by this means be transferred to old, poor-bearing, or slow-growing trees. So also may a tree be prolonged beyond its ordinary age, as the pear on the quince, by inarching young shoots. We can only recommend this to the curious experimenter, who has little else to do.

INSECTS.

These are the natural enemies of fruits and plants; and to prevent their depredations requires much care. There is no universal remedy. Birds and young fowls—especially ducks and chickens—are useful in a garden. The ducks must not be kept there too long. They will appropriate a little to their own use, but will save much more for the proprietor. Insects have their peculiar tastes for particular fruits and plants, of which we have treated, under those heads, respectively. Success in many branches of horticulture and pomology, depends upon attention to the habits of insects. The most general remedy is to wash trees or plants with a strong decoction of some offensive herb, or with whale-oil soapsuds. Tobacco is very useful for this purpose.

IRON FILINGS.

It has been ascertained by analysis, that iron enters largely into the composition of the pear. Iron filings spread under them, or worked into the soil, increases the growth of pear-trees, and improves the quality of the fruit.

IRRIGATION.

This is one of the most important matters, that can engage the attention of agriculturists of the present day. A stream of water that may be caused to flow gently over a field, or different parts of a farm, at pleasure, is a mine of wealth. Plants receive their food from the air and water. We shall discuss this more fully when treating of manures. A poor, porous, sandy, or gravelly soil usually produces a fine crop, in a wet season. That is an addition to the soil of nothing but water. Hence all springs and streams can be turned to great account, on a farm or garden. Watering gardens by hand or with a garden-pump, will often pay better than any other expenditure on the land. Employing a man, in a dry season, to spend his whole time in watering five acres of garden, of berries and vegetables, as cabbages, vines, onions, and potatoes, will pay a very large profit. Strawberries will bear twice as much and twice as long, for daily watering, after they begin to bud for blossoms, until the fruit is gone. It is a necessary caution not to water irregularly, and only occasionally, in a dry season. Better not commence than to leave off, or neglect it in a dry time, before a rain. Read further in our article on "Watering."

LABELS.

It is important, on many accounts, to have fruit-trees and shrubs well labelled. Many labels have been invented. We prefer Cole's, as given in his Fruit Book, to any other. Take a piece of sound pine or other soft wood, whittle two sides smooth, leaving one wider than the other, with a sharp corner between them. For one, cut one notch in the edge, and so up to four, four notches for four. For five, cut across the narrow side. For ten cut across the wide side, and a notch for every ten up to forty. For fifty, cut obliquely across the narrow side, and for one hundred cut obliquely across the wide side. Keep the names in a book, with numbers corresponding with the notches or numbers on the labels.

Fasten these to trees, loosely, by a small copper or brass wire. Transported to any distance, exposed to any weather, or buried in the ground, they will not be obliterated. Pieces of sheet lead, tin, or zinc, cut wide at one end, and written on with a sharp awl, and narrow at the other end, to be bent around a limb, will answer a pretty good purpose. Any soft wood, made smooth, and a little white paint applied, and written on with a good pencil, will preserve the mark for a long time. Fasten with small wire. There are many labels, but we know none preferable to the above. By all means make labels accurate and permanent. Otherwise great losses may occur by budding or grafting from wrong varieties.

LANDSCAPE GARDENS.

These deserve much more attention than they receive in this country. On most farms land enough is lying waste, to make a picturesque landscape, at a small expense. Trees planted, weeds destroyed, grass cultivated, and paths made, according to the most approved rules of carelessness, would secure this object. With a wealthy man, the omission of such a park about his dwelling is hardly pardonable. Landscape gardening is an extensive subject. We can only give a few of the most general simple rules, that may be practised, without the possession of very large means.

1. Place the house some distance from the main street.
2. Make the carriage-way leading to the house, at least twelve feet wide, and

do not allow it to extend in a straight line, but in gentle curves, around clusters of trees and plats of grass, apparently rendering the curves necessary.

3. Have no large trees directly in front of the house.

4. Plant trees of the thickest and greenest foliage near the house, and those of more open tops at a greater distance. Standard pear, and handsome cherry trees, do well planted among the forest trees. Clusters of them, at suitable distances, are not only beautiful, but they bear exceedingly well. They are well protected by the forest trees, and standing alone are injured less by insects.

5. Never set trees in a landscape garden, in straight rows, nor trees of similar size and form together. Nature never does so.

6. Let none of the walks be straight lines, but curves, meandering among trees and grass. If there be any water in the vicinity, let there be an open space, giving a fair view of it from the house. If you have a stream, make rustic bridges over it, the plainer the better. Here and there have rustic arbors. Attached to all this should be three other gardens, one of flowers, another of vegetables, and the third of fruits. These three should never grow together. Fruit-trees ruin vegetables and injure flowers. And flowers in a vegetable garden are mere weeds. A separate plat for each is the correct rule, both for beauty and profit. All this need require but little time and expense. All landholders can, at a moderate cost, live amid scenes of perpetual beauty, while the rich may spend as much money in this way as they choose.

LAYERING.

This is a method of propagation, by bending down a branch, and fastening it under the soil, leaving the upper end projecting, until it takes root. Cut half way through the branch so as to raise the top, and fasten it at the point where it is cut, in a trench, with a stick thrust into the ground over it nearly horizontally, or with a stick having a hook made by cutting off a limb. Cover well with soil, and mulch it, and water when dry. This done in the spring, in August the branch will be well rooted, and may be cut away from the parent stalk. This is important in any tree or shrub (like the snowball), difficult to propagate by slips or grafting.

LAYING IN TREES.

Dig a trench where water will not stand, and lay the trees in at an angle of forty-five degrees, and cover the roots and lower part, very closely, with earth. In this way they may be well preserved through the winter, if buried so deep that the tap-root will not freeze, which is always injurious to trees that have been removed from their original soil. Such freezing is always destructive to trees out of the ground. Small trees and seedlings may be covered entirely, to be kept through the winter. Put coarse straw manure on the earth, over trees large enough for setting, that are to be preserved heeled in during winter; and straw or corn-fodder over the tops, during the coldest weather, and they will come out perfect in the spring.

If not ready to set out your trees at once, you may preserve them in perfect condition to very late in spring, in this way, by raising them once, to check vegetation, and putting them back, and shading their stems and mulching the roots, after the commencement of warm weather. Trees may thus be preserved in better condition for transplanting than those left in the nursery, and they will make a larger growth the first season.

LEEKES.

These are said to be natives of Switzerland. We think this doubtful, as they are an article of daily food in Egypt, and were so highly esteemed there, centuries ago, as to become an object of worship. They are used as a pot-herb, to give a flavor to soups and stews. They are not bulbous, like onions, but have a long stem, which is principally used. They are transplanted very deep, so as to obtain a long white neck. The ends of the roots are to be cut off when transplanted, and they should be set in rows a foot apart, and from four to six inches in the row. There are several varieties, distinguished mainly by the width of the leaves,—the *Flanders* (or *narrow-leaved*), the *Scotch*, and the *Broad London*.

We know no use of leeks for which onions would not be equally good, and, hence, do not recommend their cultivation.

LEMON.

This is the finest acid fruit grown, and belongs to warm climates; but by getting good budded trees from the South, and setting in glass-houses, protected from severe frosts, we may grow lemons in abundance at the North.

By a system of acclimation and protection, we anticipate seeing oranges and other Southern fruits grown at the North as a domestic luxury, and perhaps at a profit for market. The houses necessary for protection may be worth more for other purposes than their cost and care, without interfering with their use for orange and lemon culture.

LETTUCE.

The varieties are numerous, and most of them do well on very rich land, well hoed. Only two kinds of summer-lettuce need be cultivated—the *ice-head lettuce*, and the *brown*. The ice-head has a very thick and tender leaf, continuing to be excellent up to midsummer, from one sowing; and if not allowed to stand nearer together than six inches, it will produce fine heads. The brown lettuce is very large and very good. There are other, earlier kinds, and many others that form large heads. But we can get the above kinds early, by sowing in a hotbed and transplanting; or by sowing so as to have plants get of considerable size in the fall, and protect by covering in winter. These will be suitable for the table early in the spring. Lettuce does better for transplanting; it forms larger heads than in the original bed, and is a little later. Make the soil very rich with stable-manure. Lettuce is more affected by the quality of the soil than most other vegetables. This is a pleasant and healthy article of food, in spring and early summer.

LICORICE.

This is a hardy plant from Southern Europe. The root in substance, or the extracted dried juice, is much used. Needs a deep, rich soil. It is propagated by cuttings of roots set out in deeply-trenched land, in rows three feet apart, and one foot in the row. Small vegetables may be grown among the plants the first year; afterward keep clear of weeds, and manure every autumn. At the end of the third year, after the leaves are dead, take up the roots and dry them thoroughly. This does well at the South. A few roots are sufficient for a family, and the demand will not be sufficient to require its culture very

extensively as an article of commerce. The low price of labor in Southern Europe enables them to supply the demand cheaper than can be afforded in this country.

LIME.

This is a valuable application to the soil. For wheat it is very important, except on soil containing a large proportion of calcareous matter. Usually air-slaked, and applied as a top-dressing, or plowed or harrowed in, its effects are important. On moist, sour land, producing wild grass, it corrects the acidity, introduces other grass, and prepares the soil for cultivation. On hard, stiff lands, it has a tendency to make them friable, and keep them in a mellow condition, thus saving more than its cost, in the labor of cultivation. Very valuable in a compost heap. So much may be applied as to burn the soil and prove injurious. It will not do as a substitute for everything else. See further on "Manures."

LIME.

A fruit resembling the lemon, growing in the same climate, but of smaller size. It is used for the same purposes as the lemon, but is not so valuable. Preserved green, it is highly esteemed. It is cultivated as the orange and lemon, needing the same protection in cold climates. To preserve all these from destruction by insects, wash them in a strong decoction of bitter or offensive herbs, or with whale-oil soap-suds; tobacco is very effectual. These remedies are useful on all fruit-trees.

LOCATION.

This is important to everything we cultivate. But, as everything can not have the best location, we should study it with reference to those things most affected by it, especially fruits. Fruits escape late frosts when growing near rills or small brooks. Orchards near the shores of bodies of water—as on Lake Erie about Cleveland, Ohio—bear luxuriantly when all fruit a few miles back is cut off by late frosts. On the summits of hills, fruits escape late frosts, when they are all cut off in the valleys below. On the Ohio river above

Cincinnati, peaches are very liable to destruction by late frosts. We have seen them all frozen through in one night, and turned black the next day, in the month of May, after they had grown to the size of marrowfat-peas. One season, when there were no peaches in any other locality within a hundred miles, we knew an orchard, on a Kentucky hill, so high and steep, that it took miles of winding around the hill, to ascend it with a team. Those trees were perfectly loaded with peaches, that sold on the tree at four dollars per bushel, and in Cincinnati market at seven to eight dollars. In Ohio, Kentucky, and Virginia, there are such hills, that may be turned to more valuable account than any of the rest of their land, that are not now considered good for anything—even for sheep-pastures. The same is true in the hilly parts of all the states. Good fruit of some kind will grow on them all, every year.

LOCUST-TREES.

It will soon be a great object with American farmers to cultivate locust-trees, in all locations to which they are adapted. Even in this new world, we shall soon be dependent on cultivated timber for fence-posts, railroad-ties, and building purposes. Our native forests are rapidly disappearing, while demand for timber is as rapidly increasing. Probably no other tree is so profitable for cultivation in this country as the locust. It is of rapid growth, and hard and durable, and adapted to many uses. The second-growth locust is not so durable as the native forest-tree, as found in parts of Ohio; but, cut at a suitable age and at the right season of the year, it is as durable as white cedar, and much more valuable. The profits of the culture would be great. An acre of locust-trees fifteen or twenty years old would be worth fifteen hundred or two thousand dollars. The expense of growing it, aside from the use of the land, would be trifling. The grove would afford a good place for fowls, while the blossoms would be nearly equal to white clover for honey. The limbs would make excellent wood, and the ground would need no planting for a second growth. Fortunate will be the men on the prairies of the West, and along the railroads and rivers of the land, who shall early plant fields of locust. The profits of it will greatly exceed the increase in the value of the land.

MANURES.

Soils, manures, and preparing the soil—plowing, harrowing, &c.—are the three great subjects in any good agricultural work. We shall treat this subject under the following divisions:—

1. The substances of which manures are composed.
2. Preparation and saving of manures.
3. Time and modes of application.
4. The principles of their action upon plants.

Manures are of two classes—called putrescent and fossil. The putrescent are composed of decayed, or decaying, vegetable and animal substances. The fossil are those dug from the earth, as lime, marl, and gypsum. All vegetable substances not useful for other purposes are valuable for manure. Rotten wood, leaves, straw, and all the vegetable parts of stable manure, and any spoiled vegetables or grain, are all valuable. At the South, their immense quantities of cotton-seed are a mine of wealth, if properly prepared and applied as manure. Animal manures consist of the animal parts of stable manure, dry and liquid, parts of bones, brine, spoiled meat, kitchen slops, soapsuds, and all dead animals. In decaying, these substances all pass through a process of fermentation. Left exposed without suitable care, they become unhealthy and offensive. It is probable that a large share of the diseases suffered in the rural districts are caused by these impurities; and the impossibility of keeping large cities free from these substances is the cause of their increased mortality. In the country, a little timely caution and labor, in removing these substances and regulating their fermentation, would save much sickness; while the labor would pay a larger per-cent. profit than any other performed on the soil. No manures should be allowed to ferment, or decay, without being mixed or covered with enough common earth, sand, peat, or muck, to retain all the gases and exhalations of such putrescence. The smallest quantity that will answer is one load of earth to two of the decaying substances. The proportions reversed would be better: put one bushel of lime to two loads, two quarts of ground plaster, and half a bushel of ashes, and you have the very best compost heap. The following are brief general rules for the preparation of manures. It is always most economical to feed cattle in the stable or under cover, and never have manure exposed to the weather. But if cattle must be fed outdoor, let them be fed in a yard, lowest in the centre, that

the liquids and washings may run into the centre, and be absorbed by straw and litter. Put manure on the land, or into heaps for compost, before very warm weather. Always feed sheep under cover, and keep their manure from rain; heap it together with earth in the spring, or apply it to the soil at once. Manure thrown out of a stable should be kept under cover, out of the rain, and not allowed to heat in winter; its best qualities are evaporated by fermentation in the yard. Manures often rained on in winter, or left in large piles without intermixture of earth, lime, plaster, and ashes, will ferment and waste. Construct your stables so that the liquid manure will run into a vat filled with earth; muck is best. Experiments have shown that the liquid manures are at least one sixth better than the solid. A gentleman dug a pit, thirty-six feet square and four feet deep, and walled it in on all sides. He filled his vat from a cultivated field, and so constructed his sewers from the stables adjoining that the urine saturated the whole. He kept fourteen head of cattle there for five months, allowing none but the liquid part of the manure to pass into the vat. He spread forty loads of this on an acre. For ten years he tried equal quantities of this and well rotted and prepared stable-manure, side by side, in the same field, and obtained great crops; but in no stage of their growth could he see that crops on the land manured from the stable were any better than those that had received only the soil from the vat. The latter were quite as good as the former. The contents of his vat manured seven acres, or half an acre to each creature stabled. The result is proof that one cow discharges urine sufficient in five months to manure abundantly half an acre of land. Save the solid manure equally well, and a cow will make manure enough, in five or six months, to increase a crop sufficiently to pay for herself. It is certainly safe to say, that a careful man can make the manure of a cow pay for her body every year. Is not this an important branch of farming operations? Few pay sufficient attention to it. Fowls should roost where their droppings may be mixed with common garden soil or loam. The manure from each fowl, carefully saved and judiciously applied, will pay for its body twice a year. The hogstye may be very productive of manure, one fourth better than that from the stable. Connected with your hogpen, have a yard fifteen feet square for every five hogs; let that yard have no floor. Throw the straw out of their sleeping-room frequently to make room for new; throw into the yard, also, all sorts of weeds, refuse vegetables, corn-husks, peapods, &c.; also the dirt that will naturally accumulate in the backyard of a dwelling, including sawdust, fine chips, cleanings of cellars, scrapings of ditches, and

occasionally a load of loam, muck, or clay—and six loads of manure to each hog may be made, that will prove far better than any stable manure; it has been known to produce fifty bushels of corn to the acre, when stable-manure produced but forty bushels. Old wood, brush, and chips, should never be allowed to remain on uncultivated, useless land. Wood throws out the same amount of heat in decaying as it does when consumed as fuel. The action of that heat on the soil is highly beneficial, retaining it long in a mellow state: hence, all wood, too old to be of value for any other purpose, should be put in heaps, covered up till decomposed, and then applied to the soil, as other manures. For potatoes or vines, but especially melons, it is preferable to any other manure. Nothing is so good for muskmelons as old chips from the woodyard. Leaves of fruit and forest trees are also very good; blood and offal of animals, hair, hoofs, bones, horns, refuse feathers, woollen rags, mud from sewers, rivers, roads, swamps, or ponds, turf, ashes, old brine, soapsuds, all kinds of fish, oyster and clam shells—all are valuable, and no part of them should ever be thrown away or wasted; they are all good in compost heaps, or applied directly to the soil. Bones are best ground, but may be used whole, pounded, or chemically dissolved, or mixed with alternate layers of fresh horse-manure, they will be decomposed by the fermentation of the manure (see "Bones"). Perhaps there is as much imprudence in wasting manures as in any part of American domestic economy. One who leaves his stock without care, and so exposed to the weather as to lose half of them and injure the others, is not fit to be a farmer; yet, many waste manure that would produce plants for man and beast, of far more value than the loss of stock complained of, and yet no one notices it—it is a matter of course, exciting no surprise. Wastefulness in a family, if it be of bread, flour, or meat, is considered wicked and impoverishing; while ten times that amount may be wasted in manures, that would enrich the soil, and excite little or no disapprobation. We hope the agricultural periodicals will keep this subject before the people, until these mines of wealth will no longer be neglected or wasted.

Application of Manures is a subject that has been much discussed, and respecting which, intelligent agriculturists differ materially. Some apply them extensively as a top-dressing for grass lands. This does much good, but probably one half of their virtues is lost by washing rains, and by evaporation. A better way is not to keep land down in grass long at a time, and, when under the plow, manure thoroughly. We knew a piece of light land

that annually produced half a ton of hay per acre. The owner plowed it up, raised a crop, put a moderate quantity of stable-manure, and ten loads of leached ashes to the acre. We saw it in haying time, the third season after it had been manured and subsoiled and seeded down, and they were then taking fully three tons of timothy hay from an acre, which was the quantity it had yielded three years in succession, without any top-dressing. If a top-dressing of manure is to be applied, harrow the land quite thoroughly, and always apply the manure in the fall—it is worth twice as much as when applied in the spring. The rains and snows of winter cause it to sink into the soil, while the heat of spring and summer evaporate it. A mixture of plaster, lime, ashes, and a very little salt, sowed on meadows, immediately after haying, secures a good growth of feed, much sooner than it will come on other meadows. It also increases, quite considerably, the hay crop of the following season. It is a universal rule not to allow manure to lie long on the surface to which it is applied, before plowing in. Place manure in heaps, as large as will be convenient for spreading, and spread it just before the plow. Never spread manure one day to be plowed in the next. When manuring in the hill, have the planters follow the manure-cart. In manuring potatoes in the hill, drop the potatoes, and put the manure on them and cover at once. In a dry season, the yield will be double that of those planted in the usual way. For fall grains, plow in the manure, just before sowing the seed. This is better than plowing it in under the sod. If the land be not sod land, and you can plow the manure in only deep enough to cover it, and then, just before sowing the seed, plow again very deep, the effect is excellent. Apply manure to land in the fall, or just after harvest, and plow it in, let the land remain till spring, and then plow deep, and you get the best possible effect. On an onion crop, manure does the most good on the surface. On those raised from sets, or on any onions, after they get large enough to give room, put fine manure enough to keep down all weeds, and it will double the crop.

Gypsum is better sowed than in any other way. Mixed with a little lime and salt, or wood-ashes and salt, the effect on corn is better than from either alone. To hoed crops apply these articles twice, and always by sowing, and not by putting it around or upon the hills; the effect is much greater sowed, besides the labor that is saved. In applying guano, do not allow it to come in contact with the plants, as it is apt to destroy them.

It only remains to consider the principles on which manure acts upon soils,

and produces growth in plants. The action of manure on the soil, by which it is enabled to retain and appropriate moisture, constitutes its main, if not its whole benefit. It may afford a stimulus to the roots of plants. Even the specific manures, that are supposed to supply organic matter to particular plants, may impart their benefits by their action upon the air and water. Facts are certainly at hand to show that the great and leading benefits of manures are in their control of moisture, and where that control is not needed, plants get a great growth on what we call poor soil. No manures, either fossil or putrescent, afford any considerable food for plants. Vegetation receives its growth mainly from water and from the atmosphere. Facts in support of this theory are abundant.

A trial was made to ascertain whence comes the matter of which a tree is composed. A quantity of kiln-dried earth was weighed and then put into a tight vessel. A willow shrub was also weighed and planted in that earth, and the vessel covered with perforated tin to keep out the dust; for a year and a half it was supplied only with pure water. The tree was then taken out, and found, by weight, to have gained one hundred and sixty pounds. The earth was then kiln-dried, as before, and weighed, and its weight was found to be only two ounces less than it was a year and a half before, when it was deposited there. The tree, then, must have received its growth, not from the soil, but from the water or the atmosphere, or both.

Another fact: take a load of manure, dry it thoroughly, and weigh it. Then moisten it and apply it to the soil, and it will increase the weight of vegetation from ten to thirty or forty times its own weight when dry, and yet most of that manure may still be found in the soil. Hence it can only feed plants in a very limited degree. Its action must be on air and water, or the control it gives the soil over those elements.

It is also matter of common observation that soil well manured, will continue moist for a long time after similar land by its side, but which has not been manured, is dried up. Hard coarse soils dry up very quickly, while soft, mellow, and friable ones will endure a long drought. The gases and moisture generated by the decomposition of manures produce this mellow state. Hence the necessity of having that decomposition take place under the soil, or of plowing in the manure.

Another important fact bearing on this question is, that what are regarded very poor soils, such as light sandy or gravelly land, will produce good crops in a season remarkable for the frequency of showers. On such soils crops are from twice to four times as large, in a wet season as in a dry, and yet there is an addition of nothing but moisture, and in such a manner, as not to have it stand and become stagnant among the roots of the plants.

Yet another evidence is in the strength of clay soils. A hard clay is very unproductive. But so disintegrated that plants can grow in it, it produces a great crop. This is because clay is of so close a texture, that when mixed with manure, turf, sand, or muck, although friable, it retains more moisture, than sand or ordinary loam. This is the reason of the superior fertility of land annually overflowed with water, as Egypt in the vicinity of the Nile. It is not that the Nile brings down deposits from the mountains of the Moon, so rich above all that is in the valleys below. The entire weight of all that a river deposits on ten acres would not equal in weight the increased vegetation of a single acre. The cause of the increased fertility is the fact that the deposit is so fine that it prevents rapid evaporation, and thus causes the soil to retain moisture for the large growth, and maturity of the plants.

One more evidence is found on our sandy pine plains. Our common forest-trees, as beech, maple, elm, or linden, will not flourish there. Such land will produce comparatively no corn, oats, or wheat. But rye that stands drought better than any other grain, grows tolerably well. But such plains always produce an enormous growth of pine timber, hardly equalled in the number of cords to the acre, by the heaviest-timbered land of the river bottoms. Why is this? Does a maple need so much more food than a pine, or is it in the habits of the trees? It is not in the richness or poverty of the soil, but in the adaptation of the trees to reach and appropriate moisture. The roots of the maple and beech, spread out near the surface of the ground. And it being a light, porous, sandy soil, it does not retain moisture enough to promote their growth. But whoever notices a pine-tree that has been turned up from the roots by the wind, will see that the roots run down almost perpendicularly ten or fifteen feet into the sand. There they find plenty of moisture and hence their great growth. This principle explains the comparative productiveness of all soils.

A soil composed of light muck, or a kind of peat-soil, will dry up soon. There

is nothing to prevent rapid evaporation; hence it is always unproductive, for want of suitable moisture. Mix with it clay, to render its texture more firm, and it will retain the moisture, and be very productive. Clay alone is too solid to retain moisture; it runs off, as from a brick. Mix sand with it, and it becomes mellow, and retains moisture, and produces great growth. Sand allows so free and rapid an evaporation that it is unproductive. We say it leaches and is hungry, and so it is, because it has little power to retain water. Our manures do it good, only as they are calculated to aid it in controlling moisture. If we apply a light manure as we would to clay, it is comparatively useless; it adds no firmness to the texture of the soil, and hence does not increase its capacity for controlling water. On such land, the only good that manure does, is while decomposition is taking place in the soil, it renders it more moist, and hence more productive. Apply clay to such a soil, and it will increase its firmness and consequent capacity of retaining and appropriating moisture, and thus render it highly valuable. Dry straw manure is sometimes said to dry up land, and ruin crops. So of turf in a dry season. In a wet season they greatly increase the growth of crops. Now they contain just as much food for plants in one season as another. Hence a soil too easily impervious to the atmosphere, will be a poor soil, that is, will produce poorly, simply because it has no power to retain the necessary moisture.

We suppose these facts and reasons to establish our theory, that the principal benefit of manures, and of mixing different soils, is in the control they give over the moisture and the atmosphere. Hence the greatly increased crop of clover from the application of three quarters of a bushel of plaster to an acre. The increased weight of clover on five square rods, would outweigh the plaster applied, and still that plaster remains, in almost its full weight, on the soil. This principle explains the benefit of mulching trees, plants, or vegetables. This is the best means of preserving trees, the first year after transplanting, and of securing a great growth, of any kind of shrubs or plants. This may be done with common straw or leaves. Now wherein is their utility? Not in the nourishment they afford the plants, but in the fact that mulching so covers the surface as to prevent rapid evaporation. In such cases, it is the more abundant moisture that secures the greater growth.

Hence the first study of a soil culturist should be to ascertain how he shall so mix and manage the materials at his command, as to cause them to retain moisture for the longest time, without leaving water to stand about the roots

of his plants. On this depends the whole importance of deep plowing and ditching. On this theory we may also account for the fact that certain plants prefer a certain kind of manure to all others. It is that those plants act in a certain manner on the soil requiring a specific action of manure to enable it to appropriate moisture and tax the atmosphere for their growth. This theory explains why too much manure is bad. Not because we give too much food to plants, but because excess of manure dries up the land. But whatever theory we adopt, we all agree in the utility of fertilizers. And the experience of practical farmers is of more value in aiding us to reach right conclusions, than all chemical essays on the subject that have ever been written.

MARL.

This is one of the best distributed and most universal fertilizers. Marl proper contains nearly equal proportions of clay and lime. Sand-marl is spoken of, in which sand and lime are the main ingredients. Clay-marls are to be applied to sandy and gravelly soils, and sand-marls to clayey soils. Shell-marls are very valuable, and seldom contain clay. Marls may easily be known, even by those not at all acquainted with chemistry. Apply any mineral acid, or even very strong vinegar, and if it be a marl, an effervescence will at once be observed: this effect is produced by acid upon lime.

MARJORUM.

There are two varieties in cultivation—the *sweet*, an annual herb; and the *winter*, a hardy perennial. They are grown and used as summer savory—used green, or dried for winter. They give a sweet, aromatic flavor to soups, stews, and dressings. The cultivation is, in all respects, like other garden-herbs of the kind, whether for medicinal or culinary purposes.

MELONS.

There are two species—musk and water melons—which are subdivided into many varieties of each. These are among the most delicious of all the products of the garden. A little use makes all persons very fond of them. The climate of the Middle and Southern states is well adapted to raising melons;

much better than the same latitudes in Europe. The following brief directions will insure success in their cultivation. A light, rich soil is always desirable. There should always be a little sand in the composition of soil for melons. If not there naturally, supply it; it will always pay. The warm sands of Long Island and New Jersey are the best possible for melons, especially for water-melons. It may be well to trench deep for the hills, and mix in a little well-rotted manure, and cover it with fine mould. A quantity of manure, left in bulk under the hills, will dry them up at the worst possible time. When you plant only a few in a garden, mulch your musk-melons with chips or sawdust from the wood-yard, or leaves and decayed wood from the forest, and you will get a great growth. They will grow luxuriantly in a pile of chips, with a little soil, in a door-yard, where hardly any other plant would flourish. The water-melon does best in almost pure sand, if it be enriched with liquid or some other of the finer manures. Plant musk-melons six feet apart, and water-melons nine feet each way. When the plants become established, never leave more than two or three in a hill. The product will be greatly increased in number and size, by picking off the end bud of the first runners when they show their blossom-buds; this causes them to throw out many strong lateral vines, which will produce abundantly. The attacks of striped bugs, so well known as the enemies of vines, and also of the black fleas, or hoppers (very minute, but quite destructive to tender vines when first up), may be prevented (says Downing) by sprinkling near the plants a little guano. As but a small portion of cultivators will have it, or can obtain it, we recommend to put many seeds in a hill, to provide for the depredations of the bugs, and sprinkle offensive articles around them. These will not always be effectual. We have recommended elsewhere to fence each hill, as the most effectual method. A box, with gauze or a pane of glass over the top, is a certain remedy in every case; it also greatly promotes the growth of the young vines. This is equally effectual against the cutworm and all other insects; and, as the boxes will last a dozen years or so, we should use them if we had ten acres of melons. But by early and late planting, and watchfulness, and replanting, you will succeed without protection. An excessive quantity of stable-manure does not increase the growth, especially of water-melons. Plaster, bonedust, and ashes, are good applications; hog-manure is the best of all. The seeds should be soaked two days, and planted an inch deep on broad hills, raised in the centre four inches above the level of the bed, that water may not stand around them; planted low, they sometimes perish in a few hours in a hot sun, after a rain.

Hoe them often, but never when they are wet, and never hoe near them after they have commenced running; the roots spread, about as much as the vines, and hoeing deep near them cuts off the roots, and materially injures them. Many a promising plat of melons has been ruined by stirring the soil when they were wet, and hoeing around them after they had begun to run. In walking among melons, great harm is done by stepping on the ends of vines. No one should be allowed among melons but the one who hoes or picks them. Many are lost by drought, after great care. We have often used an effectual remedy; it consists in turning up the vines, if they have begun to run before the drought, and putting around each hill from a peck to half a bushel of wet, well rotted manure; that from a spent hotbed is excellent for this purpose; and hoe from a distance between the hills, and cover the manure an inch or two deep with fine mould, lay down the vines, and saturate the hill with water, and they will hardly get dry again during the season. A little judicious watering will give you a great crop in the most severe drought.

Varieties of the Musk-melon.—These are numerous, and the nomenclature uncertain. The London Horticultural Society's catalogue enumerates seventy. Most of them are of no use to any one. Two or three of the best are sufficient. There are three general classes of musk-melons—the *green-fleshed*, as the citron and nutmeg; *yellow-fleshed*, as the cantelope, or long yellow; and *Persian melon*. The last is the finest of all, but is too tender for general cultivation with us, requiring much care and very warm seasons. The yellow-fleshed are very large, but much inferior in quality to either of the others. The green-fleshed are *the* musk-melons for this whole country. The nutmeg has long been celebrated; but, it being much smaller than the citron, and in no way superior in quality, we think the latter the best for all American gardens.

The following are enumerated in "White's Gardening for the South," as adapted to the latitude of the Southern states: *Christiana*, *Beechwood*, *Hoosainee*, *Sweet Ispahan*, *Pineapple*, *Cassabar*, *Netted Citron*, and *Rock*. These are doubtless all fine, and would do well at the North, with suitable care and protection. Downing's catalogue is nearly the same, with a very few additions.

Varieties of Water-melons—are also numerous, and names uncertain. The best varieties, however, are well known. The most choice are the following: *Imperial*, *Carolina*, *Black Spanish*, *Mountain-Sprout*, *Mountain-Sweet*,

Apple-seeded, and *Ice-cream*. The following excellent water-melons all originated in South Carolina: *Souter*; *Clarendon*, or *dark-speckled*; *Bradford*, very dark-green, with stripes mottled and streaked with green; *Ravenscroft*, and *Odell's large white*. There is a fine little melon, called the orange-melon, because the flesh and skin separate like an orange. These varieties will all do well with care. To preserve any one of them, it must be grown at some distance from other varieties. All water-melons should be far removed from citrons, which resemble them, raised only for preserving. They always ruin the next generation of water-melons. Different varieties of musk-melons planted together produce hybrids, partaking of the qualities of both, and are often very fine. We raised a cross between the yellow-fleshed cantelope and the nutmeg, which was excellent.

Seeds of most vines are better for being two or three years old, as they produce less vines, but more fruit. Melons are a luxury that should grow in every garden, and the state should enact severe laws against stealing them, making the punishment no less than fine and imprisonment.

MILLET.

This is a species of grain, partaking much of the nature of a large grass. Sowed thin, it produces a good yield. The seed is excellent for fowls. Ground, it is good for keeping or fattening all domestic animals. It is about equal to Indian corn for bread. Cut while green, but when nearly ripe, it is a good substitute for hay, producing a much larger quantity per acre. All animals prefer millet, cut in the milk, to hay. It is a less profitable crop for grain, on account of the irregularity of its ripening, and its extreme liability to shell, when dry. It must be cut as soon as the seed begins to harden. It also attracts swarms of birds, which are exceedingly fond of the seed. About three tons per acre is an average crop on tolerably good land. From one to three pecks of seed to the acre are sown broadcast. When sown in drills and cultivated, it grows very large, and requires only four quarts of seed per acre. It will make good fodder sown at any time from April to July. Its more extensive cultivation for fodder is recommended.

MINT.

This genus of plants comprises twenty-four species. Those usually cultivated in gardens are three, *Peppermint*, *Spearmint*, and *Pennyroyal mint*. All mints are propagated by the same methods. Parting the roots, offset young plants, and cuttings from the stalks. Spearmint and peppermint like a moist and even wet soil. Pennyroyal does better in a rich loam. Plants come into use the same season they are set. Set the plants eight inches apart, and on beds four feet wide, leaving a path two feet between them. In field culture, for the oils and essences, place them two feet apart, for the convenience of going between the rows with a horse. Thus cultivation becomes easy. They should be cut in full blossom, and dried in small bunches in the shade, but better by artificial heat, like hops. They should be cut when dry. For domestic uses, dry quickly, and pulverize, and put away in tight glass bottles. They will retain all their strength, keep free from dust, and always be ready for use. The same is true of all the herbs for domestic use. As a field crop, mints are profitable.

MULBERRY.

There are three varieties cultivated in this country. We place them in the order of their qualities:—

1. *The Johnson*.—A new variety, thus described by Kirtland: "Fruit very large; oblong cylindric; blackish, subacid, and of mild and agreeable flavor. Growth of wood strong."
2. *The Black Mulberry*.—An Asiatic variety, rather tender for the North, though it succeeds tolerably well in some parts of New England. Fruit large and delicious; tree low and spreading. Easily cultivated on almost any soil. Propagated by seeds, layers, cuttings, or roots.
3. *The Red Mulberry*.—A native of this country. Fruit small and pleasant, but inferior to the two preceding.

MULCHING.

This is placing around plants or trees, coarse manure or litter of any kind, to keep down weeds, and prevent too rapid evaporation of moisture. All straw, corn stalks, old weeds or stubble, forest leaves, seaweeds, old wood, sawdust,

old tanbark, chips, &c., are good for mulching. Any tree taken up and planted with reasonable care, and well mulched and watered, will live. One of fifty need not die. Cover the loose earth deep enough to prevent the springing of weeds. Put a little earth on the outer edge of the manure, leaving it dishing about the tree. Fill that occasionally with water, and you will get a good growth, even in a dry season.

Plant gooseberries or currants, and mulch the whole ground between the bushes, and give them no other cultivation, and the berries will grow nearly twice as large as the same varieties standing neglected, to grow up to weeds, in the usual way. Mulching with clean, dry straw, or with charcoal, is a preventive of mildew. It is the easiest method of taking care of strawberries after they are in blossom; the vines will bear much more and finer fruit, and it will be clean and neat. Mulching vines is a great means of insuring a crop. Every crop that can be mulched will be greatly benefited by it; hence, all the straw and litter that can be saved is money in the pocket; for mulching alone, it is worth five times as much as it can be sold for. Burning or in any way destroying cobs, cornstalks, stubble, old straw, or decaying wood, is extravagant wastefulness.

MUSHROOMS

Are vegetables growing up in old pastures, or on land mulched and the straw partly covered with soil. They are also cultivated in beds for the purpose. Picked at the right stage, they are a fine article of diet, almost equalling oysters. The use of the wild ones, however, is attended with some danger, for the want of knowledge of the varieties, or of the difference between the genuine mushroom, and the toadstools that so much resemble them.

Persons have been poisoned unto death by eating toadstools instead of mushrooms. When of middle size, mushrooms are distinguished by the fine pink or flesh color of their gills, and by their pleasant smell. In a more advanced stage, the gills become of a chocolate color; they are then apt to be confounded with injurious kinds. The toadstool that most resembles the true mushroom is slimy to the touch, and rather disagreeable to the smell. The noxious kind grows in the borders of woods, while the mushroom only grows in the open field. It is better, however, not to eat them unless gathered by a

practised hand, so as to be sure of no mistake. With the help of one accustomed to gathering them, you will learn in a few moments, so as to be accurate and safe.

Mushroom Beds.—Prepare a bed in the corner of the hothouse, or, in the absence of that, in a warm, dry cellar. The first of October is the best time. Make the bed four feet wide, and as long as you require. It should be one foot high perpendicularly at the edges, and sloping toward the middle; it should be of horse-manure, well forked, and put in compact and even, so as to settle all alike. Cover it with long straw, to preserve heat and the exhalations that would rise. At the end of ten days, the heat will be such as to allow you to remove the straw, and put an inch of good mould over the top of the bed. On this put the spawn or seed of the mushroom, in rows of six inches apart. The spawn are white fibres, found in old pastures, where mushrooms grow, or in old spent hotbeds, and sometimes under old stable floors. The warmth of the bed will produce mushrooms plentifully for a considerable time. If the production diminishes and nearly ceases, it may be renewed by removing the mould, and putting on good horse-manure to the depth of twelve inches, and covering and planting as before, and the production will be plentiful for a number of weeks.

MUSTARD.

There are two kinds cultivated, the black and the white, annuals, and natives of Great Britain. The white mustard is cultivated in this country principally for greens, and sometimes for a small salad like the cress. It may be sown at any time from opening of spring to the beginning of autumn. But sown in hot weather, the bed must be shaded. The Spaniards prefer the white mustard for grinding for table use, because of its mildness and its whiter flour. White mustard-seed, being much larger than the black, is preferred for mangoes, and all pickling purposes.

Black mustard is cultivated principally in the field, for the mills. It is there ground, and makes the well known condiment found on most tables.

Sow in March or April, broadcast on land tolerably free from weeds, and if you get it too thick, hoe up a part. In July or August, you may get a good crop. Cradle it as wheat, before ripe enough to shell.

Mustard used in various ways is medicinal. It is one of the safest and most speedy emetics. Stir up a table-spoonful of the flour and drink it. Follow it with repeated draughts of warm water, and in half an hour, you will have gone through all the stages of a thorough emetic, without having been weakened by it.

NASTURTIIUM.

This annual plant, found in most gardens, is too well known to need description. Were it not so common, its flowers, that appear in great profusion, from early summer till destroyed by frost, would be regarded very beautiful. Its main use is for pickles. Its green berries are nearly equal to capers for that purpose. It grows well on any good garden soil; bears more berries on less vines, planted on land not too rich. Single vines four feet apart, on rich land, do best.

NECTARINE.

This is only a fine variety of the peach, having a smooth skin. Downing gives instances of its return to the peach, and others of the production of nectarines and peaches on the same limb. The appearance of the tree is hardly distinguishable from the peach. It is one of the most beautiful of dessert fruits: it has no down on the skin, being entirely smooth and beautiful, like waxwork. Its smooth skin exposes it to the ravages of the curculio. It is longer-lived on plum-stocks, but is more generally budded on the peach. It is usually productive wherever peaches flourish, if not destroyed by the curculio. It is even more important than in the peach to head-in the trees often, to produce good large fruit.

Varieties—are divided into freestone and clingstone, with quite a number in each class. We give only a few of those most esteemed.

Boston.—Freestone, American seedling; hardy and productive; color deep-yellow, with a bright-red cheek. Time, September 1st.

Due du Telliers.—Freestone, pale-green, with a marbled reddish cheek; flesh whitish, inclining to green; very fine; a great bearer of rather large fruit.

Time, last of August.

Hunt's Tawny.—Very fine and early; a great bearer; tree hardy; color, pale-orange, with a dark-red cheek, with many russety specks. Time, forepart of August.

Pitmaston Orange.—A fine yellow nectarine, maturing the last of August.

The Early Violet—is an old French variety, everywhere esteemed; it has sixteen synonyms; fruit high-flavored. Time, last of August.

Newington.—A good clingstone; an English variety that has long been cultivated; it has many synonyms; the color dark-red when exposed. Time, 10th of September.

Newington Early—Is one of the best, earlier, larger, and better, than the preceding; ripens first of September. The same varieties are excellent for the South, where they ripen considerably earlier. The following selection of choice, hardy nectarines for a small garden, is from Downing:—

Early Violet, Elruge, Hardwicke Seedling, Hunt's Tawny, Boston, Roman, and New White.

NEW FRUITS.

That these are constantly appearing, is a matter of common observation; but the manner of their production has given rise to much diversity of opinion. The theory that they are the results of replanting, from the seeds of successive generations of the same tree, is called the Van Mons' theory, after Dr. Van Mons, of Belgium, who devoted many years of close study and application to the improvement of fruit, especially of pears, by this method. His directions may be briefly summed up as follows. Plant seeds from any good variety of fruit; let those seedlings stand without grafting, until they bear. Take the first fruit from the best of those seedlings, and plant it and produce other seedlings, and so on. The peach and plum are said to reach a high state of excellence in the third generation, while the pear requires the fifth. Seeds from old trees are said to have a great tendency to return to their wild origin, while those of young, improving trees will more generally produce a better fruit. The seeds from a graft from a young tree does not produce a better than

itself. The succession must be of seedlings. This theory requires long practice, and is exposed to interruptions by the crosses that will necessarily occur between different trees in blossom. And we have in so many cases had a fruit of great perfection arise from a single planting of seed from some known variety, that we must conclude the improvement to be produced by some other principle than that of the Van Mons' theory. The evidence is in favor of the opinion that new varieties of fruit arise from cross-fertilization in the blossoms of different kinds, and that the improvement of the qualities of any given variety is the result of cultivation. Some of the best plums we have are known to have been the product of fertilizing the blossoms of one tree from the pollen of another; this is constantly taking place with our fruits, and is consequent upon our mixed orchards. Let this be attended to artificially, by covering branches with gauze, to prevent the fertilization by bees and winds, and make the cross between any two varieties you choose, and the results may prove highly beneficial. The amateur cultivator may render essential service to pomology by this practice. We know that all our choice fruits have come from those not fit for use. It is not improved cultivation of the old, barely, but the production of new varieties. The subject of further improvement, therefore, demands careful study and practice. The seeds of established varieties, planted at once without drying, will often reproduce the same. We are not certain but they generally would, if not affected by blossoms of contiguous trees.

NURSERY.

Of this subject we can only give the general outlines. This department of soil-culture is so distinct, that the few who engage in it as a business are expected to make it an especial study. In a work like this, it is only desirable to give those general principles that will enable the cultivator of the soil to raise such trees as he may desire on his own premises. These directions may be considered reliable, and, as far as they go, are applicable to all nurseries.

Location.—This is the first point demanding attention. If a piece of land containing a variety of soils can be selected, it will prove beneficial, as different trees require different soils for their greatest perfection. A situation through which a rivulet may run, or in which a pond may be constructed, fed by a spring or hydrant, is of great value for watering. The situation of the

nursery, as it respects shade or exposure, is also important. Trees should generally be as much exposed to the elements, in the nursery, as they will be when transplanted in the orchard. Trees removed from shaded situations to the open field will be stunted in growth for some time, and may be permanently injured. Never allow your nursery to be shaded by large trees. Bearing trees, designed to show the quality of your fruit, should occupy a place by themselves.

Soil.—A theory that has had many adherents is that trees raised on poorer and harder land than that they will occupy in the orchard, will grow more vigorously, and do better, than those transplanted from better to worse soil. Thus, trees have often been preferred from high, hard hills, to transplant in good loam or alluvium. On the same principle, a calf or colt should be more healthy, and make a better creature, for having been nearly starved for the first year or two. Neither of these is true. Give fruit-trees as great a growth as possible while young, without producing too tender and spongy wood for cold winters. It is only desirable to check the early growth of fruit-trees on the rich prairies of the West, and that should be done, not by the poverty of the soil, but by root-pruning or heading-in; this prevents a spongy, tender growth, that is apt to be injured by their trying winds. Trees that are brought from a colder to a warmer region, always do better.

Preparation of the Soil.—It should be made quite rich with stable-manure, lime, and wood-ashes, and cultivated in a root-crop the previous year—any roots except potatoes. Those left in the ground will come up so early and vigorous in the spring, that you can not eradicate them without destroying many of your young seedlings. The land should be worked very deep by subsoiling, or better with double-plowing, by which the manure and top-soil are put in the bottom. As manure always works up, the effect will be excellent. Buckwheat is good to precede a nursery; it shades the ground so densely as to protect it from the scorching sun, and effectually destroy all weeds. Trees planted on land prepared by double-plowing (see our article on "Plowing") will make one third greater growth, in a given time, than those on land prepared in the ordinary way. In double-plowing, if the subsoil be very poor, it will be necessary to give a top-dressing of well-rotted manure, worked in with a cultivator. Thorough draining is also very essential to a nursery.

Time of Planting.—The general practice is to plant in the fall, at any time before the ground freezes. The better way is to keep seeds in moist sand, or dry and spread thin, until spring, and plant as early as the ground will allow. Freezing apple-seeds is of no use. Hard-shelled seeds had better be frozen, to open the stones and give them an opportunity to germinate. The advantage of spring-planting is, the ground can be put in much better condition, and the seeds will start quite as early as the weeds, and much labor may be saved in tending.

Method of Planting.—Plant with a drill that will run about an inch deep, putting the seeds in straight rows, not more than an inch wide, and two and a half feet apart; this will allow the use of a small horse and cultivator, which will destroy nearly all the weeds. Use a potato-fork or hoe, across the rows, among the seedlings, and very little weeding will be necessary. It is not more than one fourth of the ordinary work to keep a nursery clean in this way. Two thirds of those thus planted and cultivated will be large enough for root-grafting the first season, and for cleft-grafting the second. When your seedlings are six inches high, if you thoroughly mulch them with fine straw or manure, you will be troubled with no more weeds, and your trees will get a strong growth.

For root-grafting, pull up those of suitable size very late in the fall, cut off the tops eight inches from the root, and pack in boxes, in moist sand, and keep in a cellar that does not freeze; graft in winter, and repack them in the boxes with moist sand, sawdust, or moss, and keep them until time to transplant in spring. They should not be wet, but only slightly moist. In the spring, plant them in rows three feet apart, and ten inches in the row. The second year, if they are not wanted in market, they should be taken up and reset, in rows four feet apart, and two feet in the row. Cut off the ends of large roots, to encourage the growth of numerous fibrous roots. Large nursery-trees, that have not been transplanted, are of little value for the orchard, being nearly destitute of fibrous roots. But large trees, even of bearing size, when transplanted in the orchard, do quite as well as small ones, provided they have been several times transplanted in the nursery. This produces many fibrous roots, upon which the health and life of the tree depend.

In many regions, great care must be taken to prevent destruction of young trees by snow-drifts. This is done by selecting locations, and by constructing

or removing fences, to allow the snow to blow off; treading it down as it falls is also very useful, both in protecting the trees from breaking down by the settling of drifts in a thaw, and from the depredations of mice under the snow.

Trees should be taken up from the nursery with the least possible injury to the roots. Do not leave them exposed to the air for an hour, not even in a cloudy day. It is an easy matter to cover the roots with mats, straw, or earth. Protect also from frosts; many trees are ruined by exposure to air and frost, of which the nurseryman is very careful in all other respects. For transportation, they should be closely packed in moist straw, and wound in straw or mats, firmly tied and kept moist. Trees, cared for and packed in this way, may be transported thousands of miles, and kept for two months, without injury.

NUTS.

More attention to the cultivation of nuts, would add materially to our domestic luxuries. There are so many nuts in market, that are the spontaneous productions of other countries, or raised where labor is cheap, that we can not afford to raise them as an article of commerce. But a few trees of the various kinds, would be a great addition to every country residence. We could always be certain that our nuts were fresh and good. A small piece of ground devoted to nuts, and occupied by fowls, would be pleasant and profitable. English walnuts do well here. We have varieties of hickory nuts, native in this country, which, to our taste, are not surpassed by any other. Chestnuts are easily grown here (see our directions elsewhere in this volume). Butternuts, filberts, peanuts (growing in the ground like potatoes), and even our little forest beechnuts, are easily raised.

The dwarf chestnut of the Middle and Southern states is decidedly ornamental in a fruit garden. Its qualities are in all respects like the common chestnut, only the fruit is but half the size, and the tree grows from five to ten feet high. In all our landscape gardens, and in all places where we retain forest trees for ornamental purposes, it is better to cultivate trees that will bear good nuts. The varieties of nut-bearing trees, interspersed with evergreens, make a beautiful appearance.

OAKS.

Raising oak-timber, on a large scale, will soon be demanded in this country. In some sections we have immense quantities of native oaks; but they are fast disappearing, and the present expense of transporting the timber, to places where it is needed, is much greater than would be the cost of raising it. A million of acres of oaks ought to be planted within the next five years. A crop of white oak, of only twenty-five years' growth, would be very valuable; and twenty-five or fifty acres, of forty years' growth, would be worth a handsome fortune, especially in the West. On all the bluffs in the West they grow well, and on the prairies they will do even better, after they have been cultivated a few years. The application of a little common salt on rich alluvial soils, is a great advantage in growing timber.

Preserve acorns in moist sand during winter, and plant in the spring, in rows six feet apart, to give opportunity for other crops among them for a year or two, to encourage good cultivation. Plant a foot apart in the row, that, in thinning out, good straight trees may be left; at three or four years old, thin to four feet in the rows; afterward, only remove as appears absolutely necessary. Trim straight and smooth. The question of transplanting is important. Shall we plant thick, as in a nursery, and then transplant, or shall we plant where they are to grow? In fruit-trees, the object is to get a low, full, and spreading top, of horizontal branches, that will bear much fruit. This is eminently promoted by transplanting, root-pruning, and heading-in. But in raising timber, the object is to get trees of long, straight bodies, with the fewest possible low branches. Such are the native trees of the forest. This is best promoted by planting thick, never transplanting, and keeping all the lower limbs well trimmed off. These directions are for raising timber on good tillable land. Such groves may be good for pastures, and for poultry-yards, for a long time. Beside this, we have large areas of rough land, that will not soon be brought into cultivation for other purposes. Fine timber may be grown on such land, with no care but trimming.

OATS.

This is one of the great staple agricultural products of all regions, sufficiently moist and cool for their successful growth. Oatmeal makes the most wholesome bread ever eaten by man. For all horses, except those having the heaves, oats are the best grain; to such horses they should never be fed—

corn, soaked or ground, is best. They are valuable for all domestic animals and fowls.

Varieties.—These are numerous. Those called side-oats yield the largest crops: but of these there are several varieties. The genuine *Siberian* oats are tall, heavy, dark-colored side-oats, the most productive of any known. *Swedish* oats, and other new varieties, are coming into notice; most of these are the *Siberian*, under other names, and perhaps slightly modified by location and culture. The barley-oats, Scotch oats, and those usually cultivated, will yield only about two thirds as much per acre as the true *Siberian*; the same difference is apparent in the growth of straw. Oats will produce something on poor land, with bad tillage, but repay thorough fertilization and tillage as well as most other crops. Enrich the land, work it deep and thoroughly, and roll after harrowing. Moist, cool situations are much preferable for oats: hence, success in warm climates depends upon very early sowing. Oats sowed as late as the first of July, in latitude forty-two and further north, will mature; yet, all late oats, even with large straw and handsome heads, will be found to be only from one half to two thirds filled in proportion to the lateness of sowing. The entire *profits* of an oat-crop depend upon *early sowing*.

Harvest as soon as the grain begins to harden, and the straw to turn yellow. Allowed to get quite ripe, they shell badly, and the straw becomes useless, except for manure. Cut with reaper or cradle, and bind: all grain so cut is more easily handled, thrashed, and fed. Mow no grain that is not so lodged down that a cradle or reaper can not be used. The straw of oats cut quite green is nearly as good as hay.

OKRA.

A valuable garden plant, easily propagated by seeds. It is excellent in cookery, as a sauce. Its ripe seeds, used as coffee, very much resemble the genuine article. The green pods are much used in the West Indies, in soups and pickles. Plant at the usual time of corn-planting, in rows four feet apart, two or three seeds in a place, eight inches apart in the row; leave but one in a place after they get a few inches high, and hoe as peas, and the crop will be abundant.

OLIVES.

These are natives of Asia, but have, beyond date, been extensively cultivated in Southern Europe. Olive-oil is an important article of commerce in most countries. Its use in all kinds of cookery, in countries where it flourishes, renders olives as important, to the mass of the people, as cows are in New England. It should be a staple product of the Southern states, to which it is eminently adapted. It is hardy further north than the orange. With protection, it may be cultivated, with the orange and lemon, all over the country. Olive-trees attain a greater age than any other fruit-tree. An Italian olive-plantation, near Terni, is believed to have stood since the days of Pliny. Once set out, the trees require very little attention, and they flourish well on the most rocky lands, that are utterly useless for any other purpose. Calcareous soils are most favorable to their growth. They are propagated by suckers, seeds, or by little eggs that grow on the main stalk, and are easily detached by a knife, and planted as potatoes or corn. Olives will bear at four or five years from the seed; they bear with great regularity, and yield fifteen or twenty pounds of oil per annum to each tree. There are several varieties. Plantations now growing at the South are very promising.

ONIONS.

Of this well-known garden vegetable there are quite a number of varieties.

1. *The Large Red*.—One of the most valuable.
2. *The Yellow*.—Large and profitable, keeping better than any other.
3. *The Silver-skin*.—The handsomest variety, excellent for pickling, brings the highest price of all, but is not quite so good a keeper as the red or yellow, and does not yield as well.
4. *The White Portugal*.—A larger white onion, often taken for the true silver-skin. It is a good variety. The preceding are all raised from the black seed, growing on the top.
5. *The Egg Onion*.—So called from its size and shape. On good rich soil, the average size may be that of a goose-egg, which it resembles in form. It is of a

pale-red color, and more mild in flavor than any other. They are usually raised by sowing the black seed, very thick, to form sets for next year. Those sets, put out early, will form large onions for early market, that will sell more readily than any other offered.

6. *The Top Onion*.—So called because the seed consists of small onions, growing on the top of the stalks, in place of the black seed of other onions. These are good for early use, grow large, but are poor keepers.

7. *The Hill or Potato Onion*.—Of these there are several kinds, most of which are unworthy of cultivation. The *Large English* is the only valuable variety. The small onions, for sets, grow in the ground from the same roots, by the side of the main onion. Some of these grow large enough for cooking. The main onion is the earliest known, grows large, and has a mild, pleasant flavor;—they will mature at a certain season, whatever time you plant them; hence, they must be planted very early to produce a good crop. We have planted them on good ground so late as to get little more than the seed. They are fine for summer and fall use, but keep poorly. The foregoing are all that are necessary. They can all be brought forward by early planting of sets raised the previous season, by sowing the black seed so thick that they can not grow larger than peas, or small cherries.

Good sandy loam and black muck are the best soils for onions. Any good garden soil may be made to produce large crops; good, well rotted stable-manure and leached ashes are the best. The theory of shallow plowing, and treading down onion-beds is incorrect. The roots of onions are numerous and long. The land should be well-manured, double-plowed, and thoroughly pulverized. The only objection to a very mellow onion-bed is the difficulty of getting the seed up: this is obviated by rolling after sowing, which packs the mould around the seed, so as to retain moisture and insure vegetation. Fine manure, mixed in the surface of the soil for onions, is highly beneficial; on no other crop does manure on the surface do so much good. Mulching the whole bed, as soon as the plants are large enough, is in the highest degree beneficial, both in promoting growth, and keeping down weeds. An onion-bed must be made very smooth and level, to favor very early hoeing, without destroying the small plants. All root-crops that come up small, are tended with less than half the expense, if the surface be made very smooth and level. Never divide your onion-ground into small beds, but sow the longest way, in straight

narrow rows, eighteen inches apart, for convenience of weeding and hoeing. Cultivate while very young, and work the soil toward the rows, so as to hill up the plants; this should be removed after they begin to form large bulbs. Breaking down the tops to induce them to bottom, is a fallacy: it will lessen the crop. Rich soil, deep plowing, thorough pulverizing, early sowing, and frequent hoeings, will insure success. Our system of double-plowing is the best for this crop. They will do equally well, some say improve, for twenty years on the same bed. Work the tops into the soil where the plants grow. Let the rows be very narrow and very straight, and you will save half the ordinary expense of cultivation.

To gather and preserve well, you should house them when very dry. A day's exposure to a warm autumn sun is very beneficial. Keep them in an open barn or shed until there is danger of frost. A warm, damp cellar always ruins them; keep them through winter in the coolest dry place possible, without severe freezing. Once freezing is not injurious, but frequent freezing and thawing ruins them. They are very finely preserved braided into strings and hung in a cool, dry room.

ORANGES.

This name covers a variety of species of the same general habits. It flourishes well on the coast of Florida, and all along the gulf of Mexico. It will stand considerable freezing, if protected from sudden thawing. In southern Europe, they are grown abundantly by being protected by a shed of boards. They may become perfectly hardy, as far north as Philadelphia. And by a thorough system of acclimation, and a little winter protection, they may be grown abundantly, in every state of the Union. The great enemy of the orange-tree is the scaled insect. It has been very destructive in Florida. A certain remedy is said to have been discovered in the *camomile*. Cultivate the plant under orange-trees, and it will prevent their attacks. The herb hung up in the trees, or the tree and foliage syringed with a decoction of it, will effectually destroy these insects. The orange is long-lived. A tree called "The Grand Bourbon" at Versailles was planted in 1421, and now, being 437 years old, is "one of the largest and finest trees in France." There are several varieties mentioned in the fruit books. The common Sweet Orange, the Maltese, the Blood Red—very fine with red flesh. The Mandarin Orange, an excellent little fruit from

China. The St. Michael's is described as the finest of all oranges, and the tree the best bearer. Oranges are propagated by budding, and cultivated much in the same way as the peach.

ORCHARDS.

An orchard is a plat of ground, large or small, occupied by trees for the purpose of bearing fruit. The main directions for orchard culture, are given under the respective fruits. Any soil good for vegetables or grains, is suitable for orchards. Any land where excessive moisture will not stand, to the injury of the trees, may be adapted to any of the fruits. Set pears on the heaviest land, peaches on the lightest, and the other fruits on the intermediate qualities. Although peaches will do quite well on light soil, yet they do better on a rich deep loam, or alluvium. When it is desirable to set out an orchard on land originally too wet, a blind ditch must pass under each row, extending out of the orchard, and the place where each tree is to stand, should be raised a foot above the level around it.

The aspect is also important. A southern or eastern exposure is preferable, in all latitudes where the transitions from summer to winter, and from winter to summer are so sudden as to allow but little alternate thawing and freezing. This would therefore be the rule in high latitudes. In climates of long changeable springs, a northern or western exposure is better. Trees may be made to start and blossom later in the spring by snow and ice about them, well pressed down in winter, and covered with straw. This will prevent the first warm weather from starting the leaves and blossoms, and cause them to be a little later, but surer and better.

Subsoiling ground for an orchard, is of great importance. Plant two orchards, one on land that has been subsoiled very deep, and the other upon that plowed in the ordinary way, and for ten years the difference will be discernable, as far as you can distinguish the trees in the two orchards.

Manures of all kinds, are good for orchards, except coarse stable manure, which should be composted. A bushel of fine charcoal, thoroughly mixed in the soil in which you set a fruit-tree, will exert a very beneficial influence, for a dozen years.

Orchards should be cultivated every alternate three successive years, and the rest of the time be kept in grass. Just about the trees, the ground should be kept loose, and free from weeds and grass. This may be done by spading and hoeing, but better by thorough mulching.

Distances apart.—Apples thirty-three feet. Pears twenty feet. Peaches and plums, sixteen feet. Pruning, destroying insects, and all other matters bearing on successful fruit growing, are treated under the several fruits.

OXEN.

Every farmer who can afford to keep two teams, should have a pair of oxen. For many uses on a farm, they are preferable to horses; especially for clearing up new land. Oxen to be most valuable, should be large, well matched, ruly, and not very fat. They should be kept in good heart, by the quality of their food. Fast walking is one of the best qualities in both horses and oxen, for all working purposes, provided they are judiciously used and not overloaded. Well built, strong animals are best for work. Working oxen should be turned out for beef, at eight or nine years old.

To break oxen well, commence when they are very young. Put calves into yokes frequently, until they will readily yield to your wishes. Yoke them often, and tie their tails together to prevent them from turning the yoke and injuring themselves. If left without training, until they are three or four years old, they will improve every opportunity to run away, to the danger and damage of proprietor and driver. It is quite an art to learn oxen to back a load. Place them before a vehicle, in a locality descending in the rear. As it rolls down hill, they will easily learn to follow, backward. Then try them on level ground. Then accustom them to back up hill, and finally to back a load, almost as heavy as they can draw.

Breaking vicious animals is always best done by gentleness. We have known vicious horses whipped severely, and in every way treated harshly, and finally given up as useless. We have seen those same horses, in other hands, brought to be regular, gentle, and safe, as could be desired, by mild means, without a blow or harsh word. Oxen should be driven in a low tone of voice, and without much use of the goad. The usual manner of driving, by whipping and bawling, to the annoyance of the whole neighborhood, and until the

driver becomes hoarse with his perpetual screams, is one of the most pernicious habits on a farm. Oxen will grow lazy and insensible under threat, or scream, or goad. Driven in a low tone of voice, without confusion by rapid commands, and no whoa put in, unless you wish them to stand still, oxen may be made more useful on a farm than horses. Their gears are cheap and never in the way. They can draw more and in worse places than horses, and it costs less to keep them. The various methods of drawing with head or horns, in vogue in other countries, need not be discussed here, as the American people will not probably change their yoke and bows for any other method.

Feed oxen, as other animals, regularly, both in time and quantity. Curry them often and thoroughly. It improves their looks, health, and temper, and attaches them to their owner.

PARSLEY.

This is a hardy biennial, highly prized as a garnish, and as a pot-herb for flavoring soups and boiled dishes. The large-rooted variety is used for the table, as carrots or parsnips. The principal varieties are—the *double-curved*, the *dwarf-curved*, the *Siberian* (single, very hardy, and fine-flavored), the *Hamburgh* (large-rooted, used as an edible root). The double-curved is well known, easily obtained, and suitable for all purposes. Those who desire the roots instead of parsnips, &c., should cultivate the Hamburgh or large-rooted. It needs the same treatment as beets. Seed should always be of the previous year's growth, or it may not vegetate. It is four or five weeks in coming up, unless it be soaked twelve hours in a little sulphur-water, when it will vegetate in two weeks. By cutting the leaves close, even, and regular, a succession of fine leaves may be had for a whole year from the same plants, when they will go to seed, and new ones should take their place. In cold climates they should be covered in winter with straw or litter. The Siberian is cultivated in the field, sown with grass or the small grains. It is said to prevent the disease called "*the rot*" in sheep, and is good for surfeited horses. The large-rooted should not be sowed in an excessively rich soil, as it produces an undue proportion of tops.

PARSNIPS.

English authors speak of but one variety of this root in cultivation in England. The French have three—the *Coquaine*, the *Lisbonaise*, and the *Siam*. The first runs down, in rich mellow soil, to the depth of four feet, and grows from six to sixteen inches in circumference; the *Lisbonaise* is shorter and larger round; the *Siam* is smaller than the others, of a yellowish color, and of excellent quality. We are not aware that our little hollow-crown carrot, so early and good, is included in the French varieties. We cultivate only the hollow-crown, and a common large variety; both are good for the table, and as food for animals. They need a light, deep, rich soil. A sandy loam is best, as for all roots. Seed kept over one season seldom vegetates. Should be soaked a day or two, and sown in straight rows, covered an inch deep, and the rows slightly rolled. It is much better, with this and the carrot, to sow radish-seed in the same rows. They come up so soon that they protect the parsnips and carrots from too hot a sun while tender, and also serve to mark the rows, so that they may be hoed early, without danger of destroying the young plants. Parsnips may be grown many years on the same bed without deterioration, provided a little decomposed manure or compost be annually added. Fresh manure is good if it be buried a foot deep. The yield will be greater if thinned to eight inches apart. Rows two feet apart, and the plants six inches in the row, are most suitable in field-culture. They will grow till frost comes, and are better for the table, when allowed to stand in the ground through the winter. They may be dug and preserved as other roots. Parsnips contain more sugar than any other edible root, and are therefore worth more per bushel for food. All domestic animals and fowls fatten on them very rapidly, and their flesh is peculiarly pleasant. Fed to cows, they increase the quantity of milk, and impart a beautiful color and agreeable flavor to the butter. It is superior to the beet, that we have so highly recommended elsewhere, in all respects except one—it is less easily tended and harvested. Still, they should be cultivated on every farm where cattle, hogs, or fowls, are kept.

PASTURES.

These are very important to all who keep domestic animals. The following brief directions for successful pasturing are essential. It is very poor economy to have all your pasture-lands in one field, or to put all your animals together. Pasture fields in rotation, two weeks each, allowing rest and growth for six

weeks: first horned cattle, next horses, then sheep. Horses feed closer than cattle, and sheep closer than horses; each also eats something that the others do not relish. Pasturing land with sheep thickens the grass on the ground. For the kinds of grass preferable for pastures, see our article on *Grasses*. Plaster sown on pastures containing clover, materially increases their growth. A little lime, plaster, and common salt, sown on any pasture, will prove very beneficial. Streams or springs in pastures double their value. The idea that creatures need no water when feeding on green grass is a mistake. Every pasture without a spring or stream should have a well. Cattle in a pasture in warm weather need shade. It is usual to advise the growth of trees in the borders, or scattered over the whole field. Sheds are much better. Trees absorb the moisture, stint the growth of the grass, and injure its quality. A pasture containing many trees is not worth more than half price; it will keep about half as much stock, and keep them poorly. Bushes, which so often occupy pastures, should be grubbed up, and by all means destroyed; so should all thistles, briars, and large weeds. Hogs and geese should be kept in no pastures but their own. Never turn into pastures when the ground is very soft and wet, in the spring; the tread of the creatures will destroy much of the turf. Creatures in pasture should be salted twice a week. The age of grass, to make the best feed for animals, is often mistaken: most suppose that young and tender grass is preferable; this is far from correct. Grass that is headed out, and in which the seed has begun to mature, is far more nutritious, as every farmer can ascertain by easy experiments. Tall grass, approaching maturity, will fatten cattle much faster than the most tender young growth. Pasturing land enriches it. It is well to mow pastures and pasture meadows occasionally, though few meadows and pastures should lie long without plowing. Top-dressings of manure, on all grass-lands, are valuable; better applied in the fall than in the spring; evaporation is less, and it has opportunity to soak into the soil.

PEAS.

These are sown in the field and garden. As a field-crop, peas and oats are sown together, and make good ground or soaked feed for horses, or for fattening animals. Early peas and large marrowfats are frequently sown broadcast on rich, clean land, near large cities, to produce green peas for market. It does not pay as well as to sow in rows three feet apart, and

cultivate with a horse. All peas, for picking while green, are more convenient when bushed. They may produce nearly as well when allowed to grow in the natural way, but can not be picked as easily, and the second crop is less, and inferior, from the injury to the vines by the first picking. Early Kent peas (the best early variety) mature so nearly at the same time that the vines may be pulled up at once. All other peas had better be bushed, that they may be easily picked, and that the later ones may mature. Bushes need not be set so close as usual. A good bush, put firmly in the ground, to enable it to resist the wind, once in two and a half feet, is quite sufficient. Those clinging to the bushes will hold up the others. To bush peas in this way is but little work, and pays well. It is often said that stable-manure does no good on pea-ground—that peas are neither better nor more abundant for its use. We think this utterly a mistake. We have often raised twice the quantity on a row well manured, that grew on another row by its side, where no manure had been applied. If peas be sowed thick on thoroughly-manured land, the crop will be small: it is from this fact that the idea has gained currency. They are generally planted too thick on rich land. Peas planted six inches deep will produce nearly twice as much as those covered but an inch. Plowing in peas and leveling the surface is one of the best methods of planting. To get an early crop in a cold climate, they may be forced in hotbeds, or planted in a warm exposure, very early, and protected by covering, when the weather is cold. At the South, it is best to plant so as to secure a considerable growth in the fall, and protect by covering with straw during cold weather.

The only known remedy for the bugs that are so common in peas, is late sowing. In latitude forty-two, peas sown as late as the 10th of June will have no bugs. Bugs in seed-peas may be killed by putting the peas into hot water for a quarter of a minute; plant immediately, and they will come up sooner and do well. Seed imported from the more northern parts of Canada have no bugs; it is probably owing to the lateness of the season of their growth. But late peas are often much injured by mildew; this is supposed to be caused by too little moisture in the ground, and too much and too cool in the atmosphere, in dew or rain. Liberal watering then would prevent it.

Varieties—are numerous. Two are quite sufficient. *Early Kent* the earliest we have ever been able to obtain, ripen nearly all at once; moderate bearers, but of the very best quality. This variety of pea is the only garden vegetable with which we are acquainted that produces more and better fruit for being sowed quite thick. The other variety that we recommend is the *large Marrowfat*. These should not stand nearer together, on rich land, than three or four inches, and always be bushed. There are many other varieties of both late and early peas, but we regard them inferior to these. White's "Gardening for the South" mentions Landreth's Extra Early, Prince Albert, Cedo-Nulli, Fairbank's Champion, Knight's tall Marrow, and New Mammoth. Whoever wishes a greater variety can get any of these under new names. The large blue Imperial is a rich pea, like many of the dwarfs, both of the large and small, but is very unproductive. We advise all to select the best they can find, and plant but two kinds, late and early.

Plant at intervals to get a succession of crops. But very late peas, in our dry climate, amount to but little, without almost daily watering.

PEACH.

This native of Persia is one of the most healthy and universally-favorite fruits. In its native state, it was hardly suitable for eating, resembling an almond more than our present fine peaches. Perhaps no other fruit exhibits so wide a difference in the products of seeds from the same tree. All the fine varieties are what we call chance products of seeds, not one out of a thousand of which deserved further cultivation. The prevailing opinion is, that planting the seeds is not a certain method of propagating a given variety; hence the

general practice of budding (which see). Others assert that there are permanent varieties, that usually produce the same from the seed, when not allowed to mix in the blossoms. Some prefer to raise the trees for their peach-orchards from seed, thinking them longer-lived and more healthy. Whole peaches planted when taken from the tree, or the pits planted before having become dry, are said to be much more certain to produce the same fruit. We know an instance in which the fruit of an early Crawford peach, thus planted, could not be distinguished from those that grew on a budded tree in the same orchard. One of the difficulties in reproducing the same from seed, is the great difficulty in getting the seed of any variety pure. We everywhere have so many varieties of fruit-trees in the same orchard, that the seeds of no one can be pure; they mix in the blossoms. On this account, the surest method of perpetuating a variety is by budding. This tree is of rapid growth, often bearing the third year from the seed, and producing abundantly the fifth. The peach-tree is often called thrifty when its growth is very luxuriant, but tender and unhealthy, perishing in the following winter. A moderate, steady, hardy growth is most profitable. The following directions, though brief, are complete:—

Raising Seedlings.—Dry the pits in the shade; put them away till the last of winter; then soak them two days in water, and spread them on some place in the garden where water will not stand, and cover them an inch deep with wet sand, and leave them to freeze. When about time to plant them (which is early corn-planting time), take them up and select all those that are opened by the frost, and that are beginning to germinate, and plant in rows four feet apart and one foot in the row. These will grow and be ready for budding considerably earlier than those not opened by frost. Crack the others on a wooden block, by striking their side-edge with a hammer; you thus avoid injury to the germ that is endangered by striking the end. Plant these in rows like the others, but only six inches apart in the row, as they will not all germinate. Plant them on rich soil covering an inch or two deep. Keep them clear of weeds, and they will be ready for budding from August 15th to September 10th, according to latitude or season. In a dry season, when everything matures early, budding must not be deferred as long as in a wet season.

For full directions for budding, see our article on that subject.

Transplanting.—Perhaps no other fruit-tree suffers so much from transplanting when too large. This should always be done, after one year's growth, from the bud. The best time for transplanting is the spring in northern latitudes subject to hard frosts, and in autumn in warmer climates.

Soil and Location.—All intelligent fruit-growers are aware that these exert a great influence upon the size, quality, and quantity, of all varieties of fruits. An accurate description of a variety in one climate will not always identify it in another. Some few varieties are nearly permanent and universal, but most are adapted to particular localities, and need a process of acclimation to adapt them to other soils and situations. Light sandy soils are usually regarded best for the peach: it is only so because nineteen out of twenty cultivators will not take pains to suitably prepare other soils. Some of the best peaches we have ever seen grew on the richest Illinois prairie, and others on the limestone bluffs of the Ohio river. Thorough drainage is indispensable for the peach, on all but very light, porous soils: with such drainage, peaches will do best on soil best adapted to growing corn and potatoes. Bones, bonedust, lime, ashes, stable-manure, and charcoal, are the best applications to the soil of a peach-orchard. Whoever grows peaches should put at least half a bushel of fine charcoal in the earth in which he sets each tree. Mix it well with the soil, and the tree will grow better, and the fruit be larger and finer, for a dozen years. Any good soil, well drained and manured with these articles, will produce great crops of peaches. For the location of peach-orchards, see our general remarks on "Location of Fruit-trees." But we would repeat here the direction to choose a northern exposure, in climates subject to late frosts. Elevations are always favorable, as are also the shores of all bodies of water. In our remarks on location, we have shown by facts the great value of hills, so high as to be useless for any other purpose. Between Pittsburgh and the mouth of the Ohio river, there are enough high elevations, now useless, to supply all the cities within fifty miles of the rivers, down to New Orleans, with the best of peaches every year. In no year will they ever be cut off by frost on those hills. Warm exposures, with a little winter protection, will secure good peaches in climates not adapted to them. In some parts of France, they grow large quantities for market by training them against walls, where they do not flourish in the open field. By this practice, and by enclosures and acclimation, the growth of this excellent fruit may be extended to the coldest parts of the United States.

Transplanting—should be performed with care, as in the case of all other fruit-trees. Every injured root should be cut off smooth from the under side, slanting out from the tree. Leave the roots, as nearly as possible, in the position in which they were before. Set the tree an inch lower than it stood in the nursery; it saves the danger of the roots getting uncovered, and of too strong action of the atmosphere on the roots, in a soil so loose. The opposite is often recommended, viz., to allow the tree in its new location to stand an inch or two higher than before; but we are sure, from repeated trials, that it is wrong. Shake the fine earth as closely around the roots as possible, mulch well, and pour on a pailful of tepid water, if it be rather a dry time, and the tree will be sure to live and make a good growth the first year. When a peach-tree is transplanted, after one year's growth from the bud, it should have the top cut off within eighteen inches or two feet of the ground, and all the limbs cut off at half their length. This will induce the formation of a full, large head. A low, full-branching head is always best on a peach-tree.

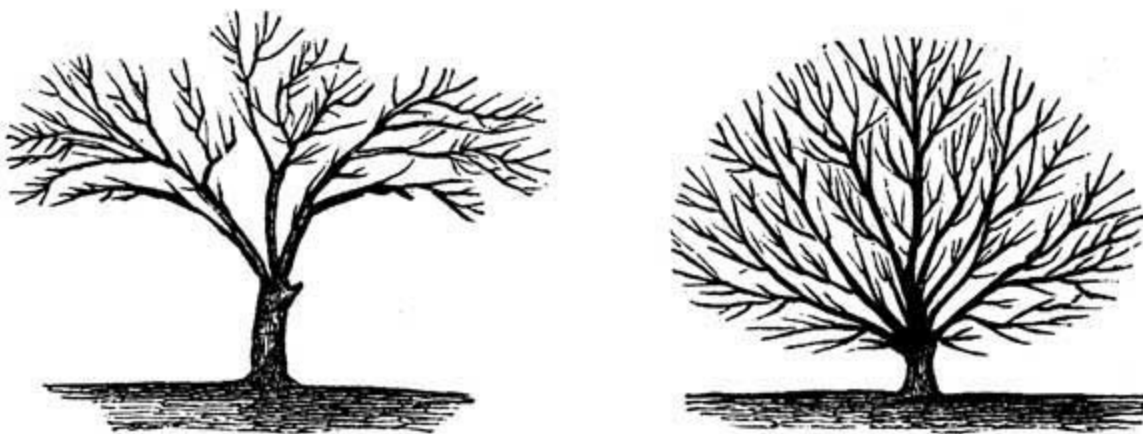
Pruning is perhaps the most important matter in successful peach culture. The fruit is borne wholly on wood of the previous year's growth. Hence a tree that has the most of that growth, in a mature state, and properly situated, will bear the most and the finest fruit. A tree left to its natural state, with no pruning but of a few of the lower limbs from the main trunk, will soon exhibit a collection of long naked limbs, without foliage, except near their extremities (see the cut overleaf). In this case fruit will be too thick on what little bearing wood there is, and it should be thinned. But very few cultivators even attend to that. The fruit is consequently small, and it weakens the growth of the young wood above, for next year's fruiting, and thus tree and fruit are perpetually deteriorating.

Observe a shoot of young peachwood, you will see near its base, leaf-buds. On the middle there are many blossom-buds, and on the top, leaf-buds again. The tendency of sap is to the extremity. Hence the upper leaf-buds will put out at once. And for their growth, and the maturity of the excessive fruit on the middle, the power of the sap is so far exhausted, that the leaf-buds at the base do not grow. Hence when the fruit is removed, nothing is left below the terminal shoots, but a bare pole. This is the condition in which we find most peach-trees.

For this there is a certain preventive. It consists in shortening in, by cutting

off in the month of September, from a third to a half of the current season's growth. If the top be large, cut off one half the length of the new wood. If it be less vigorous and rank, and you fear you will not have room for a fair crop of peaches, cut off but one third. This heading-in is sometimes recommended to be done in the spring. For forming a head in a young tree the spring is better. But to mature the wood, and increase the quantity, and improve the quality of the fruit, September is much the best.

Such shortening in early in September, directs the sap to maturing the wood, already formed and developing fruit-buds, instead of promoting the growth of an undue quantity of young and tender wood, to be destroyed by the winter, or to hinder the growth of the fruit of the next season. This heading-in process, with these young shoots, is most easily performed with pruning shears, with wooden handles, of a length suited to the height of the tree.



Neglected Peach-Tree. Properly-trimmed Peach-Tree.

But a work to precede this annual shortening-in, is the original formation of a head to a peach-tree. Take a tree a year old from the bud, and cut it down to within two and a half feet from the ground. Below that numerous strong shoots will come out. Select three vigorous ones and let them grow as they please, carefully pinching off all the rest. In the fall you will have a tree of three good strong branches. In the next spring cut off these three branches, one half. Below these cuts, branches will start freely. Select one vigorous shoot to continue the limb, and another to form a new branch. Check the growth of the shoots below, by cutting off their ends, but do not rub them off, as they will form fruit branches. At the close of the season you will have a

tree with six main branches, and some small ones for fruit, on the older wood. Repeat this process the third year, and you have a tree with twelve main branches, and plenty smaller ones for fruit. All these small branches on the old wood, should be shortened in half their length, to cause the leaf-buds near their base to start, so as to produce large numbers of young shoots. Continue this as long as you please, and make just as large a head and just such a form as you may wish, being careful only to control the shape of the top so as to let the sun and air freely into every part.

Trees thus trained may be planted thick enough to allow four hundred to stand on an acre, and will bear an abundance of the finest fruit, and all low enough to be easily picked. This method of training is much better than allowing the tree to shoot out on all sides from the ground: in that case, the branches are apt to split down and perish. This system of heading-in freely every year, preserves the life and health of the tree remarkably. Many of the finest peach-trees in France are from thirty to sixty years old, and some a hundred. We may, in this country, have peach-trees live fifty years, in the most healthy bearing condition. By trimming in this way, and carrying out fully this system, some have thrifty-looking peach-trees, more than a foot in diameter, bearing the very best of fruit. It is sheer neglect that causes our peach-orchards to perish after having borne from three to six years. Let every man who plants a peach-tree remember, that this system of training will make his tree live long, be healthy, grow vigorously, and bear abundantly.

Diseases of peach-trees have been a matter of much speculation. The result is, that the hope of the peach-grower is mainly in preventives.

The Yellows is usually regarded as a disease. Imagination has invented many causes of this evil. Some suppose it to be produced by small insects; others that it is in the seed. Again, it is ascribed to the atmosphere. It has been supposed to be propagated in many ways—by trimming a healthy tree with a knife that had been used on a diseased one; by contagion in the atmosphere, as the measles or small-pox; by impregnation from the pollen, through the agency of winds or bees; by the migration of small insects; or by planting diseased seeds, or budding from diseased trees. This great diversity of opinion leaves room to doubt whether the yellows in peach-trees be a disease at all, or only a symptom of general decay. The symptoms, as given in all the fruit-books, are only such as would be natural from decay and death of the

tree, from any cause whatever. This may result from neglect to supply the soil with suitable manures, and to trim trees properly, and especially from over-bearing. This view of the case is more probable, from the fact that none pretend to have found a remedy. All advise to remove the tree thus affected at once, root and branch. We have seen the following treatment of such trees tried with marked success. Cut off a large share of the top, as when you would renew an old, neglected tree; lay the large roots bare, making a sort of basin around the body of the tree, and pour in three pailfuls of *boiling* water: the tree will start anew and do well. This is an excellent application to an old, failing peach-tree. The sure preventive of the yellows is, planting seeds of healthy trees, budding from the most vigorous, heading-in well, supplying appropriate manures, and general good cultivation.

Curled Leaves is another evil among peach-trees, occurring before the leaves are fully grown, and causing them to fall off after two or three weeks. Other leaves will put out, but the fruit is destroyed, and the general health of the tree injured. Elliott says the curl of the leaf is produced by the punctures of small insects. One kind of curled leaf is, but not this. But we have no doubt that Barry's theory is the correct one, viz., that it is the effect of sudden changes of the weather. We have noticed the curled leaf in orchards where the trees were so close together as to guard each other. On the side where the cold wind struck them, we noticed they were badly affected; while on the warm side, and in the centre where they were protected by the others, they exhibited very few signs of the curl. In western New York, unusual cold east winds always produce the curled leaves, on trees much exposed: hence, the only remedy is the best protection you can give, by location, &c.

Mildew is a minute fungus growing on the ends of tender shoots of certain varieties, checking their growth, and producing other bad effects. Syringe the trees with a weak solution of nitre, one ounce in a gallon of water, which will destroy the fungus and invigorate the tree.

The Borer has been the great enemy of the peach-tree, since about the close of the last century. The female insect, that produces the worms, deposits her eggs under rough bark, near the surface of the ground. This is done mostly in July, but occasionally from June to October. The eggs are laid in small punctures, and covered with a greenish glue; in a few days they come out, a small white worm, and eat through the bark where it is tender, just at, or a

little below, the surface of the ground; they eat under the bark, between that and the wood, and, consuming a little of each, they frequently girdle the tree; as they grow larger, they perforate the solid wood; when about a year old, they make a cocoon just below the surface of the ground, change into a chrysalis state, and shortly come out a winged insect, to deposite fresh eggs. But the practical part of all this is the *remedy*: keep the ground clean around the trees, and rub off frequently all the rough bark; place around each tree half a peck of air-slaked lime, and the borer will not attack it. This should be placed there on the first of May, and be spread over the ground on the first of October; refuse tobacco-stems, from the cigar-makers, or any other offensive substance, as hen-manure, salt and ashes, &c., will answer the same purpose. We should recommend the annual cultivation of a small piece of ground in tobacco, for use around peach-trees. We have found it very successful against the borer, and it is an excellent manure; applied two or three times during the season, it proves a perfect remedy, and is in no way injurious, as an excessive quantity of lime might be.

Leaf Insects.—There are several varieties, which cause the leaves to curl and prematurely fall. This kind of curled leaf differs from the one described as the result of sudden changes and cold wind; that appears general wherever the cold wind strikes the tree, while this only affects a few leaves occasionally, and those surrounded by healthy leaves. The remedy is to syringe them with offensive mixtures, as tobacco-juice, or sprinkle them when wet with fine, air-slaked lime.

Varieties.—Their name is legion, and they are rapidly increasing, and their synonyms multiplying. A singular fact, in most of our fruit-books, is a minute description of useless kinds, and such descriptions of those that they call good, as not one in ten thousand cultivators will ever try to master—they are worse than useless, except to an occasional amateur cultivator.

Elliott, in his fruit-book, divides peaches into three classes: the first is for general cultivation; under this class he describes thirty-one varieties, with ninety-eight synonyms. His second class is for amateur cultivators, and includes sixty-nine varieties, with eighty-four synonyms. His third class, which he says are unworthy of further cultivation, describes fifty-four varieties, with seventy-seven synonyms. Cole gives sixty-five varieties, minutely described, and many of them pronounced worthless. In Hooker's

Western Fruit-Book, we have some eighty varieties, only a few of which are regarded worthy of cultivation. Downing gives us one hundred and thirty-three varieties, with about four hundred synonyms. In all these works the descriptions are minute. The varieties of serrated leaves, the glandless, and some having globose glands on the leaves, and others with reniform glands. Then we have the color of the fruit in the shade and in the sun, which will, of course, vary with every degree of sun or shade. We submit the opinion that those books would have possessed much more value, had they only described the best mode of cultivating peaches, without having mentioned a single variety, thus leaving each cultivator to select the best he could find. Had they given a plain description of ten, or certainly of not more than fifteen varieties, those books would have been far more valuable *for the people*. We give a small list, including all we think it best to cultivate. Perhaps confining our selection to half a dozen varieties would be a further improvement:—

1. The first of all peaches is *Crawford's Early*. This is an early, sure, and great bearer, of the most beautiful, large fruit;—a good-flavored, juicy peach, though not the very richest. It is, on the whole, the very best peach in all parts of the country. Time, from July 15th to September 1st. Freestone.
2. *Crawford's Late* is very large and handsome; uniformly productive, though not nearly so good a bearer as *Crawford's Early*. Ripens last of September and in October. Fair quality, and always handsome; freestone; excellent for market.
3. *Columbia*.—Origin, New Jersey. It is a thoroughly-tested variety, raised and described by Mr. Cox, who wrote one of the earliest and best American fruit-books. Fine specimens were exhibited in 1856, grown in Covington, Ky. Excellent in all parts of the United States. Freestone.
4. *George the Fourth*.—A large, delicious, freestone peach, an American seedling from Mr. Gill, Broad street, New York. The National Pomological Society have decided the tree to be so healthy and productive as to adapt it to all localities in this country. It has twenty-five synonyms.
5. *Early York*.—Freestone; the best, and first really good, early peach. Time July at Cincinnati, and August at Cleveland. Time of ripening of all varieties varies with latitude, location, and season.

6. *Grass Mignonne*.—A foreign variety, a great favorite in France, in the time of Louis XIV. Very rich freestone, flourishing in all climates from Boston south. The high repute in which it has long been held is seen in its thirty synonyms. One of the best, when you can obtain the genuine. Time, August.

7. *Honest John*.—A large, beautiful, delicious, freestone variety. Highly prized as a late peach, maturing from the middle to the last of October. Indispensable in even a small selection.

8. *Malacatune*.—A very popular American freestone peach, derived from a Spanish, and is the parent of the Crawford peaches, both early and late.

9. *Morris White*.—Everywhere well known; a good bearer; best for preserving at the North; a good dessert peach South.

10. *Morris Red Rare-ripe*.—A favorite, freestone, July peach. The tree is healthy and a great bearer.

11. *Old Mixon*.—Should be found in all gardens and orchards; it is of excellent quality and ripens at a time when few good peaches are to be had; it endures spring-frosts better than any other variety; profitable.

12. *Old Mixon Cling*.—One of the most delicious early clingstones. Deserves a place in all gardens.

13. *Monstrous Cling*.—Not the best quality, but profitable for market on account of its great size.

14. *Heath Cling*.—Very good South and West. Wrapped in paper and laid in a cool room, it will keep longer than any other variety. Tree hardy and often produces when others fail. Excellent for preserving, and when quite ripe, is superior as a dessert fruit.

15. *Blood Cling*.—A well-known peach, excellent for pickling and preserving. It sometimes measures twelve inches in circumference. The old French Blood Cling is smaller. Many of these varieties will be found under other names. You will have to depend upon your nursery-man to give you the best he has, and be careful to bud from any choice variety you may happen to taste. Difficulties and disappointments will always attend efforts to get desired varieties.

PEAR.

The pear is a native of Europe and Asia, and, in its natural state, is quite as unfit for the table as the crab-apple. Cultivation has given it a degree of excellence that places it in the first rank among dessert-fruits. No other American fruit commands so high a price. New varieties are obtained by seedlings, and are propagated by grafting and budding: the latter is generally preferred. Root-grafting of pears is to be avoided; the trees will be less vigorous and healthy. The difficulty of raising pear-seedlings has induced an extensive use of suckers, to the great injury of pear-culture. Fruit-growers are nearly unanimous in discarding suckers as stocks for grafting. The difficulty in raising seedling pear-trees is the failure of the seeds to vegetate. A remedy for this is, never to allow the seeds to become dry, after being taken from the fruit, until they are planted. Keep them in moist sand until time to plant them in the spring, or plant as soon as taken from the fruit. The spring is the best time for planting, as the ground can be put in better condition, rendering after-culture much more easy. The pear will succeed well on any good soil, well supplied with suitable fertilizers. The best manures for the pear are, lime in small quantities, wood-ashes, bones, potash dissolved, and applied in rotten wood, leaves, and muck, with a little stable-manure and iron-filings—iron is very essential in the soil for the pear-tree. In all soils moderately supplied with these articles, all pear-trees grafted on seedling-stocks, and those that flourish on the foreign quince, will do well. A good yellow loam is most natural; light sandy or gravelly land is unfavorable. It is better to cart two or three loads of suitable soil for each tree on such land. The practice of budding or grafting on apple-stocks, on crab-apples, and on the mountain-ash, should be utterly discarded. For producing early fruit, quince-stocks and root-pruning are recommended.

Setting out pear-trees properly is of very great importance. The requisites are, to have the ground in good condition, from manure on the crop of the last season, and thoroughly subsoiled and drained. Pear-trees delight in rather heavy land, if it be well drained; but water, standing in the soil about them, is utterly ruinous. Pear-trees, well transplanted on moderately rich land, well subsoiled and well drained, will almost always succeed. By observing the following brief directions, any cultivator may have just such shaped tops on his pear-trees as he desires. Cut short any shoots that are too vigorous, that

those around them may get their share of the sap, and thus be enabled to make a proportionate growth. After trees have come into bearing, symmetry in the form of their heads may be promoted by pinching off all the fruit on the weak branches, and allowing all on the strong ones to mature.

Those two simple methods, removing the fruit from too vigorous shoots, and cutting in others, half or two-thirds their length, will enable one to form just such heads as he pleases, and will prove the best preventives of diseases.

Diseases.—There are many insects that infest pear-orchards, in the same manner as they do apples, and are to be destroyed in the same way. The slugs on the leaves are often quite annoying. These are worms, nearly half an inch long, olive-colored, and tapering from head to tail, like a tadpole. Ashes or quicklime, sprinkled over the leaves when they are wet with dew or rain, is an effectual remedy.

Insect-Blight.—This has been confounded with the frozen-sap blight, though they are very different. In early summer, when the shoots are in most vigorous growth, you will notice that the leaves on the ends of branches turn brown, and very soon die and become black. This is caused by a worm from an egg, deposited just behind or below a bud, by an insect. The egg hatches, and the worm perforates the bark into the wood, and commits his depredations there, preventing the healthy flow of the sap, which kills the twig above. Soon after the shoot dies, the worm comes out in the form of a winged insect, and seeks a location to deposit its eggs, preparatory to new depredations. The remedy is to cut off the shoots affected at once, and burn them. The insect-blight does not affect the tree far below the location of the worm. Watch your trees closely, and cut off all affected parts as soon as they appear, and burn them immediately, and you will soon destroy all the insects. But very soon after the appearance of the blight they leave the limb; hence a little delay will render your efforts useless. These insects often commit the same depredations on apple and quince-trees. We had an orchard in Ohio seriously affected by them. We know no remedy but destruction as above.

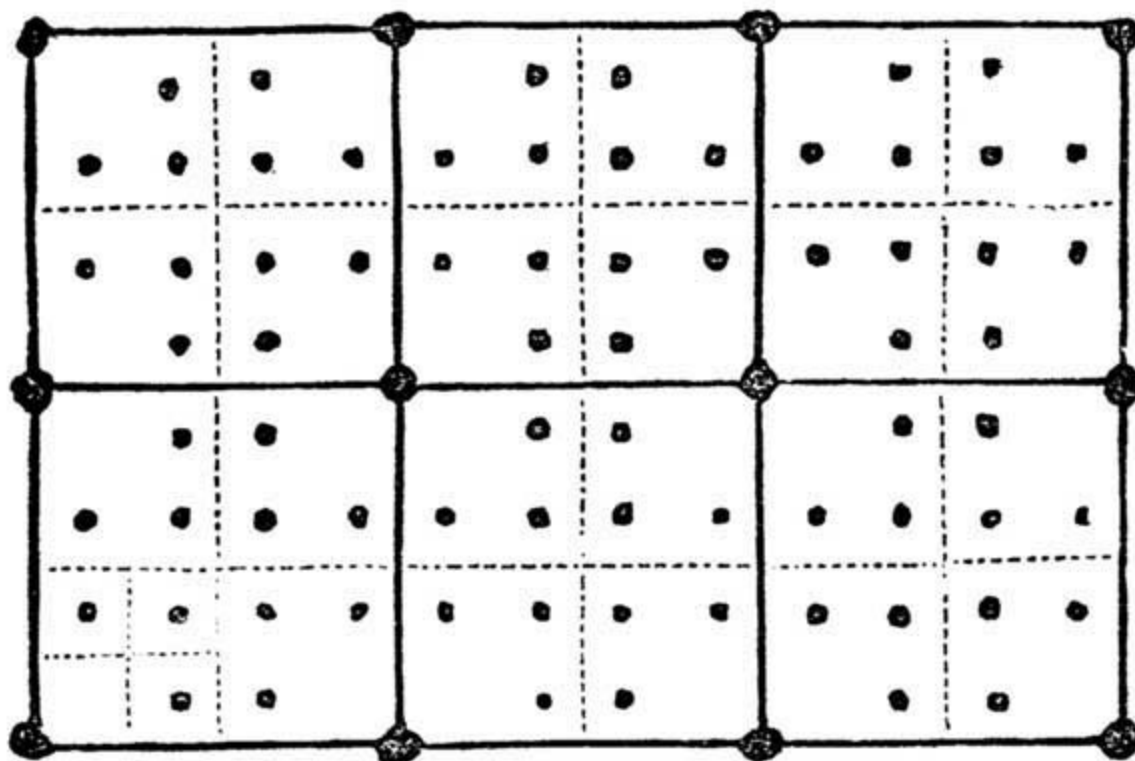
The Frozen-Sap Blight is a much more serious difficulty. Its nature and origin are now pretty well settled. In every tree there are two currents of sap: one passes up through the outer wood, to be digested by the leaves; the other passing down in the inner bark, deposits new wood, to increase the size of

the tree. Now, in a late growth of this kind of wood, the process is rapidly going on, at the approach of cold weather, and the descending sap is suddenly frozen, in this tender bark and growing wood. This sudden freezing poisons the sap, and renders the tree diseased. The blight will show itself, in its worst form, in the most rapid growing season of early summer, though the disease commenced with the severe frosts of the previous autumn. Its presence may be known by a thick, clammy sap, that will exude in winter or spring pruning, and in the discoloration of the inner bark and pith of the branches. On limbs badly affected on one side, the bark will turn black and shrivel up. But its effects in the death of the branches only occur when the growth of the tree demands the rapid descent of the sap: then the poisoned sap which was arrested the previous fall, in its downward passage, is diluted and sent through the tree; and when it is abundant, the whole tree is poisoned and destroyed in a few days; in others more slightly affected, it only destroys a limb or a small portion of the top. Another effect of this fall-freezing of sap and growing wood, is to rupture the sap-vessels, and thus prevent the inner bark from performing its functions. This theory is so well established, that an intelligent observer can predict, in the fall, a blight-season the following summer. If the summer be cool, and the fall warm and damp, closed by sudden cold, the blight will be troublesome the next season, because the plentiful downward flow of sap, and rapid growth of wood, were arrested by sudden freezing. If the summer is favorable, and the wood matures well before cold weather, the blight will not appear. This is of the utmost practical moment to the pear-culturist. Anything in soil, situation, or pruning, that favors early maturity of wood, will serve as a preventive of blight; hence, cool, moist situations are not favorable in climates subject to sudden and severe cold weather in autumn. Root-pruning and heading-in, which always induce early maturity of wood, are of vast importance; they will, almost always, prevent frozen-sap blight. If, in spite of you, your pear-trees will make a late luxuriant growth, cut off one half of the most vigorous shoots before hard freezing, and you will check the flow of sap, by removing the leaves and shoots that control it, and save your trees. If blight makes its appearance, cut off at once all the parts affected. The effects will be visible in the wood and inner bark, far below the external apparent injury. Remove the whole injured part, or it will poison the rest of the tree. When this frozen sap is extensive, it poisons and destroys the whole tree; when slight, the tree often wholly recovers. If a spot of black, shrivelled bark appears, shave it off, deep

enough to remove the affected parts, and cover the wound with grafting-wax. Remove all affected limbs. These are the only remedies. But the practice of pruning both roots and branches will prove a certain preventive. A tree growing in grass, where it grows more slowly, and matures earlier in the season, will escape this blight; while one growing in very rich garden soil, and continuing to grow until cold weather, will suffer severely. The effects on orchards, in different soils and localities everywhere, confirm this theory. A little care then will prevent this evil, which has sometimes been so great as to discourage attempts at raising pears. In some localities, some of the finer varieties of pears, as the virgalieu, are ruined by cracking on the trees before ripening. Applications of ashes, salt, charcoal, iron-filings, and clay on light lands, will remedy this evil.

Distances apart.—All fruit-trees had better occupy as little ground as is consistent with a healthy vigorous growth. They are manured and well cultivated, at a much less expense. The trees protect each other against inclement weather. The fruit is more easily harvested. And it is a great saving of land, as nothing else can be profitably grown in an orchard of large fruit-trees. The two kinds of pear-trees, dwarf and standard, may be planted together closely and be profitable for early and abundant bearing. The plan given on the next page of a pear-orchard, recommended in Cole's Fruit Book, is the best we have seen.

In the plan the trees on pear-stocks, designed for standards, occupy the large black spots where the lines intersect. They are thirty-three feet apart. The small spots indicate the position of dwarf-trees on quince stocks. Of these there are three on each square rod. An acre then would have forty standard trees, and four hundred and eighty dwarfs. The latter will come into early bearing, and be profitable, long before the former will produce any fruit. This will induce and repay thorough cultivation. They should be headed in, and finally removed, as the standards need more room. One acre carefully cultivated in this way, will afford an income sufficient for the support of a small family.



Plan of a Pear-Orchard.

Gathering and Preserving.—Most fruits are better when allowed fully to ripen on the tree. But with pears, the reverse is true; most of them need to be ripened in the house, and some of them, as much as possible, excluded from the light. Gather when matured, and when a few of the wormy full-grown ones begin to fall, but while they adhere somewhat firmly to the tree. Barrel or box them tight, or put them in drawers in a cool dry place. About the time for them to become soft, put them in a room, with a temperature comfortable for a sitting-room, and you will soon have them in their greatest perfection. They do better in a warm room, wrapped in paper or cotton. A few only ripen well on the trees. Those ripened in the house keep much longer and better.

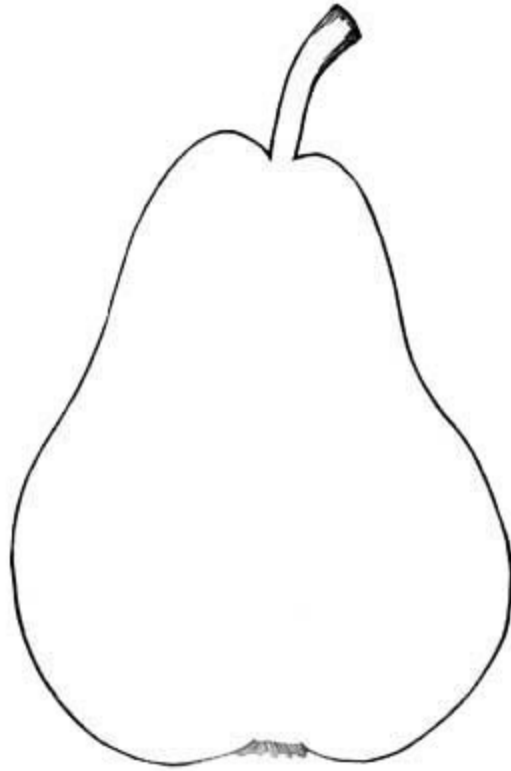
Varieties.—The London Horticultural Society have proved seven hundred varieties, from different parts of the world, in their experimental garden. Cole speaks of eight hundred and Elliott of twelve hundred varieties. There are now probably more than three thousand growing in this country. Many seedlings, not known beyond the neighborhood where they originated, may be among our very best. From six to ten varieties are all that need be cultivated. We present the following list, advising cultivators to select five or six to suit their own tastes and circumstances, and cultivate no more. We do

not give the usual descriptions of the varieties selected. The mass of cultivators, for whom this work is specially intended, will never learn and test the descriptions. They will depend upon their nursery-man, and bud and graft from those they have tasted.

We give their names and some of their synonyms, their adaptation to quince or pear stocks, their manner of growth, and time of maturity. These will enable the culturist to select whatever best suits his taste; adapted to quince or pear stocks; for the table or kitchen; for summer, fall, or winter use, and for home or the market.

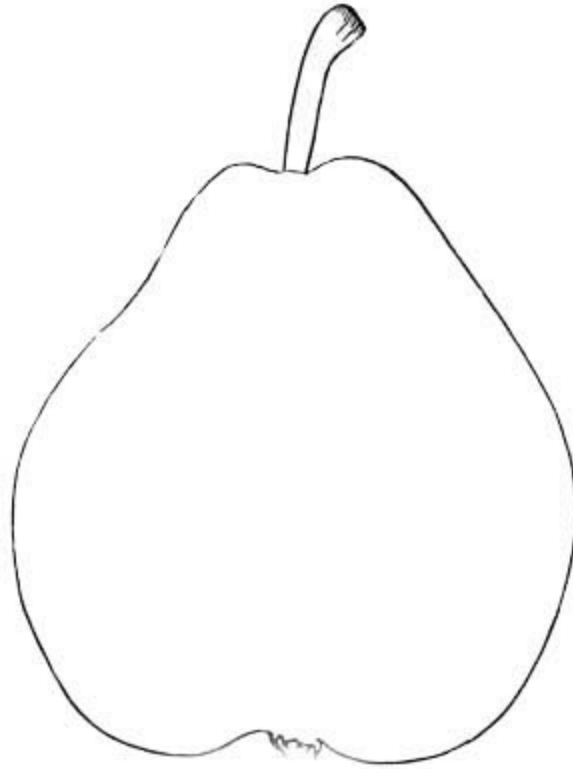
BELLE LUCRATIVE.—*Fondante d' Automne, Seigneur d' Esperin*. Tree of moderate growth, but a great bearer. A fine variety, on quince or pear, better perhaps on the pear stock. Season, last of September.

BEURRÉ EASTER with fifteen synonyms that few would ever read. Best on quince. Requires a warm soil and considerable care in ripening, when it proves one of the best. Its season—from January to May—makes it very desirable. Large, yellowish-green, with russet spots.



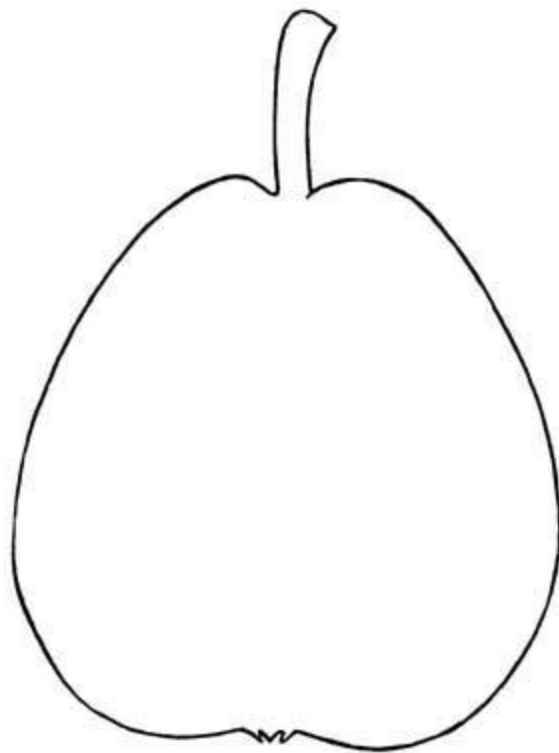
Bartlett.

BARTLETT.—*William's, William's Bon Chretien, Poire Guillaume*. Tree, a vigorous grower, and a regular, early, good bearer, of long, handsome, perfectly-formed fruit; on the quince or pear stock. Time, August and September.



Beurré Diel.

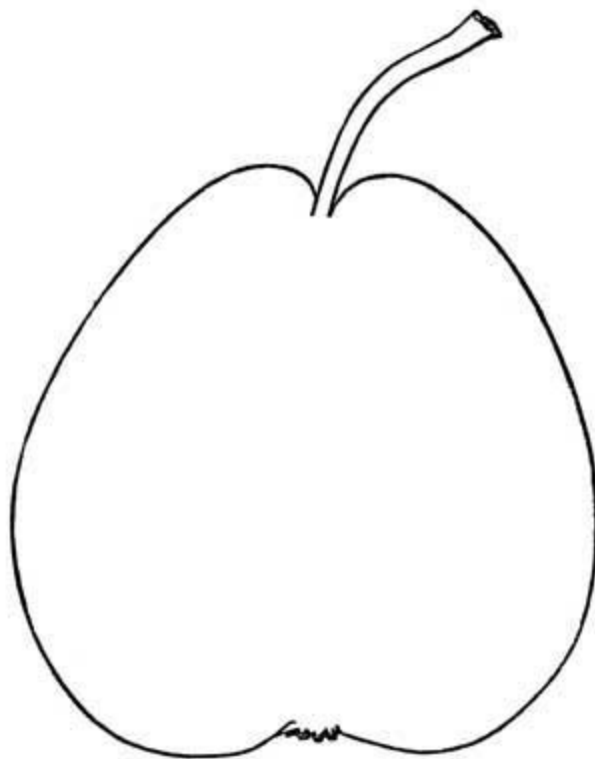
BEURRÉ DIEL.—*Diel, Diel's Butterbirne, Dorothee Royale, Grosse Dorothee, Beurré Royale, Des Trois Tours, De Melon, Melon de Kops, Beurré Magnifique, Beurré Incomparable.* Grows well on quince or pear, but perhaps does best on quince. Large, beautiful, luscious fruit. Season, October to last of November.



White Doyenne.

WHITE DOYENNE.—*Virgalieu*. Tree vigorous and hardy on pear or quince. Everywhere esteemed as one of the very best. Needs care in supplying proper manure and clay on light soils, to prevent the fruit from cracking. September to November. If we could have but one we should choose this.

COLUMBIA.—*Columbian Virgalieu*. Native of New York, bearing abundantly, a uniformly smooth, fair, large fruit. Color, fine golden yellow, dotted with gray. Season, December and January.



Flemish Beauty.

FLEMISH BEAUTY.—*Belle de Flanders, &c.* This is a large, beautiful, and delicious pear. One of the finest in its season, but does not last long. Ripens last of September. Very fine on the quince, and is excellent on the rich prairie-lands of the West. Deserves increased attention.

BEURRÉ D'AREMBERG.—*Duc d'Aremberg, and eight other synonyms.* Tree very hardy, does well on the pear stock, and bears early, annually, and abundantly. A very fine foreign variety. The fruit hangs on the tree well, and may be ripened at will from December to February, by placing in a warm room, when you would ripen them.

BUFFUM.—A native of Rhode Island, and very successful wherever grown. A great bearer of handsome fruit, though not of the best quality. It is, however, an excellent orchard pear. Fruit, medium size, ripening in September.

LOUISE BONNE OF JERSEY.—*William the Fourth, and three other useless foreign synonyms.* Not surpassed, on the quince. Tree very vigorous, producing a great abundance of large fruit. Season, October.

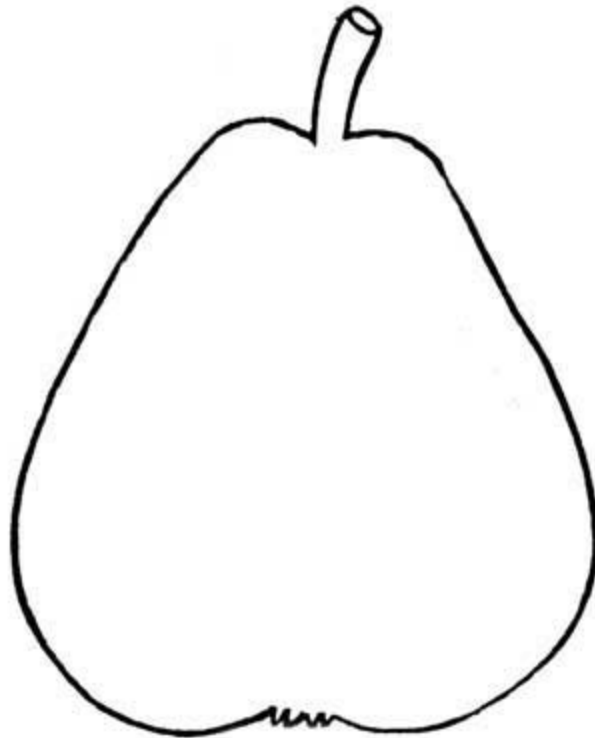
MADELEINE.—*Magdalen, Citron des Carmes.* This bears an abundance of

small but delicious fruit. Is valuable also on account of its season—the last half of July. Good on pear or quince. Must be checked in its growth, on very rich land, or it will be subject to the frozen sap-blight.

ONONDAGA.—American origin. Equally good on pear or quince. Large, hardy, and very productive tree. The fruit is very large, fine golden yellow when ripe. Excellent for market. Season, October and November.

POUND PEAR.—*Winter Belle*, and twelve other synonyms, which are unimportant. This is the great winter-pear for cooking. The tree is a very vigorous grower and great bearer. A very profitable orchard variety. December to March.

PRINCE'S ST. GERMAIN.—*New St. Germain*, *Brown's St. Germain*. Hardy and productive. Good keeper, ripening as easily and as well as an apple. December to March.



Seckel.

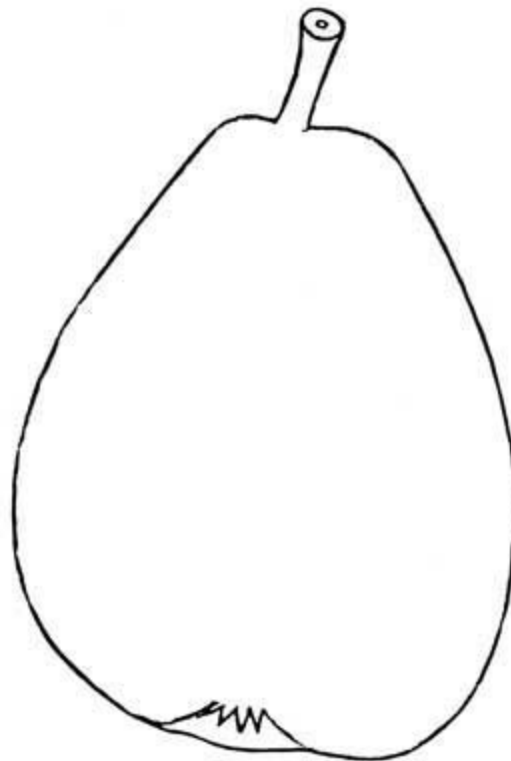
SECKEL.—There are a number of synonyms, but it is always known by this

name. Tree is small, but a good and regular bearer of small excellent fruit. Time in warm climates, September and October.

STEVEN'S GENESEE.—*Stephen's Genesee, Guernsey*. Desirable for all orchards and gardens, on quince or pear. Fine grower and very productive. Fruit large and excellent. Elliott says "even the wind-falls are very fine."

VICAR OF WAKEFIELD.—Eight synonyms, but it will hardly be mistaken by nursery-men. Does well on quince. It is thrifty and very productive of fruit of second quality. Yet it is generally profitable. November to January.

WINTER NELLIS.—Its six foreign synonyms are of no consequence. This is the best of all winter-pears, grown on quince or pear. Exceedingly well adapted to the rich western prairies. An early and great bearer. November to January 15.



Gray Doyenne.

GRAY DOYENNE.—A superior October pear. Tree hardy and productive on both pear or quince. Partakes much of the excellence of the White Doyenne.

From these you can select five or six just adapted to your wishes. The diversity of views, of the merits of different varieties of pears, arises mainly from the influence of location, soil, and culture. The established known varieties, may be grown in great perfection anywhere, with suitable care. At the West they *must be root-pruned and headed-in* until they are ten years old, after which they will be hardy and productive. If allowed to grow as fast as they will incline to, on alluvial soils, when they are exposed to severe winters, they will disappoint growers. With care they will be sure and profitable.

PEPPERS.

The red peppers, cultivated in this country, are used for pickling, for pepper-sauce, as a condiment for food, and as a domestic medicine.

Varieties—are named principally from their shape. The *large squash-pepper* is best for green pickles, on account of its size and tenderness. The *Cayenne*, a small, long variety, much resembling the original from which it is named, is very pungent, used mostly for pepper-sauce. Grind, not very fine, any of the varieties, and they are useful on any food of a cold nature and not easily digestible. They are all good for medicinal purposes. The capsicum needs a dry, warm soil, with exposure to the sun. Plants should stand two feet apart each way; as they are slow growers, they should be started in an early hotbed. Many will ripen during summer, and may be gathered. In the fall, when frost comes, the vines will be covered with blossoms and with peppers of all sizes. Fall-grown green ones, strung on a thread, and hung in a warm, dry room, will ripen finely. They are very hardy, and may be transplanted without injury. Hen-manure is best for them.

PEPPERGRASS.

This is a variety of cress, of quick growth, used as lettuce. On a rich, finely-pulverized soil, sow the seeds in drills, fifteen inches apart, and cover very lightly. Sow thick and water in dry weather. For use, cut the tops while they are very tender. A second crop will grow, but inferior to the first. The water-cress, growing spontaneously by rills and springs, is a kind of wild peppergrass, and is by some persons more esteemed than the garden variety.

We prefer early lettuce to cresses or peppergrass, and see no reason for their cultivation, but their rapid growth.

PLOWING.

This is one of the most important matters in soil-culture. When, how, and how much, shall we plow? are the three questions involving the whole. When should plowing be done? As it respects wet or dry, plow sandy or gravelly land whenever you are ready. It will neither be hard when dry, nor injured by being plowed when very wet. Good loams may be plowed at all times except when excessively wet. Clays can only be worked profitably when neither excessively wet or dry. Plowing land in a warm rain is almost equal to a coat of manure. Plowing in a light snow in the spring will injure it the whole season. We have noticed a marked difference in corn growing but a rod apart, on land where snow was plowed in, and the other plowed two or three days later, after the snow was gone; this difference was noticeable in the rows throughout the entire field. Spring or fall plowing is a question that has been much discussed. Sod-land is better plowed in the fall. The action of winter rains and frosts on the turf is beneficial. The same is true of land trenched deep, where much of the hard, poor subsoil is brought to the surface: it is benefited by winter exposure. Other cultivated fields are injured by fall-plowing, unless it be very early. All stubble-land is much benefited by being plowed as soon as the grain is taken off. The weeds and stubble, plowed under, will be decomposed by the warm weather and rains, and benefit the soil almost as much as an ordinary coat of manure. Plowed late, such action does not take place, and the surface is injured by winter-exposure: hence, do all the *early* fall-plowing possible, but plow nothing *late* in the fall but sod-land.

How shall we plow? All land should be subsoiled, except that having a light, porous subsoil; one deep plowing on such land is sufficient. Subsoiling is done by using two teams at once—one with a common plow, running deep, and the other with a subsoil-plow with no mould-board, and which will, consequently, stir and disintegrate the earth to the depth at which it runs, without throwing it to the surface. The next surface-furrow will cover up this loosened subsoil. In this way, land may be plowed eighteen inches deep, to the great benefit of any crop grown on it. If the surface be well manured, this

method of plowing will place the manure between the first furrow and the subsoil, and increase its value. Such plowing is very valuable on land for young fruit-trees. There is another method, which we denominate double-plowing, which is more beneficial than ordinary subsoiling: it is performed by two common plows, one following in the furrow of the other; the first furrow need not be very deep—let the furrow in the bottom of the first be as deep as possible, and thrown out upon the surface; the next furrow will throw the surface and manure into the bottom of the deep furrow; the next furrow will cover this surface-soil and manure very deep, and, as manure always works up, it will impregnate the whole. This, for garden-vegetables, berries, nurseries, or young orchards, is the best form of plowing that we have ever tried. It may be done with one team, by simply changing the gauge of the clevis every time round, gauging it light for the first furrow, and deep for the second. We once prepared a plat in this way with one team, on which cabbages made a remarkable growth, even in a dry season. Still a farther improvement would be a light coat of fine manure on the surface. All furrows, in every description of plowing, should be near enough together to move the whole, leaving no hard places between them. The usual "cut and cover" system, to get over a large area in a day, is miserable economy. The more evenly and flatly land can be turned over in plowing, the better it will be; it retards the growth of weeds, and secures a better action upon substances plowed under. An exception to deep plowing is in breaking up the original prairies of the West: they have to be broken with plows kept sharp as a knife, and not more than two inches deep. The grass then dies and the sod rots. But plowed deep, the grass comes up through the turf, and will prove troublesome for two or three years. It must also be broken at a certain season of the year, to insure success. It may be profitably done for two months after the grass gets a good start in the spring.

How much is it best to plow land? Once double-plowed, or thoroughly subsoiled, and well turned over, is better than more. Land once plowed so as to disintegrate the whole to the depth of the furrow, will produce more, and require less care, than the same would do if cross-plowed once or twice. Excessive plowing is a positive injury. All land should be broken up once in three or four years, and not kept longer than that under the plow at one time. Some farmers keep land perpetually in grass, refusing to have a plow touch it on any condition. They see wrong tillage produce barrenness. But by this

practice they are great losers; they never get over one half the hay or pasturage that could be obtained by frequent tillage and manuring, and a rotation of crops.

PLUM.

This is one of our best fruits, but suffers more from enemies than any other.

Propagation is by seeds or layers, budding or grafting. Seeds from trees not exposed to mixture with other varieties in the blossom, will produce the same; hence, this is the best method of propagating a given variety, standing alone. But, for most situations, budding is preferable to any other method. This should be performed earlier than on the peach. The plum matures earlier, and hence should be budded about the last of July, or first of August. Bud on the north side of the tree to avoid the hot sun; and tie more tightly than in budding other trees. Bud plum-trees the second year from the seed. Grafting should be resorted to only when buds have failed, and there is a prospect that the trees will be too large for budding another season. The common wild plums make good stocks, if grafted at the ground. Thoroughly mulch all newly-grafted plum-trees. Root-grafting will succeed, but should never be practised. In all grafting of plums, put the graft in at the surface of the ground, and cover with sawdust or mould, leaving but one bud on the graft exposed.

Soil.—All soils are good for the plum, provided they be thoroughly drained, and properly fertilized.

Hard soils are recommended as being almost proof against the curculio. That a soil affording a rather hard, smooth surface, will afford less burrows for curculio, and consequently lessen their ravages, is no doubt true. But it is not a perfect remedy, and, on other accounts, such a soil is no better. A good firm loam is best. Plums will do well also on light land, but are more exposed to injury from the curculio.

Transplanting.—The plum being perfectly hardy, we recommend transplanting in autumn. Shorten in the top, cut off considerable of the tap-root, and the ends of the long roots, transplant well, and mulch so thoroughly as to prevent too strong action of the frost on the roots, and they will start

early and do well. Twelve feet apart for small varieties, and twenty feet for larger growers, are the distances usually recommended. We think a rod apart each way will do well for all varieties.

Pruning.—Once started in a regular growth, in such a shape as you desire, no further pruning will be necessary but occasionally heading-in a too luxuriant shoot, and removing diseased and cross limbs. On rich Western lands, and in warm Southern climes, young plum-trees must be root-pruned and headed-in, or they will be unfruitful and unhealthy. Root-pruning should be done in August, in the following manner. In case of a tree ten feet high, take a sharp spade, and in a circle around the tree, two feet from the trunk (making the circle four feet in diameter), cut off all the roots within reach. In smaller trees, make the circle smaller, and in larger ones, larger. At the same time, shorten in the current year's growth, by cutting off one half the length of all the principal shoots; this will give vigor, symmetry, and fruitfulness, and prove a valuable preventive of disease. Plum-trees should always have good, clean cultivation.

Manures from the stable and slaughter-house, with wood-ashes, lime, and plenty of salt, are the best for the plum. The following analysis, by Richardson, of the fruit of the plum, will aid the culturist in his selection of manures:—

Potash	59.21
Soda	.54
Lime	10.04
Magnesia	5.46
Sulphuric acid	3.83
Silicic acid	2.36
Phosphoric acid	12.26
Phosphate of iron	6.04

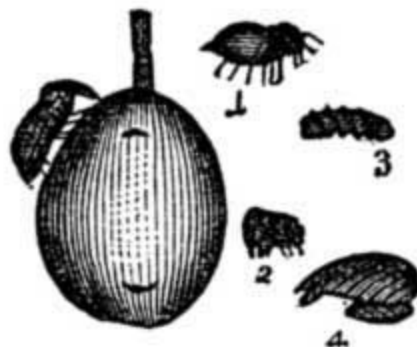
Hence, as wood-ashes contains much potash, and as this is the largest ingredient in the plum, it must be the best application to the soil for this fruit. Bones, dissolved in sulphuric acid, would also be very valuable. Bones, bonedust, salt, wood-ashes, and barnyard manure, with a little lime, will be all that will be necessary.

Diseases.—In most northern latitudes, the black wart, or knot, is fatal to many plum-trees. It is less prevalent at the South: its origin is not known. Many theories respecting it are put forth by different cultivators; they are unsatisfactory, and their enumeration here would be useless. It may be either the result of general ill health in the tree, from budding on suckers and unhealthy stocks, and a want of proper elements in the soil, or of improper circulation of sap, caused by the roots absorbing more than the leaves can digest. In the latter case, root-pruning and heading-in would be an effectual preventive. In the former, supply suitable manures, and give good cultivation. In every case, remove at once all affected parts, and wash the wounds and whole tree, and drench the soil under it, with copperas-water—one ounce of copperas to two gallons of water. This is stated to be a complete remedy.

Defoliation of seedlings and bearing trees often occurs in July and August. Land well supplied with the manures recommended, especially wood-ashes, salt, and the copperas-water, has not been known to produce trees that drop their leaves.

Decay of the Fruit is another serious evil. Professor Kirtland and others suppose it to be a species of fungus. Poverty of soil, and wet weather, may be the cause. If the season be unusually wet, thin the fruit, so that no two plums shall touch each other. Keep the soil properly manured, and spread charcoal or straw under the tree, and you will generally be able to preserve your fruit.

The Curculio is the great enemy of the plum, and frequently of all smooth-skinned fruits, as the grape, nectarine, &c.

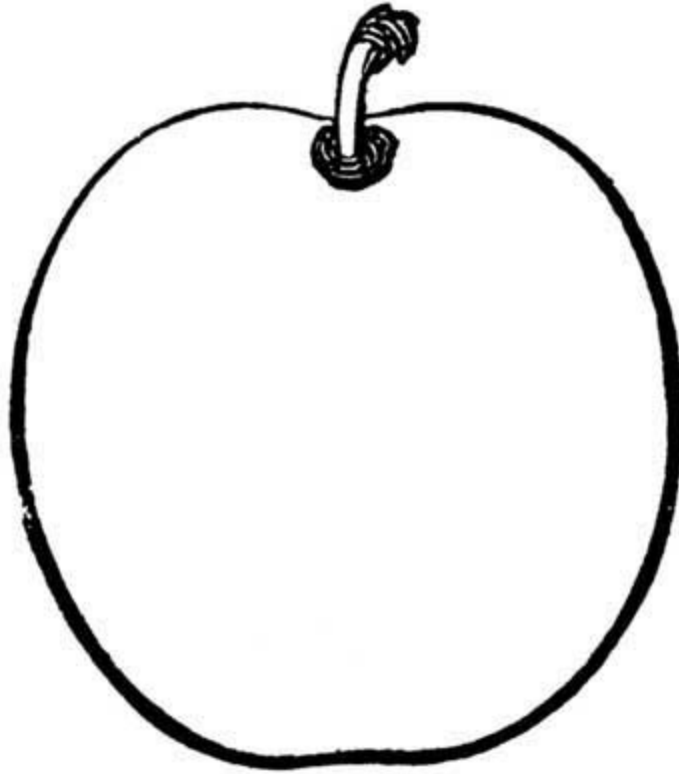


(1) *Curculio*, in the beetle-form, life-size. (2) Its assumed form when disturbed or shaken from the tree.

(3) Larva, or worm, as found in the fallen fruit. (4) Pupa, or chrysalis state, in which it lives in the ground.

Many remedies are proposed: making pavements, or keeping the ground hard and smooth, under the trees; pasturing swine and keeping fowls in the plum-orchard; syringing the whole tops of the trees four or five times with lime and salt water, or lime and sulphur-water—the proportions are not material, provided it be not excessively strong. It is recommended to apply with a garden-syringe. But, as few cultivators will have that instrument, they may sprinkle the mixture on the trees in any way most convenient. Salt, worked into the soil under plum-trees, is said to destroy this insect in its pupa state. At any rate, the salt is a good manure for the plum-tree. We know a remedy for the ravages of the curculio, unfailing in all seasons and localities—that is, to kill them: spread a cloth under the tree, and with a mallet having a head, covered with India-rubber or cloth that it may not injure the bark, strike the body and large limbs sudden blows, which will so jar them as to cause the insects to fall upon the cloth, and you can then burn them. Do this five or six times in the season, commencing when the fruit begins to set, and continuing till it becomes nearly full-grown. This is best done in the cool of the morning, while the insects are still; their habits of fear and quiet, when there is a noise about, are greatly in favor of their destruction by this method. This is somewhat laborious, but is a sure remedy, and will pay well in all plum-orchards, large or small. After two or three years of this treatment, there will be few or none of those insects left.

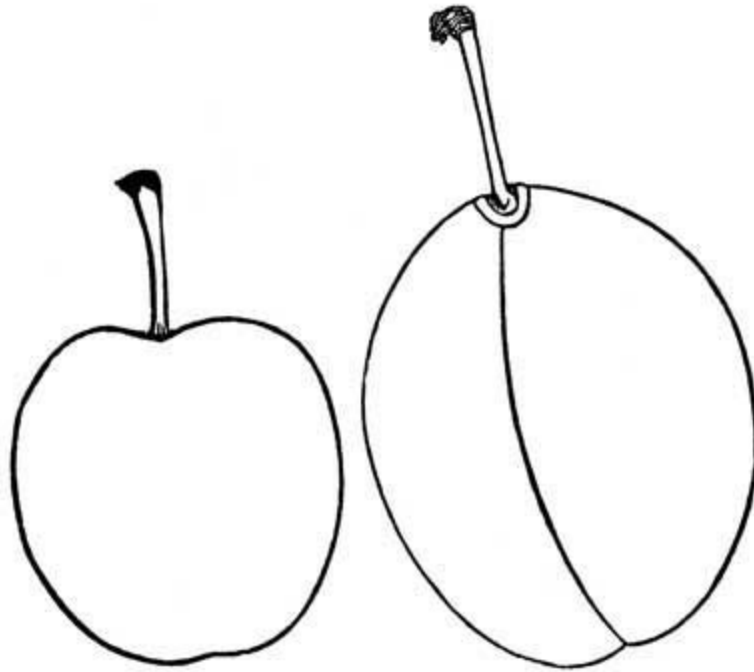
Uses of the plum are various. The fine varieties, well ripened, are a good dessert-fruit; for sweetmeats and tarts they are much esteemed; they are one of the better and more wholesome dried fruits. The foreign ones are called prunes, and are an article of commerce. With a little care, we can raise much better prunes than the imported. Like all fruits, they are better for quick drying by artificial heat. The French prunes, the process of drying which is minutely described by Downing in his fruit-book, are no better than our best varieties, quickly dried by artificial heat in a dry house, or moderately-heated oven. All dried fruit is much better for having become perfectly ripe before picking. It is a great mistake to suppose unripe fruit will be good dried.



Lawrence's Favorite.

Varieties are numerous, and many of them ought to be forgotten, as is the case with all other fruits. We give a small list, containing all the good qualities of the whole:—

Bleecker's Gage.—A hardy tree and sure bearer. Time, August.



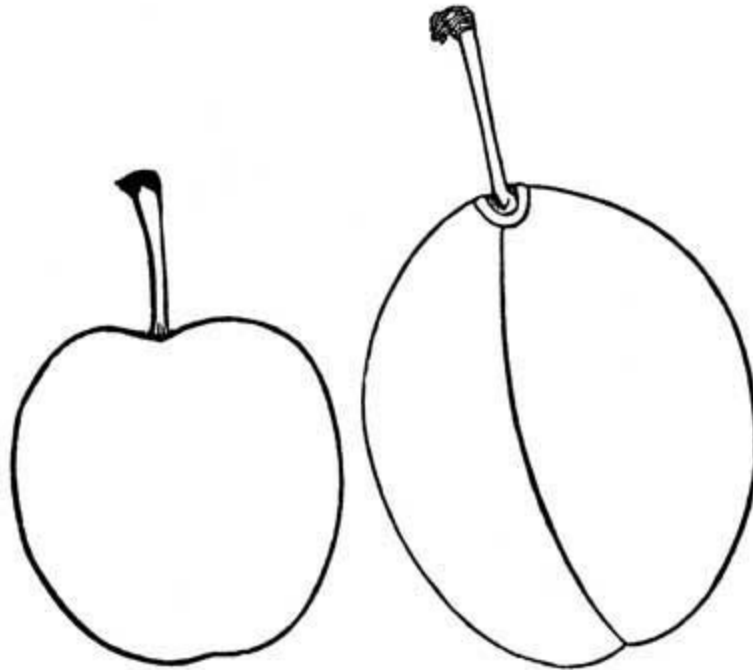
Imperial Gage. Egg.

Imperial Gage.—This is an American variety. It is of a lightish-green color, and excellent flavor. Season, July at the South, and September at the North.

Egg.—The above cut represents one of the egg-plums, of excellent quality in all respects. There are many of this name.

Lawrence's Favorite.—This is a fine plum, of the gage family. It was raised from the seed of the green gage; its qualities are seldom surpassed.

Washington.—This is a very good plum for high latitudes. At the South it is too dry.



Green Gage. Jefferson.

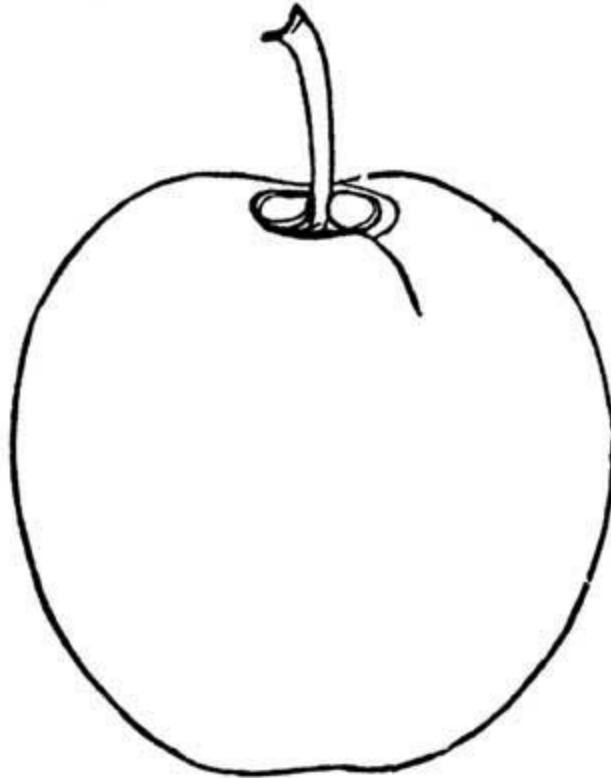
Green Gage.—With fifteen synonyms. Excellent.

Jefferson.—One of the very best. Time, last of August.

Denniston's Purple, or Red.—Vigorous grower and very productive. Time, August 20.

Madison.—A hardy, productive, and excellent October plum.

The foregoing varieties, with the little black damson-plum, so hardy and productive, and so much esteemed for preserving, will answer all needful purposes. You will find long lists in the fruit-books. Some of them are the above varieties, under different names. Procure four or five of the best you can find in your vicinity, and cultivate them, and you will need no others.



Washington.

POMEGRANATE.

This is one of the most delicious and beautiful of all the dessert-fruits. Native in China, and much cultivated in Southern Europe. It will do quite well as far north as the Ohio river. Trained as an espalier, with protection of straw or mats, it will do tolerably well throughout the Middle states. The fruit is about as large as an ordinary apple, and has a tough, orange-colored skin, with a beautiful red cheek. The tree is of low growth. Blossoms are highly ornamental, as is also the fruit, during all the season. It is cultivated as the orange.

There are several varieties: the *sweet-fruited*, the *sub-acid*, and the *wild* or *acid-fruited*. The first is the best, and the second the one most cultivated in this country; the latter yields a very pleasant acid, making an excellent sirup. Pomegranates should be extensively cultivated at the South, and form an important article of commerce for Northern cities.

POTATO.

This is far the most valuable of all esculent roots; supposed to be a native of South America. It is called the Irish potato, because it was grown extensively first in Ireland. It was first planted on the estate of Sir Walter Raleigh in 1602. It was introduced into England in 1694. It has been represented as having been introduced into England from Virginia as early as 1586, but attracted no attention, and for two centuries formed no considerable part of British agriculture. It has become naturalized in all temperate regions, and in many locations in high latitudes. In tropical climates, it flourishes on the mountains, at an elevation sufficient to secure a cool atmosphere. Cool moist regions, as Ireland and the northern parts of the United States, are most favorable for potatoes. In warm climates the potato grows less luxuriantly, yields much less, and is liable to be ruined by a second growth. In the latitude of southern Ohio, a severe drought, while the tubers are small, followed by considerable rain, causes the young potatoes to sprout, and send up fresh shoots, and often make a very luxuriant growth of tops, to the complete ruin of the tubers. This is called second growth. In cooler climates this second growth simply makes prongs on the tubers, thus injuring the appearance and quality, but increasing the crop. The only preventive is watering regularly in a dry time. This can be done advantageously in a garden, and on a small scale. In field culture, when second growth occurs, dig your potatoes at once, if they are large enough to be of much use. If not they will all be lost.

Propagation is by annually planting the tubers. No mixture of sorts ever takes place from planting different varieties together. This can only be done in the blossoms, and will consequently appear in young seedlings. To raise good potatoes, always plant ripe seed, and the largest and best, and leave them whole. Selecting small potatoes for seed, and cutting them up, and planting mere eyes and pearings as some do, has done much to injure the health, quality, and quantity of yield of the potato. Selecting the poorest for seed, will run out anything we grow in the soil. *New varieties* have been multiplying within the past few years from seed. Some gentlemen are raising varieties by thousands. Not more than one out of a thousand prove truly valuable. The quality of a new variety can not be established earlier than the fifth year. Many that promised well at first proved worthless.

To raise from seed, gather the balls after they have matured, hang them in a dry place till they become quite soft, when separate the seeds and dry them as others, and plant as early as the temperature of the soil favors vegetation.

Chance varieties from seed of balls left to decay in the fall, as tomatoes, are recorded. Probably our present best varieties had such an origin. Raising new varieties requires much care and patience. Keep each one separate, plant only the best, and then you must wait four or five years to determine whether, out of a thousand, you have one good variety.

Varieties.—These are numerous. Those best adapted to one locality, are often inferior in another. That excellent potato, the Carter, so firm in New England and western New York, is ill-shapen and inferior in many localities in Illinois. The Neshannock or common Mercer produces a larger yield in Illinois than in the Eastern states, but of a slightly inferior quality. Most seeds do better transported from a colder to a warmer climate, but with the potato the reverse is true. The best potatoes of Ireland are usually inferior in the warmer latitudes of this country. In ordering potatoes for seed it is better to describe the quality than to order by the name. We omit any list, of even the best varieties. They are known by different names, and are not equally good in all localities. And all varieties are scattered over the whole country, very soon, by dealers, and through the agency of agricultural societies and periodicals. Different varieties should be kept separate, as they look better for market, and no two will cook in precisely the same time.

Plant the large potatoes and plant them whole. From a small eye or a small potato to the largest they will vegetate equally well. And in a wet, cool season, the small seed will produce nearly as good a crop as the large. But the large seed matures earlier, and in a dry season produces a much larger crop. The moisture in a large potato decaying in the hill, is of great use to the growing plants, in a dry season. It is also generally conceded that potatoes growing from cut seed are more liable to be affected by the rot.

Quantity of seed per acre.—The practices of farmers vary from five to twenty bushels. It takes a less number of bushels per acre when the seed is cut. The quantity is also affected by the size of the seed, the larger the potatoes the more will it take to seed an acre.

Plentiful, but not excessive, seeding is best. It is a universal fact that you can never get something for nothing. Hence light seeding will bring a light yield. We think it best to put one good-sized potato in a place and make the rows three feet apart each way. We think they yield better than at any other

distances or in any other way. We have often tried drills, and found them more trouble, with no greater yield. The soil should be disintegrated to the depth of sixteen inches and the potatoes planted four inches deep, and cultivated with subsoil plow, and other suitable tools, in a manner to leave the surface nearly flat. Hilling up potatoes never does any good. We advise always to harrow the crop, as soon as they begin to appear through the soil.

Soil.—Any good rich garden soil is good for this crop, provided it be well drained. Potatoes like moisture, but are ruined by having water stand in the soil. New land and newly broken-up old pastures are best.

Manures.—All the usual fertilizers are good for potatoes, but especially ashes and plaster. The application above all others, for potatoes, is potash. Dissolve it in water, making it quite weak, and saturate your other manures with it, and the effect will always be marked. The tops contain a great deal of potash, and should always be plowed in and decay in the soil where they grow, otherwise they will rapidly exhaust the land. It is supposed that nothing will do more to restore the former vigor and health of the potato than a liberal application of potash in the soil in which they grow. The crop will be much increased in a dry season by manuring in the hill, dropping the potato first and putting the manure on the top of it.

Gathering and Preserving.—The usual hand-digging with hoe or potato-fork are well known, and do well when the crop is not large. But for those who grow potatoes for market, it is better to employ the plow in digging. Modern inventions for this purpose can everywhere be found in the agricultural warehouses. Potatoes are well preserved in a good cool cellar, in boxes or barrels; and are better for being covered with moist sand. The usual method of burying them outdoor is effectual and safe, if they be covered beyond the reach of frost, and have a small airhole at the apex, filled with straw.

The Potato Disease.—This is altogether atmospherical. A new piece of land was cleared for potatoes. In the middle was a close muck, on a coarse, gravelly subsoil. In the lowest place a ditch was dug, to carry off the superabundance of water; from that ditch the coarse gravel was thrown out on one side, and suffered to remain at considerable depth. Only two or three rods distant, on one side the plat extended over a knoll of loose sand. Potatoes were planted, from the same seed, at the same time, and in the same manner,

on these three kinds of land, side by side. They were all tended alike, needing little hoeing or care, the land being new. The rot prevailed badly that season. On digging the potatoes, it was found that in the coarse gravel, where the air could circulate almost as freely as in a pile of stove-wood, all the potatoes were rotten: on the muck, which was unlike a peat-bog, very fine and tight, almost impervious to the atmosphere, they were nearly all sound; on the sand, which was quite open, but tighter than the gravel, part were decayed and the rest sound. Their condition was graduated entirely by the condition of the soil. It is an apparent objection to this theory, that when the rot prevails, the best potatoes are raised on light, sandy soils. It is said that they are open to the action of air. To this it is replied, that whether they rot or not, in sandy soils, depends on the kind of sand. On some sand they rot very badly, on others hardly at all. Sandy soils differ very materially: some are almost pure silex; while others are filled with a fine dust, and, although apparently loose, are much more nearly impervious to the air than heavier soils; on the former, nearly all will decay, and on the latter, most will be preserved.

Look at the immense potato crops near Rochester, N. Y., on sandy land. We have personally examined it, and find it to be filled with dust, that excludes the air, and saves the potato from rot. Why, then, is a heavy clay useless for potatoes? Is not clay a very tight soil? Unbroken it is; but, when plowed, it is always left in larger particles than other land—it is but seldom pulverized. The spaces between the particles are all open to the free action of the air; hence, instead of being close, it is one of the most open of all our soils. This confirms the theory.

The influence of manuring land is still another confirmation. We are directed not to manure our land for potatoes when the disease prevails. It is said we can raise no sound potatoes on rich land when the rot is abroad. This is an error. The richness of the soil does not promote the disease; but if any kind of manure be applied that, from its bulk and coarseness, keeps the soil open to the air, the potatoes will rot. But fertilize to the highest extent, in any way that does not make the soil too open, and let in the air, and the crop will be greatly increased with perfect safety. Thus, this theory, like every truth, perfectly fits in all its bearings.

There is, then, no perfect remedy for the disease but in the power of Him who can purify the atmosphere. Numerous remedies and preventives have been

recommended, by those who suppose they have tried them with success. But in other localities and soils, all their remedies have failed, as will all others that will yet be discovered. A careful examination of the texture of the soils, upon the principles here indicated, and a repetition of their experiments, will show the discoverers that their success depended upon their soils, while others failed in using the same remedies on other soils. The practical uses of this theory are obvious. When the disease is abroad, we should select soil that excludes, as much as possible, the atmosphere, and plant *deep*; on all land not liable to have water stand on the subsoil. Do not be deceived into the belief that all sandy land will bear good potatoes, in the seasons when the disease prevails. The worst rot we ever had was in 1855, on very sandy land. This year (1857) we have witnessed the worst rot in open sand and gravel. Add to this, great care in preserving the health of the tubers. Plant very early, only whole potatoes, and of mature growth, thoroughly ripe; apply a little salt and lime, plaster rather plentifully, and potash, or plenty of wood-ashes—and you will succeed in the worst of seasons.

PRESERVING FRUITS, &c.

The essentials in preserving fruits, berries, and vegetables, during the whole year, are, a total exclusion from atmospheric action, and, in some vegetables, a strong action of heat. We have a variety of patent cans, and several processes are recommended. The patent cans serve a good purpose, but, for general use, are inferior to those ordinarily made by the tinman. The patent articles are only good for one year, and are used with greater difficulty by the unskilful. The ordinary tin cans, made in the form of a cylinder, with an orifice in the top large enough to admit whatever you would preserve, will last ten years, with careful usage, and they are so simple that no mistakes need be made. It is usually recommended to solder on the cover, which is simply a square piece of tin large enough to cover the orifice. Soldering may be best for those cans that are to be transported a long distance, but it is troublesome, and is entirely unnecessary for domestic use. A little sealing-wax, which any apothecary can make at a cheap rate, laid on the top of the can when hot, will melt, and the cover placed upon it will adhere and cause it to be air-tight. All articles that do not part with their aroma by being cooked, may be perfectly preserved in such cans, by putting them in when boiling, seasoned to your taste, and putting on the covers at once. The cans should be

full, and set in a cool place, and the articles will remain in a perfect state for a year. The finest articles of fruit, as peaches and strawberries, may be preserved so as to retain all their peculiar aroma, by putting them into such cans, filled with a sirup of pure sugar, and placing the cans so filled in a kettle of water, and raising it to a boiling heat, and then putting on the cover as above; the heat expels the air, and the cover and wax keep it out. Stone jugs are used for the same purposes, but are not sufficiently tight to keep out the air, unless well painted after having become cold. Wide-mouthed glass bottles are excellent. But, in using glass or stone ware, the corks must be put in and tied at the commencement, leaving a small aperture for the escape of steam, and the process of raising the water to a boiling heat must be gradual, requiring three or four hours, or the bottles will be broken by sudden expansion. Make the corks air-tight by covering with sealing-wax on taking from the boiling water. Some vegetables, as peas, beans, cauliflowers, &c., need considerable boiling, in order to perfect preservation. Tin cans may stand in the water and boil an hour or two, if you choose, and then be sealed. The bottles should be corked tight, have the cork tied in, and then be immersed and boil for an hour: take them out, and dip the cork and mouth of the bottles in sealing-wax, and all will be safe.

By one of these processes, exclusion of the atmosphere and thorough boiling, we may preserve any fruit or vegetable, so as to have an abundance, nearly as good as the fresh in its season, the whole year, and that at a trifling expense. All fruits and vegetables may also be preserved by drying. By being properly dried, the original aroma can be mostly retained. The essentials in properly drying are artificial heat and free circulation of the air about the drying articles. Fruit dried in the sun is not nearly so fine as that dried by artificial heat. An oven from which bread has just been taken is suitable for this purpose; but a dry-house is better. A tight room, with a stove in the bottom, and the fruit in shallow drawers, put in from the outside, serves a good purpose. Construct the room so as to give a draft, the heated air passing out at the top, and the process of drying will be greatly facilitated, and the more rapid the process, without cooking the fruit, the better will be its quality. This process is applicable to all kinds of vegetables. Roots, as beets, carrots, parsnips, or potatoes, should be sliced before drying. The object in drying the latter articles would be to afford the luxury of good vegetables for armies and ships' crews, in distant regions, and in climates where they are not grown.

Milk can be condensed and preserved for a long time, and, being greatly reduced in quantity, it is easily transported. It is not generally known in the country that Mr. Gail Borden, of New York, has invented a method of condensing milk, fresh from the cow, so that it will perfectly retain all its excellences, including the cream, and by being sealed up in tin cans, as above, may be kept for many months. The milk and the process of condensation have been scientifically examined by the New York Academy of Medicine, and pronounced perfect, and of great value to the world. We have used the condensed milk, which was more than a month old; it had been kept in a tin can without sealing and without ice, but in a cool place. It was sweet and good, differing in no respect from fresh milk from the cow, except that the heat employed in condensing it gave it the taste of boiled milk. If kept in a warm place, and exposed to the atmosphere, it may sour nearly as soon as other milk: but it may be sealed up and kept cool so as to be good for a long time. The condensation is accomplished by simple evaporation of the watery part, in pans in vacuo. No substance whatever is put into the milk. Four gallons of fresh milk are condensed into one. When wanted for use, the quantity desired is put into twice the quantity of water, which makes good cream for coffee; or one part to four of water makes good new milk; and one part to five or six makes a better milk than that usually sold in cities. Steamers now lay in a supply for a voyage to Liverpool and return, and on arrival in New York, the milk is as good as when taken on board. The advantages will be numerous. Such milk will be among regular supplies for armies and navies, and for all shipping to distant countries. All cities and villages may have pure, cheap milk, as the condensation will render transportation so cheap that milk can be sent from any part of the country where it is most plenty and cheapest. The process is patented, but will be granted to others at reasonable rates, by Borden & Co.; and eventually it will become general, when farmers can condense and lay by, in the season when it is abundant, milk for use in the winter, when cows are dry. This will make milk abundant at all seasons of the year, and plenty wherever we choose to carry it. It will also save the lives of thousands of children, in cities, that are fed on unwholesome milk or poisonous mixtures. There is no temptation to adulterate such milk, for the process of condensation is cheaper than any mixture that could be passed.

Preserving hams is effectually done by either of the following methods. After

well curing and smoking, sew them up in a bag of cotton cloth, fitting closely, and dip them into a tub of lime-whitewash, nearly as thick as cream, and hang up in a cool room. This is a good method, though they will sometimes mould. The other process, and the one we most recommend, is to put well cured and smoked hams in a cask, or box, with very fine charcoal; put in a layer of charcoal, and then one of hams; cover with another layer of coal and then of hams, and so on, until the cask is full, or all your hams are deposited. No mould will appear, and no insect will touch them. This method is perfect.

Another process, involving the same principles as the preceding, is to wrap the hams in muslin, and bury them in salt. The muslin keeps the salt from striking in, and the salt prevents mould and insects.

PUMPKIN.

There are some five or six varieties in cultivation. Loudon says six, and Russell's catalogue has five. The number is increasing, and names becoming uncertain. Certain varieties are called pumpkins by some, and squashes by others. The large yellow Connecticut, or Yankee pumpkin, is best for all uses. The large cheese pumpkin is good at the South and West. The mammoth that has weighed as high as two hundred and thirty pounds, is a squash, more ornamental than useful. The seven years' pumpkin is a great keeper. It has doubtless been kept through several years without decay. Pumpkins will grow on any good rich soil, but best on new land, and in a wet season. Do best alone, but will grow well among corn and better with potatoes. A good crop of pumpkins can seldom be raised, two years in succession, on the same land. Care in saving seed is very important. The spot on the end that was originally covered by the blossom, varies much in dimensions, on pumpkins of the same size. Seeds from those having small blossom-marks, bear very few, and from those having large ones, produce abundantly.

They are good fall and winter feed for most animals. They will cause hogs to grow rapidly, if boiled with roots, and mixed with a little grain. Fed raw to milch cows and fattening cattle, they are valuable. Learn a horse to eat them raw, and if his work be not too hard, he will fatten on them. They may be preserved in a dry cellar, in a warm room as sweet potatoes, or in a mow of

hay or straw, that will not freeze through. But for family use they are better stewed green, and dried.

QUINCE.

This fruit, with its uses, for drying, cooking, marmalades, flavors to tarts and pies made of other fruits, and for preserving as a sweetmeat, is well known and highly esteemed.

The quince is rather a shrub than a tree. It should be set ten feet apart each way, in deep, rich soil. It needs little pruning, except removing dead or cross branches, and cutting off and burning at once, twigs affected with the insect-blight, as mentioned under pears. The soil should be manured every year, by working-in a top-dressing of fine manure, including a little salt.

Propagation—is by seeds, buds, or cuttings. Budding does very well. Seedlings are not always true to the varieties. Cuttings, put out early and a little in the shade, nearly all take. This is the best and easiest method of propagation.

There are several varieties; the *apple-shaped*, *pear-shaped*, and the *Portugal*, are the principal.

The apple-shaped, or orange quince (and perhaps the large-fruited may be the same) is, on the whole, the best of all. Early, a great bearer, and excellent for all uses. The pear-shaped is smaller, harder, and later. It may be kept longer in a green state, and therefore be carried much farther. The only reason for cultivating it would be its lateness and its keeping qualities. The Portugal quince is the finest fruit of all, but is such a shy bearer as to be unprofitable. The *Rea quince* is a seedling raised by Mr. Joseph Rea, of Greene county, New York, and is pronounced by Downing "an acquisition." The fruit is very handsome, and one third larger than the common apple or orange quince. The tree is thrifty, hardy, and productive. It is a valuable modification of the apple-shaped or orange quince, superior to the original. Such varieties may be multiplied and improved, by new seedlings and high cultivation.

RABBITS.

To prevent rabbits and mice from girdling fruit-trees in winter, is very important to fruit-growers. The meadow-mouse is very destructive to young trees, under cover of snow. Rabbits will girdle trees after the green foliage on which they delight to feed is gone. Take four quarts of fresh-slaked lime, the same quantity of fresh cows' dung, two quarts of salt, and a handful of flour of sulphur; mix all together, with just enough water to bring it to the consistency of thick paint. At the commencement of cold weather, paint the trunks of the trees two feet high with this mixture, and not a tree will suffer from rabbits or mice. Treading own the snow does good, but it is very troublesome, and not a perfect remedy. Experience has never known the foregoing wash to fail.

RADISH.

This is a well-known root, eaten only raw, and when young and tender. A rich sandy soil is best. Like most turnips, the roots are more tender and perfect when grown in rather cool weather; hence, those grown in early spring are better than a summer growth. They do well in an early hotbed.

The *Scarlet* and *White Turnip-rooted* are fine for early use. They are always small, but fair, and very early.

The *Scarlet Short-top* comes next, and is a very fine variety. These may be had through the whole season, by sowing at proper intervals; hence, others are unnecessary. Other good varieties are the *Summer*, or *Long White Naples*; *Long Salmon*, a large, gray radish, not generally described in the books (a splendid variety in southern Ohio); and the *Black Spanish* for fall and winter use. This grows large like a turnip, and is preserved in the same way. The best method of guarding against worms is to take equal quantities of fresh horse-manure and buckwheat-bran, and mix and spade them into the bed. Active fermentation follows, and toadstools will grow up within forty-eight hours, when you should spade up the bed again and sow the seed; they will grow very quickly, be very tender, and entirely free from worms.

Radish-seed is sown with slow-vegetating seeds, as carrots, beets, parsnips, &c. The radishes mark the rows, so that they may be cleared of weeds, and the ground stirred before the plants would otherwise be discernible, and also shade the germinating seeds and the young plants from destruction from a hot

sun. The radishes may be pulled out when the main crop needs the ground and sun. For this purpose the scarlet short-top variety is used, because the long root loosens the soil in pulling; and as the crown stands so much above the surface, they may be crushed down with a small roller, and thus destroyed without the labor of pulling. Sowing radish-seed among root-crops, and cultivating early with a root-cleaner, an acre of roots can be raised with about the same labor as an acre of corn.

RASPBERRY.

The common black raspberry we have noticed elsewhere as one of the most profitable in cultivation. The other varieties, worthy of general cultivation, are the Franconia, the Fastollf, the red, and the white or yellow Antwerp. Any good garden-soil is suitable for raspberries. It should be worked deep, and have decayed wood and leaves mixed with barnyard manure and wood-ashes. In all but very cold latitudes, raspberries should be planted where they may be a little shaded. None of the finer old varieties produce a good crop of fruit without winter-protection. The canes may live without it, but will bear but little fruit. The best method of protection is to bend down the canes at the beginning of winter, before the ground freezes, and cover them lightly, with the soil around them. They should first have some well-rotted manure put around the canes. Stools should be four feet apart, and have about five or six canes in a stool. Cut away the rest. The best of all manures for raspberries is said to be spent tan-bark. Put it around in the fall to the depth of two inches; work it into the soil in the spring, and put around fresh tan-bark, to the same depth.

The varieties for general cultivation are few. The common black is one of the best. The common wild American red, native in all the Middle and Eastern states, is greatly improved by cultivation. As it is perfectly hardy, and a great and early bearer, it should have a place in every collection. The Franconia is a fine fruit, and, among those generally cultivated, occupies the first place. The yellow Antwerp is fine-flavored and good-sized, but too soft for a general market-berry. The same is true of the Fastollf. The red Antwerp is good, but quite inferior to the new red Antwerp, or Hudson River Antwerp. The Ohio Evergreen is a new variety, hardy, prolific, and a long bearer, fine fruit in considerable quantities having been picked on the 1st of November. On this

account, it should be in every garden. There are two kinds of red raspberries brought to notice by Mr. Lewis P. Allen, of Black Rock, N. Y., that deserve extensive cultivation, if they warrant his recommendation. Mr. Allen says he has cultivated them for a number of years, and, with no winter protection, they have borne a large crop of excellent fruit every year, pronounced by dealers in Buffalo market superior to any other variety. Should these varieties prove equally good elsewhere, they deserve a place in every garden in the land.

RHUBARB.

There are several varieties of rhubarb now in cultivation.

The Victoria, Mammoth, and Scotch Hybrid, all of which (if they be really distinct) are fine and large, under proper culture. There is much of the old inferior kind, which generally affords only small short leaves, and which is of no value, compared with the large varieties. The method of growing is very simple, and yet the value of the plant depends mainly on right cultivation.

Propagation is by seeds, or by dividing the roots. By seed is preferable. The idea that the largest kinds will not produce seed is incorrect. We raised four or five quarts of seed from a single plant of the largest variety, in one season. Young plants are suitable for transplanting after the first year's growth. They should be set three feet apart each way. The soil should be thoroughly enriched and trenched two feet deep, with plenty of well-rotted manure in the bottom, and mixed in all the soil. Plant the crowns two or three inches below the surface to allow stirring the ground in the spring, without injury. After this they will only want enriching with well-rotted manure in rather liberal quantities, worked in with a fork in the fall or spring. Covering up with manure in the fall is good. Those who raise the largest leaves, lay bare the crowns in spring, and with a sharp knife, remove all the smaller crown-buds. The leaves will be greatly reduced in number, but increased in size. We have often seen a single stem of a leaf that weighed a full pound.

The roots live many years. We know a single root, in St. Lawrence county, N. Y., from which we ate pies and tarts twenty-two years ago, and which is now so vigorous as to yield more than a supply for two families through the season. The only care it has ever had, has been liberal supplies of well-rotted

manure. The seed stocks have generally been broken off. They should always be, unless you wish to raise seed, then save one or two of the strongest. New crowns come out on the sides, from year to year, until each plant will cover a considerable space. The one mentioned, as being twenty-two years old, has never been moved during the whole time. It is not the giant kind, but the leaves are large and long. Rhubarb has a better flavor and requires much less sugar, by blanching. This is best done by placing an old barrel, without a bottom, over the hill as it begins to grow. The leaves will grow long, with white tender stems. Use it when the leaves are half or full grown, as you please.

RICE.

This, in its value to the world as an article of food, is next to Indian corn. It is the main article of diet for one third of the human race. It is produced only in certain parts of the world, and its cultivation is so simple and easy, and so much a department of agriculture by itself, that we omit directions for growing it. The ravages of the rice-weevil, so destructive to rice lying in bulk, are prevented by the application of common salt, at the rate of half a pound to the bushel.

ROCKS.

We frequently find, on some of our best land, large boulders, very hard, and too large to be removed, with any team we can command, and which would be in the way, in any place to which we might remove them. The best way to get rid of them, when it can be afforded, is to burn or blast them into pieces small enough to be easily handled. When this can not be afforded, the best method is to make an excavation by the side of them, deep enough to let them sink below the reach of the plow, and allow them to fall in, being careful not to get caught by them.

ROLLER.

This is quite as indispensable to good farming and gardening as any other tool. It serves a great variety of useful purposes. The first is to pulverize soils.

No man can get a full crop on a soil not made fine on the surface, however rich that soil may be. It is often the case that land needs rolling two or three times before the last harrowing and sowing the seed. Another purpose is, on all light soils, to place the soil close around the seeds after they have been covered. When this is not done, seeds will vegetate very unevenly, and, in dry weather, some of them not at all. Another advantage of rolling a field-crop is the greater facility and economy with which it can be harvested. It makes a level, smooth surface, sinking small stones out of the way of the scythe or reaper. Rolling makes grass-seed catch, when sown with a spring-crop. All beds of small seeds—as onions, beets, carrots, parsnips, &c.—should be rolled after planting. It will so smooth the surface, that hoeing and cultivating can be done without injury to the plants. The rows are also much more easily seen while the plants are young. Any crop will grow better and larger by not being too much exposed to the action of the atmosphere on its roots. When the soil is coarse, part of the seeds and roots are greatly exposed to the action of the atmosphere, and this exposure is very irregular. The roller so crushes the lumps and fills up the openings in the soil as to cause the atmosphere to act regularly on the whole crop. Few farmers stop to think that the pressure of the atmosphere on their soils is fifteen pounds' weight on every square inch, and that, hence, the air must penetrate to a considerable depth into the soil; and where the soil is coarse, the air enters too freely, and acts too powerfully for the good of the plants. Rollers are made of wood, iron, or freestone. For most purposes, wood is best. A log made true and even, or, better, narrow plank nailed on cylindrical ends, are the usual forms. From eighteen inches to three feet in diameter is the better size. Iron or stone rollers, in sections, are best for pulverizing soil disposed to cake from being annually overflowed with water, or from other causes.

ROOT CROPS.

It is important that American farmers learn to attach much greater importance to the culture of roots. The potato is the best of all roots for feeding; but, as the yield has become so light in most localities, and the demand for it for human food has so greatly increased, it will no longer be grown extensively as food for animals. Farmers must, therefore, turn their attention to beets, carrots, and parsnips. Reasonable tillage will produce one thousand bushels to the acre of beets and carrots, and two hundred more of parsnips. These

roots, raw or cooked, are valuable for all domestic animals. A horse will do better on part oats and part carrots, or beets, than upon clear oats. For milch cows, young stock, and fattening cattle, and for sheep and fowls, they are highly valuable. With the facilities now enjoyed, they may be raised at a cheap rate. Plant scarlet short-top radish-seed in the rows, to shade the vegetating seed and young plants, and to mark the rows, to facilitate clearing and stirring the ground, while the plants are very young, and using the most approved root-cleaners, and the same amount of food can not be grown at the same price in any other crops.

SAFFRON.

This is a well-known medicinal herb, as easily grown as a bean or sunflower. It is principally used in eruptive diseases, to induce moisture of the skin and keep the eruption out. Sow in any good soil, in rows eighteen inches apart, and keep clean of weeds. When in full bloom, the flowers are gathered and dried.

SAGE.

This is a hardy garden-herb, easily grown. Its value for medicinal and culinary purposes is well known. It is propagated by seeds, or by dividing the roots. With suitable protection in winter, roots will live for a number of years, bearing seed after the first.

Varieties are, the *red*, the *broad-leaved*, the *green*, and the *small-leaved green*. The red is most used for culinary purposes, and the broad-leaved is most medicinal. All the varieties may be used for the same purposes. Any garden-soil, not decidedly wet, is suitable for sage. Raise new plants once in three or four years. Plants may be renovated, by certain culture and care, but it is better to grow new ones. Cut the leaves two or three times in the season, and dry quickly, and put away in paper bags; or, better, pulverize and cork up in glass bottles. This is the best method of preserving all herbs for domestic use.

SALSIFY, OR VEGETABLE OYSTER.

This is a hardy biennial vegetable, resembling a small parsnip, and as easily grown. When properly cooked, its flavor resembles the oyster, whence its name. Sow and cultivate as parsnips or carrots. It is suitable for use from November to May. It is better for being allowed to remain in the ground until wanted for use, though it may be well kept, in moist sand in the cellar. Care is necessary in saving seed as it shells and blows away like thistle seed, as soon as ripe. It must be sown quite thick, on account of its proneness not to vegetate. It should be more extensively cultivated.

SCRAPING LAND.

This is a process needed only on land that has not been under cultivation long enough to become level. All new land has many knolls of greater or less size. As soon as the roots are out sufficiently to allow it, the knolls should be plowed and leveled with a common scraper. Most farmers neglect it as injurious to the soil, and too expensive. But when we consider that rough land never gets well plowed, and that the gradual wearing away of the knolls will continue their unproductiveness for a number of years, it will be seen that the cheapest way is to plow and scrape the land level at once, and thoroughly manure the places from which the soil has been scraped.

SEEDS.

The best of everything should be saved for seed. Peas, beans, corn, tomatoes, &c., should not be gathered promiscuously, finally preserving the last that matures, for seed. Leave some of the finest and earliest stocks, and from them save seed, not from the first or the last that matures, but from the earliest that grows large and fair. Save tomato-seed from those that grow largest, but near the root. Gather all seeds as soon as mature, as remaining exposed to the weather is unfavorable to vegetation. Dry in a warm place in the shade, but not too near a stove or fire. Keep in paper bags, hung in a dry airy place, beyond the reach of mice.

Trying the quality of seeds is important, as it may save loss and disappointment, from sowing seeds that will not vegetate. A little cotton wool or moss in a tumbler containing a little water, and placed in a warm room, will afford a good means of testing seeds. Seeds placed on that wool, will

vegetate sooner than they would do in the soil. But a more speedy, and generally sure method, is by putting a few seeds on the top of a hot stove. If they are good they will crack like corn in parching; otherwise they will burn without noise, and with very little motion. The improvement or declension of fruits, grains, and vegetables, depend very materially upon the manner of gathering and preserving seeds. Gather promiscuously and late, and keep without care, and rapid declension will be the result. Gather the earliest and best, and plant only the very best of that saved, and constant improvement will be secured.

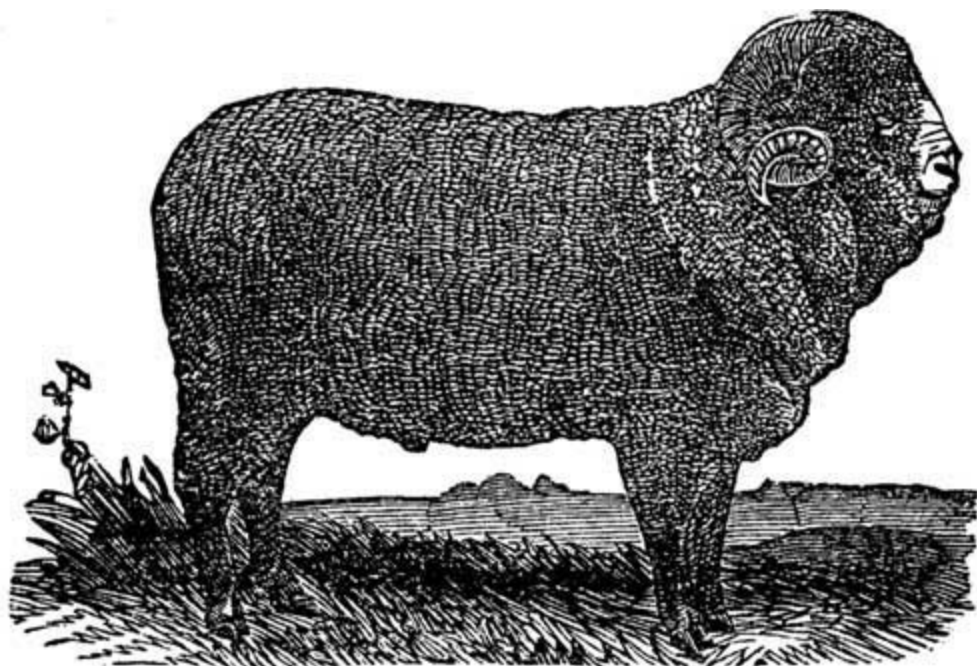
SHEEP.

These are the most profitable of all domestic animals. The original cost is trifling, and the expense of raising and keeping is so light, and the sale of meat, tallow, hide, and wool, is so ready, that sheep-growing is always profitable. So important has this always been considered, that in all ages of the world, there have been shepherds, whose sole business it has been to tend their flocks. Were the flesh of sheep and lambs more extensively substituted for that of swine, in this country, it would be equally healthy and economical. American farmers do not attach to sheep-growing half the importance it deserves. We recommend a thorough study of the subject, in the use of the facilities afforded by the writings of practical men. We can only give the outlines of the subject in a work like this. A theory has been scientifically established by Peter A. Brown LL. D. of Philadelphia, in which it is shown that all sheep are divided into two species, Hair-bearing and Wool-bearing. These species crossed, produce sheep that bear both wool and hair, as the two never change. The hair makes blankets that will not shrink. The wool is good for making fulled cloth. Blankets made from the fleeces of sheep that are the product of the cross of these two species, will shrink in some places and not in others, just as the hair or wool prevails. It is also true that the hair-bearing sheep delight in low, moist situations and sea-breezes, while the wool-bearing sheep does best on high, airy, and dry land. These fleeces all pass as wool, but the microscope shows a marked and permanent difference, and one can easily learn to distinguish it at once, by the touch and with the naked eye. This is thrown out here to induce a thorough examination of the whole subject. There are three staples of wool, short, three inches long, middling, five inches, and long, eight inches. Varieties of sheep are numerous. We shall

only mention a few. The question of the best breeds has been warmly controverted. We have no disposition to try to settle it. The question of the best variety must depend upon locality and design. If the wool is the object, then the Vermont Merino for the North, and the pure Saxony for the South, are evidently the best. If located near large cities, where the flesh is the main object, then the large-bodied, long-wooled breeds are much preferable. Among those much esteemed we note the following:—

The *Cotswold* mature young, and the flesh will vary in weight from fifteen to thirty pounds per quarter. The *New Leicester* is less hardy than the Cotswold, but heavier, weighing from twenty-four to thirty-six pounds per quarter. The *Teeswater sheep*, improved by a cross with the Leicester, is considered valuable. The *Bampton* is one of the very best grown in England. Fat ewes average twenty pounds per quarter, and wethers from thirty to thirty-five pounds. The *Sussex, Hampshire, and Shropshire* varieties of the Down sheep, are all highly esteemed. The *Leicester* are very valuable. An ordinary fleece weighs from three to five pounds. Mr. Joseph Beers of New Jersey had one that sheared thirteen pounds at one time, and the live weight of the sheep was 378 pounds.

There are *French, Silesian, and Spanish Merinoes*, much esteemed in Vermont and elsewhere. The average weight of a flock of ewes of French merinoes after shearing was 103 pounds. Their fleeces averaged twelve pounds and eight ounces. The fleece of one buck of the same flock weighed twenty pounds and twelve ounces.



The French Merino Ram.

The *Silesian Merinoes* are smaller, but produce beautiful fleeces. In a flock of nineteen ewes, the average weight of fleece was seven pounds and ten ounces, and that of the buck weighed ten and a half pounds.

A large flock of *Spanish Merinoes* yielded an average of a little over five pounds of well-washed wool. All these varieties are valuable for wool. The wool of the pure Saxony sheep, however, is best.

The *Tartar sheep*, called also Shanghae and Broadtail, is a recently-imported breed, of great promise for mutton. Their fleece is a fine silky hair, making fine blankets that will not shrink, but not good for fulled cloths. The ewes are remarkably prolific, producing sometimes five lambs at a time, and often twice a year. One ewe bore seven lambs in one year, all living and being healthy. The flesh is of the highest quality. This may stand at the head of all our sheep as a market animal. The cross of this with our common sheep has proved fine. They need to be further tested in this country. A new kind of sheep has also been imported from Africa, within a few years; a variety unknown to naturalists, but having some points in common with the Tartar sheep.

Diseases of Sheep.—There are several that have been very troublesome, but which experience has enabled us to cure. *Scours* is often very injurious. A

little common soot from the chimney, or pulverized charcoal, is a sure remedy. Mix it with water, not so thick as to make it difficult to swallow, and give a teaspoonful every two hours, and relief will soon be experienced.

Water in the head is a disease caused by long exposure to wet and cold. This is prevented by a small blanket on the back of the sheep. The wool on the backs of sheep will be seen to be often parted, exposing the skin. Water falling on the back will penetrate the wool and run down, and wet and chill the whole body. A small cotton blanket, fifteen inches wide, and long enough to reach from the neck to the tail, fastened to its place by tying to the wool, and painted on the outside, will cause all the water to run off, saving the health of the sheep, and causing him to require less food. In the cold, wet season, every sheep should have such a blanket; they would cost three or four cents each, and be worth many times their cost in the saving of feed for the animals. The more comfortable an animal is, the less food will he require. Applying tar above the noses of sheep at shearing, that they may be compelled to smell it and eat a little for a long time, is considered favorable to their general health, and a preventive of rot.

The foot-rot, in cattle, sheep, and hogs, is a prevalent disease. Boys walking the path, barefoot, where such diseased animals frequently pass, may contract the disease. This is always cured by washing in blue vitriol. Most cases are cured by one application, and the most confirmed by two or three. Make a narrow passage, where only one animal can pass at once. Put in a trough twelve feet long, twelve inches wide, and as many deep. Put in that fifty pounds of blue vitriol and fill with water, throwing a little straw over the top. Cause the diseased animals to pass through that, and they will be cured. This is thought to be an invariable remedy. If sheep do not appear healthy on lowland pasture, give them small quantities of fine charcoal and salt, and they will be as healthy as on the hills. A little salt for sheep is useful during the whole year. The health of sheep is injured more in fall than at any other season; they are very apt to be neglected at the beginning of winter. They grow poor rapidly when their green feed first fails; a little hay and grain and a few roots then will keep them up, prevent disease, and make it less expensive to keep them through the winter. Feed in racks or troughs, when they can not get their food under foot, and as far as practicable, under shelter, and in a warm place. It is much cheaper, and keeps the sheep much more healthy. They should have fresh water, where they can drink, two or three times a day.

Salt, mixed with wood-ashes and pulverized charcoal, should also be constantly within their reach. A few beets, carrots, or parsnips, are always valuable. Some green feed is very essential for ewes, for some time before the yearning season. Corn is good for fattening sheep; but, for increasing the wool, it is not half as valuable as beans. Good bean-straw is better than hay. Corn-fodder is excellent. The product of one and a half acres of land, sowed with corn, will winter, in fine condition, one hundred sheep—the corn sowed the 20th of June, and cut up after it has begun to lose its weight slightly, and shocked up closely, bound round the top with straw, and then allowed to stand till wanted for feeding. To have healthy sheep, do not use a ram under two, or over six or seven years old, and raise no lambs from unhealthy ewes or rams. The expense of keeping sheep, as all other animals, is much less when they are kept warm. Much feed is wasted in keeping up animal heat, which would be saved by warm quarters.

Sheep-manure is better than any other, except that of fowls. No other parts with its qualities by exposure so slowly. Some farmers save all labor of carting and spreading sheep-manure, by having movable wire fences, and putting their sheep on one acre for a few days, and then removing to another. One hundred sheep may thus be made to manure an acre of land in ten days, better than any ordinary dressing of other manure. We should prefer carefully collecting and saving it under cover, mixed with muck or loam, and apply where and when we choose. Keeping a suitable number of sheep on a farm is very important in keeping up the farm. A farm devoted to grain or vegetables, without a suitable number of animals, usually runs down.

The time when lambs should be allowed to come is important. We much prefer letting them come when they please, if we have warm quarters, and can take a little extra care of them. This will give a larger growth, and furnish large lambs for market, at a season of the year when they are most desired, and bring the greatest price. For those who will not take the necessary pains, let them come when the weather has become warm and grass plenty. Sometimes a ewe loses her lamb, and you wish her to raise one of another ewe's, that has two. To make a ewe own another's lamb, take off the skin of her dead lamb, and bind it on to the other lamb, and she will smell it and own the lamb; after which the skin may be removed.

Sheep-culture is a subject to which farmers should give increased attention,

until the average weight of sheep in the United States shall become one third greater than at present, and until there shall be ten sheep to one of all we have at present.

SHEPHERDIA OR BUFFALO BERRY.



This is an ornamental shrub, growing from six to fifteen feet high, bearing a roundish red fruit, much esteemed for preserves. Trees are of two kinds, male and female, one bearing staminate and the other pistillate flowers. Hence no fruit can be grown without setting out the trees in pairs from six to fifteen feet apart. If you set out only two, and they chance to be of the same kind, you will get no fruit.

SOILS.

The nature and management of soils must be measurably understood by any one who would be a thorough cultivator. The productive power of a soil depends much upon the character of the subsoil. A gravelly subsoil is, on the whole, the best. A thin soil lying on a cold clay subsoil—the hardpan of the East, and the crowfish clay of the West—however rich it may be, will be unproductive; while the same soil, on a gravelly subsoil, would produce abundantly. The best soils, for all purposes, are the brown or hazel-colored. Plowed in wet weather, they do not make mortar, and in dry weather they will not break in clods. Dark-mixed and russet moulds are considered the next best. The worst are the dark-gray or ash-colored. The deep-black alluvial soils of the Western prairies are an exception to all other soils, possessing, under proper treatment, great powers of production. Soils do not, to any considerable extent, afford food for plants. A willow-tree has been known to gain one hundred and fifty pounds' weight, without exhausting more than two or three ounces of the soil, and even that might have been wasted in drying and weighing.

In our article on manures, we have shown that it is the texture of soils, and their power to control moisture and heat, that renders them productive: hence, no soil can be poor that is stirred deep and kept in a friable condition, without being too open and porous; and no soil can be good that is hard and not retentive of moisture, without having water stand upon it. Hence, the great secret of successful farming, is, such a mixture of the soils, and of fertilizers with the soil, as shall keep it friable and moist, and such thorough drainage as will prevent water from standing so as to become stagnant, and to unduly chill the roots of growing plants. Nature has provided, near at hand, all that is essential to productiveness; all that is necessary is to properly mix them. We do not believe that there is an acre of land now under cultivation in the United States, in a latitude where corn will grow, on which we can not raise a hundred bushels of shelled Indian corn, without applying anything but what may be raised out of that soil, and procured in the shape of manure by animals in consuming that product. The poorest farm in America may be brought up to a state of great fertility, without applying one dollar's worth of any foreign substance. Plow *deep*, turn under all the green substances possible, and feed out the products on the farm and apply the manure, and mix opposite soils, that may be found in different localities. Three years will secure great productiveness, and the same course will increase its value, from year to year, without cost. Three things only are essential to convert poor land into the best; deep and thorough stirring and pulverization, suitable draining, and thorough mixture of soils of different qualities, and the incorporation of such animal and vegetable substances as can be produced on the land itself. We would not declare against foreign manures, but insist that the necessary ingredients are found, or may be manufactured near at hand. The philosophy of deep plowing and thorough pulverization is obvious. A fine soil will retain and appropriate moisture in an eminent degree, on the principle of capillary attraction, or as a sponge or a piece of loaf sugar will take up water. There is also room for excess of water to sink away from the surface, and return again when needed. It also affords room for the roots of plants. Such a soil also receives moisture from the atmosphere. The atmosphere also contains much water, and more in the heat of summer than at any other time. The air also, with a constant pressure of fifteen pounds to the square inch, enters to a considerable depth into the soil, and the deeper it is stirred, and the more thoroughly it is pulverized, the more it will enter. In coming in contact with the cool moisture below, it is condensed and waters the soil, on the principle

that a pitcher of cold water in a warm room has large drops of water on the outside; that water is a mere condensation of moisture in the atmosphere. The cool subsoil acts in the same way upon the atmosphere at night. A deeply disintegrated soil, also, seldom washes by rain. Shallow-plowed and coarse land sends off the water after a slight rain, while deep-plowed and thoroughly pulverized land retains it. The philosophy of manures involves the same principles. All the fertilizers act upon soils in such a manner as to render them fine, and open an immense surface to the action of the atmosphere, and form large reservoirs for moisture through their innumerable fine pores. Draining is to carry off an excess of water that would stand on an unfavorable subsoil. That water, on undrained land, causes two evils; it stagnates and renders plants unhealthy, and it is too cool, rendering land what we call cold. Thus, the deeper you plow land, and the finer you make it, the warmer it will be, and the more perfectly it will control moisture. Mixing soils by subsoiling, trenching, and deep plowing, and by carting on foreign substances, is wholly on this principle. Sand that drifts about with the wind is too light to retain moisture, and needs clay carted on. By this means the poorest white sand has often been converted into the most productive soil. Definite rules for this mixture of soils can not be safely given. The rules must differ in different localities and circumstances; it must, therefore, be determined by experiment. Analyzing soils is sometimes of use, but usually has too much importance attached. We do not advise farmers to study it. Let them try applications and mixtures, at first on a small scale: they will soon learn what is best on their farms, and may then proceed without loss. Some lands are of such a character that the carting on, and suitably mixing, the substances in which they are deficient, may cost as much as it did to clear the land of its original forest; but it will pay well for a long series of years. So well are we persuaded of the utility and correctness of these brief hints, that, in selecting a farm, we should regard the location more than the quality of the soil. The latter we could mend easily; while we should find it difficult to move our farm to a more favorable location. Poor land near a city or large town, or on some great thoroughfare, we should much prefer to good land far removed from market, or in an unpleasant location.

SPINAGE, OR SPINACH.

Both these names are correct; the former is the general one among

Americans. This plant is used in soups, but more generally boiled alone and served as greens. In the spring of the year, this is one of the most wholesome vegetables. By sowing at different times, we may have it at any season of the year, but it is more tender and succulent in the spring. The male and female flowers are produced on separate plants. The male blossoms are in long, terminal spikes, and the female in clusters, close at the stalk, on each joint.

Varieties—The two best are the *broad*, or *summer*, and the *prickly*, or *fall*. There are three others—the *English Patience Dock*, the *Holland*, or *Lamb's Quarter*, and the *New Zealand*. The first two are sufficient. Sow in August and September for winter and spring use, and in spring for summer. Sow in rich soil, in drills eighteen inches apart. Thin to three inches in the row, and when large enough for use, remove every other one, leaving them six inches apart. To raise seed, have male plants at convenient distances, say one in two or three feet. When they have done blossoming, remove the male plants, giving all the room to the others, for perfecting the seed. Success depends upon very rich soil and plenty of moisture.

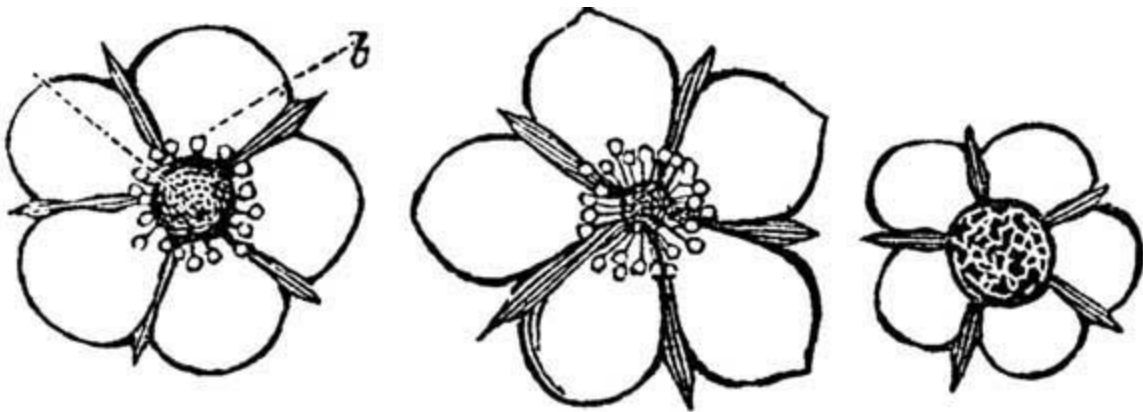
SQUASH.

There are several varieties of both summer and winter squashes. All the summer varieties have a hard shell, when matured. They are usually eaten entire, outside, seeds and all, while young and tender, from one quarter to almost full grown. They are also used as a fall and winter squash, rejecting the shell and that portion of the inside which contains the seeds. The *Summer Crookneck*, and *Summer Scolloped*, both *white* and *yellow*, are the principal summer squashes. The finest is the *White Scolloped*. The best winter varieties are the *Acorn*, *Valparaiso*, *Winter Crookneck*, and *Vegetable Marrow* or *Sweet Potato squash*. The latter is the best known.

Cultivate as melons, but leave only two plants in a hill. They do best on new land. Varieties should be grown far apart, and far removed from pumpkins, as they mix very easily, and at a great distance. Bugs eat them worse than any other garden vegetable. The only sure remedy is the box covered with gauze or glass. As they are great runners, they do better with their ends clipped off. Used as a vegetable for the table, and in the same manner as pumpkins, for pies.

STRAWBERRY.

None of our small fruits are more esteemed, or more easily raised, and yet none more frequently fails. Failures always result from carelessness, or the want of a little knowledge of the best methods of cultivation. We omit much that might be said of the history and uses of the strawberry, and confine ourselves to a few brief directions, which, if strictly followed, will render every cultivator uniformly successful. No one need ever fail of growing a good crop of strawberries. In 1857, we saw plats of strawberries in Illinois, in the cultivation of which much money had been expended, and which were remarkably promising when in blossom, but which did not yield the cultivators five dollars' worth of fruit. In the language of the proprietors, "they blasted." Strawberries never blast; but, for the want of fertilizers at suitable distances, they may not fill. There are but three causes of failure—want of fertilizers, excessive drought, and allowing the vines to become too thick. Of most of our best varieties, the blossoms are of two kinds—pistillate and staminate, or male and female—and they are essential to each other. The pistillate plants bear the fruit, and the staminate are the fertilizers, without which the pistillates will be fruitless. There are three kinds of blossom—pistillate, staminate, and perfect, as seen in the cut.



1. Perfect blossom. 2. Staminate blossom. 3. Pistillate blossom.

The first (1) is perfect; that is, has both the stamens and pistils well developed: this will produce a fair crop of fruit, without the presence of any other variety. The second (2) has the stamens large, while the pistils (the apparently small green strawberry in the centre) are not sufficiently

developed to produce fruit: such plants seldom bear more than a few imperfectly-formed berries. The third (3) has pistils in abundance, but is destitute of stamens, and hence, will not bear alone. The two latter are to be placed near each other, to render them productive; they may be readily distinguished when in blossom. It is always safe to cultivate the hermaphrodite plants; that is, those producing perfect blossoms; but the pistillates and staminate, in due proportions, produce the largest crops, and finer fruit.

Soil.—Much has been said against high fertilization with animal manures, and in favor of vegetable mould only. We feel entirely satisfied that the largest crops of strawberries are grown on land highly manured with common barnyard manure. To plant and manure a strawberry-bed, begin on one side, and dig a trench eighteen inches deep (from two to three feet is much better) and as wide; put six inches of common manure in the bottom; dig another trench as deep, and place the soil upon the manure in the first trench; fill the last with manure as the first, and so on over the whole plat. Manure the surface lightly with very fine manure and wood-ashes.

Transplanting is usually better in the month of August. If done at that season, and it be not too dry, the plants will get such a growth the same season as to produce quite a good crop of fruit the next season. Planted as early in the spring as it will do to stir the soil, they are more sure to grow and yield a very few berries the first season, and very abundantly the next. If you would cultivate in hills, put them two feet apart each way; if otherwise, two feet one way, and one foot the other. Cut off the roots to two or three inches in length, and remove all the dead leaves; dip them in mud, which is a great means of causing them to grow; and set them in fine mould, the crown one inch below the level of the soil around, and leave it in a slight basin, and water it, unless the weather be damp. Many plants are lost from not being set low enough to escape drought. The basin will hold water, and nearly every plant will grow; excessive water will destroy them. Set out three or four rows of pistillate plants, and then one of the staminate, or fertilizers. Some set them out in beds and allow them to cover the whole ground, and cultivate by spading up the bed in alternate sections of eighteen inches or two feet each year, turning under, in the spring, that portion that bore fruit the previous season—which has long been recommended by good authority. This was the lamented Downing's method. We think rows preferable for this reason. The young

plants formed by the runners are less vigorous after the first; hence, the tendency is to deterioration by this mode of culture. And this method does not afford so good an opportunity for stirring the soil around the plants as planting in rows; this stirring the soil is a great means of protecting from drought, and securing the most vigorous growth. Deep subsoiling between the rows early in the spring, or after fruiting, is valuable; hence, we always advise to cultivate in hills two feet apart each way, and renew them after they have borne two, or at most three crops.

Hermaphrodites are best for cultivation in beds. Many strawberry-beds do well the first year of their bearing, but are almost useless afterward. The cultivator says they all run to vines. In such cases, they overlook the fact that the staminate plants grow altogether the fastest, because their strength goes to support foliage in the absence of fruit, while bearing vines require much of their strength to mature the fruit; hence, if they are allowed to run together the second, or at most the third year, the fertilizers will monopolize the ground and prevent fruiting. This is the greatest cause of failure of a crop, next to a want of both kinds of plants. This is the origin of fears of having land too rich. It is said it all runs to vines without fruit; this is because the wrong vines have intruded—the staminates have overcome the pistillates. We reject the whole theory of the luxuriance of the vines preventing the production of fruit. The larger the vines the more fruit, provided only the vines are bearers, and not too thick: hence this invariable rule—*always have fertilizers within five feet, and never allow the two kinds to run together*. Manures should be applied in August, well spaded in. Applying in the spring to increase the crop for that season, is like feeding chickens in the morning to fatten them for dinner—it is too late. Fertilizing in August is a good preparation for a large crop for the next season. Strawberry-vines, in all freezing climates, should be covered, late in the fall, with forest-leaves or straw, to protect from the severity of winter, and enrich the land by what can be dug into the soil in spring. Rotten wood, fine chips, sawdust, &c., are all good for a fall top-dressing. After well hoeing and weeding in spring, until blossom-buds appear, just before the blossoms open, cover the bed thoroughly with spent tanbark, sawdust, or fine straw. This will keep down weeds, preserve moisture in the soil, enrich the ground, and protect the fruit from injury by rains, and in part from worms and insects. This should never be omitted.

Varieties are numerous, and, from the ease with which they are raised from seed, will rapidly increase; it is so frequent to have blossoms fertilized by pollen from several different varieties. Some of the most marked varieties are known in different parts of the country by very different names; hence, we advise cultivators to select the best in their locality. Every valuable variety is soon scattered over the country. The following are good:—

Burr's New Pine.—Originated at Columbus, Ohio, in 1856. Hardy, vigorous, and quite productive; very early; tender for market, but superior for a private garden.

Western Queen.—Originated at Cleveland, Ohio, by Professor J. P. Kirtland, 1849. Very hardy and productive; larger than the Hudson or the Willey; good for market; bears carriage well.

Longworth's Prolific.—Origin, Cincinnati, 1848. Regular, sure, full bearer of large, delicious fruit; good for market; an independent bearer.

M'Avoy's Superior.—Cincinnati, 1848. Received one-hundred-dollar prize from the Cincinnati Horticultural Society in 1851. Exceedingly large; hardy; female or pistillate flowers; needs fertilizers, and then is one of the best ever grown; rather tender for carriage, though it is extensively sold in Western markets.

Jenney's Seedling.—Valuable for ripening late; fruit large and regular; very productive, 3,200 quarts having been gathered from three quarters of an acre.

Hovey's Seedling.—Elliott puts it in his second class; but we can not avoid the conviction that it is one of the best that ever has been raised. It is pistillate, but with fertilizers it yields immense crops, of very fine large fruit. Boston Pine is one of the best fertilizers for the Hovey Seedling.

Hudson Bay.—A hardy and late variety, highly esteemed.

Pyramidal Chilian.—Hermaphrodite, highly valued.

Crimson Cone.—An old variety, quite early, and something of a favorite in Eastern markets.

Peabody's New Hautbois.—Originated in Columbus, Georgia, by Charles A. Peabody. Said to bear more degrees of heat and cold than any other variety.

Very vigorous, fruit of the largest size, very many of the berries measuring seven inches in circumference. Flesh firm, sweet, and of a delicious pineapple flavor. Rich, deep crimson. It may be seen in full size in the patent office report on agriculture for 1856. If this new fruit sustains its recommendations, it will prove the best of all strawberries.

Downing describes over one hundred varieties. We repeat our recommendation to select the best you can find near home. The following rules will insure success:

1. Make the ground very rich.
2. Put fertilizers within five feet of each other, and never allow different kinds to run together.
3. Cover the ground two inches deep with tan-bark, sawdust, or fine straw, just before the blossoms open; tan-bark is best.
4. Never allow the vines to become very thick, but thin them out.
5. Water every day from the appearance of the blossoms until done gathering the fruit; this increases the crop largely, and, at the South, has continued the vines in bearing until November. Daily watering will prolong the bearing season greatly in all climates, and greatly increase the crop.
6. Protect in winter by a slight covering of forest-leaves, coarse straw, or cornstalks.
7. To get a late crop, keep the vines covered deep with straw. You can retard their maturity two weeks, and daily watering will prolong it for weeks.
8. Apply, twice in the fall and once in the spring, a solution of potash, one pound in two pails of water, or two pounds in a barrel of water in which stable-manure has been soaked.
9. The best general applications to the soil, in preparing the bed, are lime, charcoal, and wood-ashes—one part of lime to two of ashes and three of charcoal. The application of wood-ashes will render less dissolved potash necessary.

These nine rules, strictly observed, will render every cultivator successful in

all climates and localities.

SUGAR.

There have, until recently, been but two general sources of our supply of sugar—the sugar-cane of the South, and the sugar-maple of the North. Beet-sugar will not be extensively manufactured in this country. We now have added the Sorgho, or Chinese sugar-cane, and the Imphee, or African sugar-cane, adapted to the North and the South, flourishing wherever Indian corn will grow, and raised as easily and surely, and much in the same way. Of the methods of making sugar from the old sugar-cane of the South, we need give no account. It is not an article of general domestic manufacture. It is made on a large scale on plantations, and is in itself simple, and easily learned by the few who become sugar-planters.

The process of manufacturing sugar from the maple-tree is very simple and everywhere known. It is to be regretted that our sugar-maples are being so extensively destroyed, and that those we pretend to keep for sugar-orchards are so unmercifully hacked up, in the process of extracting the sap. To so tap the trees as to do them the least possible injury, is a matter of much importance. Whether it should be done by boring and plugging up with green maple-wood after the season is over, or be done by cutting a small gash with an axe and leaving open, has been a disputed point. Many prefer the axe, and think the tree will be less blackened in the wood, and will last longer, provided it be judiciously performed. Cut a small, smooth gash; one year tap the tree low, and another high, and on alternate sides; scatter the wounds, made from year to year, as much as possible. Another process of tapping is now most popular with all who have tried it. Bore into the tree half an inch, with a bit not larger than an inch, slanting slightly up, that standing sap or water may not blacken the wood. Make the spout out of hoop-iron one and a fourth inches wide; cut the iron, with a cold chisel, into pieces four inches long; grind one end sharp; lay the pieces over a semicircular groove in a stick of hard wood, and place an iron rod on it lengthwise over the groove—slight blows with a hammer will bend it. These can be driven into the bark, below the hole made by the bit. They need not extend to the wood, and hence make no wound at all. If the wound dries before the season is over, deepen it a little by boring again, or by taking out a small piece with a gouge. This process

will injure the trees less than any other. The spouts will be cheaper than wooden ones, and may last twenty years. Always hang buckets on wrought nails, that may be drawn out. Buckets made of tin, to hold three or four gallons, need cost only about twenty-five cents each, and, with good care, may last twenty years. A crook in the wire of the rim will make a good place to hang upon the nail. A hole bored in the ear of other buckets will answer the same purpose. In all windy situations, the bucket must be near the end of the spout, or much will be lost by being blown over by the wind. Great care to keep all vessels used, clean and sweet, and not burn the sugar in finishing it, will enable any one to succeed in making good maple-sugar. The various forms in which it is put up, and the manner of draining, are familiar to all makers. It is only necessary to add, that there are few small farms on which the sugar-maple will grow, where there might not be raised two or three hundred maples, within fifteen or twenty years, that would add greatly to the beauty, comfort, and value of the farm. On the highway as shade-trees, or on the side of lots, they would be very ornamental and profitable, without doing injury. We can not too strongly recommend raising sugar-maples. Always cultivate trees that will bear fruit, yield sugar, or be good for timber.

Sorgho, or Chinese sugar-cane, is raised much as Indian corn—only, it will bear some ten or twelve stalks in a hill, instead of three or four. In all parts of our continent, it produces enormous crops of stalks. The trials thus far indicate, that the quantity of saccharine matter it contains is not quite equal to that of the common sugar-cane; but, with the necessary facilities for manufacturing, it makes quite as good sugar and as fine sirups as the other cane. Suitable machinery, that need not be expensive, owned by a neighborhood of farmers, may enable all Northern men, where other cane will not grow, to make their own sugar cheaper than to buy. But it will be made probably by large establishments as other sugar. We give no method of making it. The subject is so new, that every method of manufacture finds its way into all the newspapers, and what might appear the best to-day would be quite antiquated to-morrow. We have seen as fine sugars and sirups, of all the different grades, made from this new cane, as any others we have ever tasted. The question is settled that imphee and sorgho will make good sugar in abundance. A few years will place such sugars among the great staple products of the country.

SUMMER-SAVORY.

This is a hardy annual, raised from seed on any good soil, with no care but keeping free from weeds. The seed is small, and may not vegetate well in dry, warm weather, without a little shade or regular watering. Its use for culinary and medicinal purposes is well known. Gather and dry when nearly ripe. Keep in paper bags, or pulverize and put in glass bottles. For the benefit of persons who keep those sprightly pets called fleas, we mention the fact that dry summer-savory leaves, put in the straw beds, will expel those insects.

SUNFLOWER.

This large, hardy, annual plant would be considered very beautiful, were it not so common. Three quarts of clear, beautiful oil are expressed from a bushel of the seed, in the same way as linseed-oil. The seed, in small quantities, is good for fowls. It may be grown with less labor than corn.

SWEET POTATO.

This is a Southern plant, but is now being acclimated in Northern latitudes. Good sweet potatoes are now grown in the colder parts of Vermont, Wisconsin, and Minnesota. There are many varieties, and they are increasing by seedlings. Not long since, they were said to bear no seed; but recently, in different parts of the country, seeds have been found, and new varieties grown from them. Certain varieties are best in different localities. They will always find their way through growers of plants. The process of growing is simple, but must be carefully followed to insure success. Plant the seed potatoes in a moderate hotbed, at the time when grass begins to start freely. Keep well watered, and do not allow them to get too warm. An hour's overheating will cause them all to decay. The heat, when it begins to rise too high, is at once checked by a thorough drenching with cold water: if too low, the heat is raised by a tight cover, in a warm sun, and by watering with warm water. Water them every day after they are up. The sprouts, when six inches high, are pulled off from the potato, and set out as cabbage-plants; this should be done as soon as all danger of frost has ceased. The same potatoes will sprout as many times as they are pulled off.

Sweet potatoes need much sun and warmth; they are, therefore, planted on round hills, or, better, on ridges, which may be principally thrown up with a plow, and made from a foot to eighteen inches high. Set the plants in the top, about fifteen inches or two feet apart; keep clear of weeds, making the hill or ridge a little larger by each hoeing. The tops, being long running vines, will soon cover the ground. They produce better tubers for throwing the vines, in a twist, up over the top of the rows. They will take root at each joint of vine, when undisturbed, which roots will draw from the main tuber. These roots would be as good and large as any, if they had time: hence, at the South, one half of the crop is grown from sets, from cuttings of the ends of the early-planted vines. At the North, where seasons are short, these joints must be prevented—by throwing up, as above, or loosening—from taking root. The tubers will need all the strength; the plant and tuber are tender, and a little frost will kill the vines and cause the potatoes to decay. They may be kept for use until January by packing, when dug in a warm day, in the soil in which they grew;—kept through winter, packed in straw or chaff, in boxes that will contain about two or three bushels each, and kept in a room with a fire: the room should be at a temperature of from forty to sixty degrees; fifty-five is best, though seventy will not destroy them; more or less will cause them to decay. The boxes may be placed one upon another, but should be left open, that their moisture may evaporate. Dry sand (kiln-dried), sifted over and close among them, will preserve them. Free circulation of air is indispensable. It is usually cheapest to buy the plants of those who make a business of raising them. They are very hardy—may be transported one thousand miles and do just as well. To transplant with perfect safety in a dry time, after the plant has been put in its place, pour in a pint of water, and cover it with a little dry soil to prevent baking—and not one out of fifty will perish.

These few brief directions will enable any one to be successful wherever corn will grow. A new variety has just been brought into Alabama from Peru, that is pronounced superior to all others; a prodigious bearer, even on poor sandy land, and far more hardy than other varieties, the root retaining its excellence as it came out of the ground till the following May.

SWINE.

Hogs are evil in their propensities, mischievous and filthy in their habits, and

yet profitable to the farmer. Every farmer should keep a few in proportion to the refuse grain and various slops that his establishment may afford. Buying hogs and then purchasing grain on which to fatten them in the usual way is the poorest economy. Such pork is often made to cost from twelve to twenty cents per pound.

There are many breeds of swine highly recommended. Some of the varieties of the Chinese are the most prolific and have the greatest tendency to fattening of any known. They have formed the basis of the great improvements in the breeds in Great Britain. Farmers will be able to select the best breed from their own knowledge and observation, better than from any directions we can give them. Every new variety will be introduced by dealers, and farmers must be cautious how they accept their representations.

Age of Swine for Pork.—It is most profitable and least troublesome, to keep over winter, no swine but breeding sows, to have pigs early in spring, to kill in autumn. Of any of the good breeds, they can be made to weigh from 300 to 350 pounds, by the proper time for killing. The practice of keeping swine till eighteen or twenty-four months old, and only fattening them late in the fall and beginning of winter, is very unprofitable. It is best to give pigs about what they will eat, from the time of beginning to feed them until they are slaughtered. This is in every way most economical. It secures fattening in the hot weather in summer, when pork can be made faster and cheaper than at any other time. Many farmers begin to fatten their pork, after the season in which it can most rapidly and cheaply be done.

Hogs having been kept poor, on being fed freely for fattening, become cloyed, and much time is lost, while those that always have had what they would eat, of good wholesome food, always have a good appetite for as much as they need, and not root over and injure more.

Food for Swine.—They do better shut up in a pen, but where they can get access to the ground. All edible roots are good and all the grains. But grain should be ground or soaked. It pays well to cook all food for swine. Boiled potatoes, carrots, beets, and parsnips, are all good. Ground feed should be mixed with cooked vegetables. The disposition that swine have to root deep in the ground, indicates the want of something, not found in sufficient quantities in their ordinary food. Numerous experiments show that that

deficiency is abundantly supplied by having charcoal within their reach. The stories of fattening pork wholly on charcoal, which we find in the books, we do not credit. But that small quantities of it are uniformly healthy for swine, is an established fact. The question of sour food has many respectable advocates. Cultivators and writers take different sides of the question, based as they say upon their carefully-tried and noted experiments, one affirming that fermented food is superior, and others that it has done his hogs positive injury. This discrepancy grows out of not carefully distinguishing the different kinds of fermentation, the sweet, the vinous, the acid, and the putrid. The first makes excellent food, the second will do quite well, the third is injurious, and the last absolutely poisonous. As it requires much care and observation to get this right, and mistakes are easy, it is best to take the sure method, give them food in a natural state, ground, and either cooked or fed raw. Either will make good pork at a reasonable cost, but cooked food is preferable.

Sows are prevented from destroying their young by quiet, plenty of food, and little animal food, and but a very little straw in a dry pen, or washing the pig's backs with a strong decoction of aloes.

TOBACCO.

This is a plant abhorred by everything but man and the tobacco-worm. Its use for chewing and snuffing is happily becoming more and more offensive to refined society, and we hope it may, after a long struggle, go out of use. For those who will cultivate it as an article of commerce, the following brief directions are sufficient. Burn over a small bed, on which sow the seed early in March. When the leaves are as large as a quarter of a dollar, transplant them in deep, rich soil, or on new land, in rows three feet apart each way, or four feet one way and two the other. Tend as cabbage. It is necessary, twice in the season, to destroy, by hand, the large green worms that feed on this plant. When the plants are from two and a half to three and a half feet high, according to the richness of the soil on which they grow, pick out the head or blossom-buds, except in the few plants you would have go to seed. Pinch off also the suckers, or shoots behind the leaves, as they come out. When the leaves are full grown and begin to ripen, which is known by the small, dusky spots appearing on the leaves, cut up the stalks and lay them down singly to

wilt; when they are thoroughly wilted, lay them together, that they may sweat for forty-eight hours, then hang them up in a tolerably tight room to dry—hang across poles, one on each side. A sharp stick put through the but of the stalks and laid over the pole, leaving one stalk on each side, is a very good method. When it becomes well dried, pick off the leaves, and tie the stems together in small bunches, and pack away in hogsheads or boxes, in a dry place.

We recommend to every agriculturist to cultivate a little tobacco—not for himself or others to chew, snuff, or smoke, but to use in destroying insects. A strong decoction, used in washing animals, will destroy lice on horses and cattle, and ticks on sheep. Tobacco-water applied to plants, or trees, will effectually destroy all insects with which they may be infested. Boil tobacco-stems or stalks, or the refuse-tobacco of the cigar-makers, until you make a strong decoction, and apply with a syringe, or in any other way, and it will prove more effectual than anything else known. Tobacco-stems, stalks, or leaves, laid around peach-trees in the month of May, will protect them from the attacks of the borer. This is also a good manure for peach-trees.

TOMATO.

This vegetable is well known, and has recently come to be generally esteemed. It can always be grown without failure, and more easily and at one fourth of the cost of potatoes. Its use for cooking, eating raw, and pickling in various forms, is known to all. There are several varieties. The best of all is the large red—not the largest, but the smooth ones: although smaller, they contain more, and are much more conveniently used, than the very large rough or scolloped variety. The large yellow are less liable to decay on the vines, and have less of the tomato taste. The small plum-tomato, both red and yellow, and the pear or bell-shaped, are good for preserving as a common sweetmeat, and for pickling whole. They should be started in early hotbed—in February in the Middle States—and transplanted after frosts are over, in rows eight feet apart each way. That distance will leave none too much room for letting in the sun and for the convenience of picking. They will mature on the poorest land; but the amount of the crop is graduated altogether by the richness of the soil, and the care given them. They will produce frequently a bushel to a vine, lying on the ground. But they ripen better, and as the vines

are not injured by picking the early ones, they will produce more, by being trained up. A few sticks to hold them up at first, and let them break down over them later, is of no use. Train them, and tie up all the principal bunches, and they will be greatly benefited thereby. Tied to slats, or any board fence, in a kind of fan-training form, they do very well. In all cities and villages, enough for a large family can be grown on twenty-five feet of board-fence, exposed to the southern or eastern sun, and not occupy the ground a single foot from the fence. Drive in nails, and tie up the branches as they grow. Removing some of the branches and leaves, and letting in the sun, or placing the fruit on a shingle or stone, hastens its ripening.

TOOLS.

It is no part of our design to go into any general description of agricultural implements. There are constant changes and improvements, and they are introduced at once to the whole country by the inventors or dealers. We also wish to avoid all participation in the controversies respecting the merits of various new inventions. We have several forms of cultivators, horse-hoes, subsoil-plows, drills, seed-sowers, land-diggers, and drainers, various formed plows, root-cleaners, corn-planters, &c., &c. These possess different degrees of merit; all have their day, and will be superseded by others, in the general advancement that marks the science of soil-culture. We strongly recommend the use of the best tools, especially subsoil-plows, seed-planters, and root-cleaners. Always have a tool-house, as much as you do a kitchen. Use the best tools; never lay them down but in their proper place; and always clean them before putting them away. Keep all the wood-work of tools well painted, and the iron and steel in a condition, by the application of oil and otherwise, to prevent rust. Good tools facilitate and cheapen cultivation, and increase the yield of crops, Money paid out for such tools is well expended.

TRAINING.

This is a matter that has received much attention from all fruit-growers. The influence of different modes of training and pruning is very great on the bearing qualities of trees. The peculiarities demanded by the various fruit-trees, vines, and bushes, are given under these articles respectively. We give

here only some general principles. The health, beauty, and profit, of most fruit-trees depend upon judicious pruning and training. The following are the general objects:—

1. To secure regular growth and prevent deformities, and thus promote the health of trees.

2. To secure a sufficient number of fruit-bearing shoots, and in right locations, and to throw sufficient sap into those shoots to enable them to mature the fruit. With a certain amount of pruning, you may double the quantity of fruit, or destroy half that the trees would have produced if not trained at all. One half of the fruit of any orchard depends upon correct pruning. It also has a great influence upon the quality of fruit. The cherry is almost the only fruit-tree that throws out nearly the right number of branches, and in the right places. It needs a very little direction while young, and afterward only the removal of decaying branches. The quince needs considerable trimming at first; but, the head once formed, it will need very little after-pruning. Next comes the plum, needing, perhaps, a little more pruning than the cherry or quince, but much less than the other fruits. The plum is apt to throw out strong branches, in some directions, quite out of proportion with the rest of the top. Such need shortening in, to distribute the sap equally through the tree, and thus produce a symmetrical form. This is all the trimming necessary. The roots of a plum-tree are usually stronger than the top, and absorb more than the leaves can digest; hence some of its diseases. The natural remedy would be root-pruning, and leaving the top in its natural state, except shortening-in the disproportioned branches. Removing much of the top of a plum-tree would ordinarily prove injurious. The apple needs considerable pruning, but not of the spurs and side-twigs which bear the fruit, but of limbs that grow too thick, and of disproportioned luxuriance. (See under Apple.) So the pear must be often slightly pruned to check the too vigorous growth and encourage the too tardy. The peach must be so pruned as to prevent the long bare poles so often seen, and to secure annually the growth of a large number of shoots for next year's bearing, and to check the flow of the sap by cutting off the ends of the growing young shoots, so as to cause the formation on each, of a few vigorous fruit-buds. Peach-trees, so pruned, will be healthy and do well for fifty years, and produce a larger number of better peaches than will grow on trees left in the usual way. By a system of pruning that will equalize the growth and strength, the bearing will

be general on all the branches of the tree. This will make the fruit more abundant and of better quality. The following six principles—first stated by M. Dubreuil, of France, and since presented to the American people in Barry's "Fruit-Garden," and still later in Elliott's "Fruit-Book"—will guide any attentive cultivator into the correct method of pruning and training:—

1. The vigor of a tree, subject to pruning, depends, in a great measure, upon the equal distribution of sap in all its branches.
2. The sap acts with greater force, and produces more vigorous growth on a branch pruned short than on one pruned long.
3. The sap, tending always to the extremities, causes the terminal shoots to push with more vigor than the laterals.
4. The more the sap is obstructed in its circulation, the more likely it will be to produce fruit-buds.
5. The leaves serve to prepare the sap for the nourishment of the tree, and to aid in the formation of fruit-buds. Therefore, trees deprived of their foliage are liable to perish, and they are injured in proportion to their defoliation.
6. When the buds of any shoot or branch do not develop before the age of two years, they can only be forced into activity by very close pruning; and this will often fail, especially in the peach.

Observe the foregoing, and never cut large limbs from any tree, except in grafting an old tree (and then only graft a part of the top in one year, especially in the pear), and of old, neglected peach-trees, to renew the top, and any careful cultivator can raise an orchard of healthy, beautiful, and profitable trees. There are different forms of training that have gone the rounds of the fruit-books, that are nearly all more fanciful than useful. There are four forms of fan-training, and several of horizontal and conical. The following only are useful:—

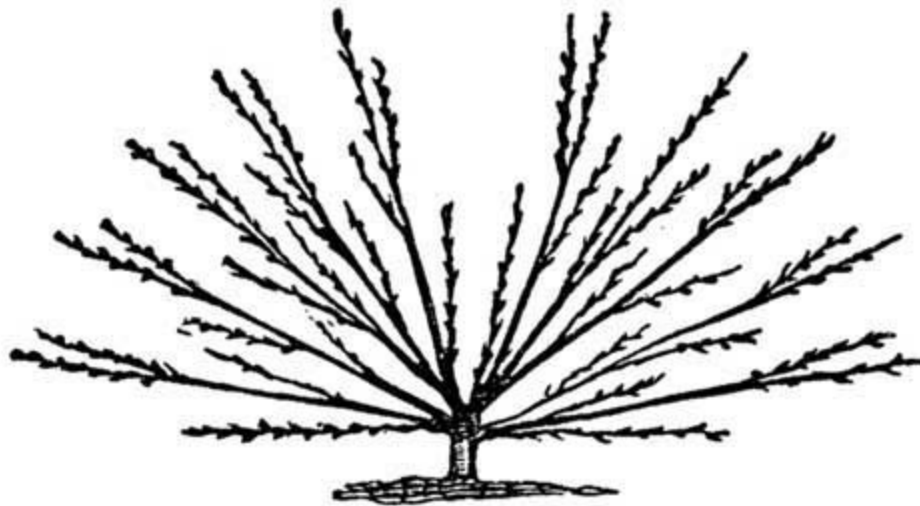
Fan-Training.—A tree but one year from the graft, or bud, is planted and headed down to within four buds of the ground, the buds so situated as to throw out two shoots on each side (see fan-training, first stage).



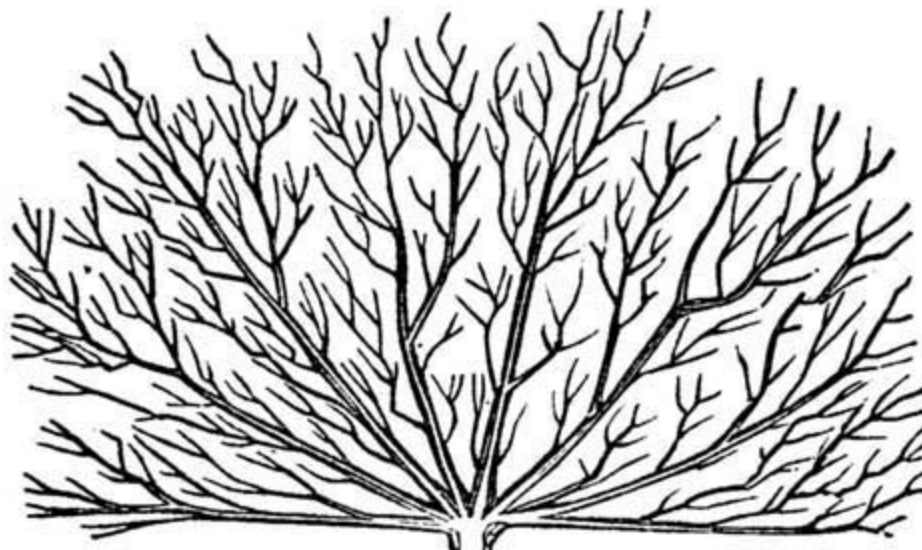
Fan-training, 1st stage.



Fan-training, 2d stage.



Fan-training, 3d stage.



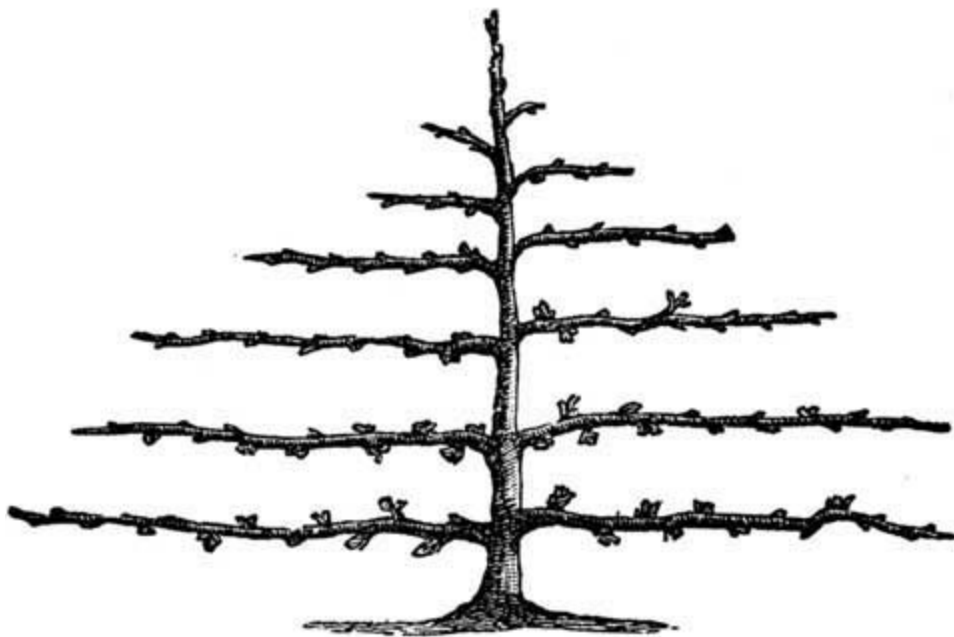
Fan-training, Complete.

The following season, the two upper shoots are to be cut back to three buds, so as to throw out one leading shoot, and one shoot on each side. The two lower shoots are to be cut back to two buds, so as to throw out one leading shoot, and one shoot on the upper side. In this second stage, you will have a tree with five leading shoots on each side (see cut, fan-training, 2d stage). These shoots form the future tree, and should neither be shortened in, nor allowed to bear fruit this year.

Each shoot should now be allowed to produce three shoots, one leading one, and two others on the upper side, one near the bottom, and the other half way up the stem. All others should be pinched off when they first appear. At the end of the third year you will have the appearance in the cut (Fan-training, third stage). After this it may bear fruit, but not too much, as a young tree so trained, is disposed to over-bearing. These shoots, except the leading ones, should be shortened back; but to what length depends upon the vigor of the tree. This is to be continued and extended as the grower may choose, always preventing the top from becoming too dense, and the shoot too long for a proper flow of sap, and maturity of fruit-buds. A good form, though slightly irregular, is seen in the cut (Fan-training, complete). Such trees trained against walls, or better, on trellis-work, are beautiful and very productive.



Horizontal Training, first stage.



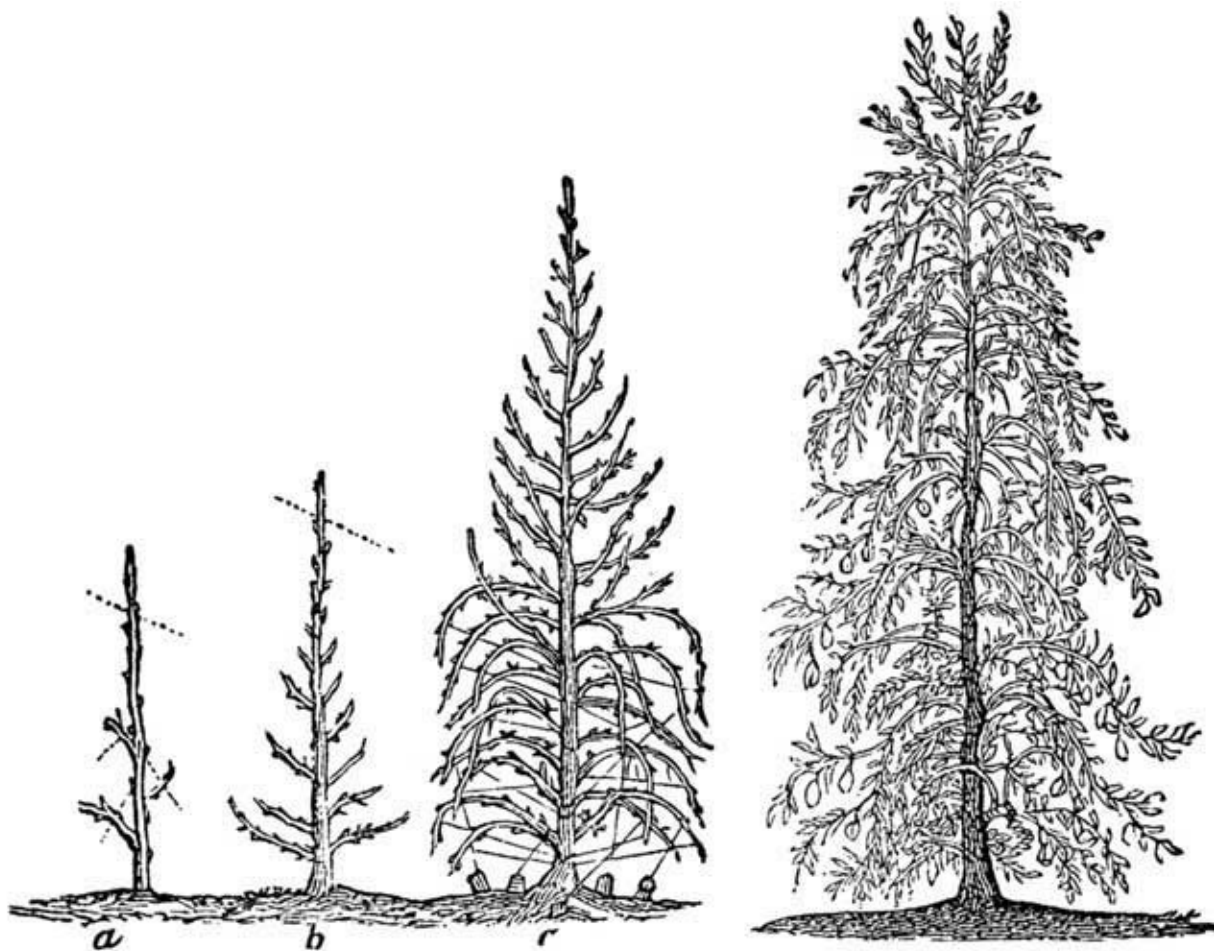
Horizontal Training, fourth year.

Horizontal Training is another form contributing to fruitfulness, by regulating the flow of the sap. This is done by preserving an upright leader with lateral shoots at regular distances. To secure this, such shoots as you wish to train must be tied in a horizontal position, and all others pinched off on first appearance.

The process is simple and easy, continued as long as you please. Head in the shoots of these lateral branches to two or three buds and they will bear

abundantly. As the growth increases, remove all that are not in the right places, and train all you spare, as before. In the fourth year, you will have trees of the appearance in the cut (Horizontal Training, fourth year).

Conical Training.—The Quenouille (pronounced *kenoole*) of the French, is the best of all forms of training, especially for the pear. To produce conical standards, plant young trees four or five feet high, and after the first year's growth, head back the top, and cut in the side branches, as in the cut (Progressive stages of conical training).



Progressive stages of Conical Training. Conical Training complete.

The next season several tiers of side branches will shoot out. The lowest should be left about eighteen inches from the ground, and by pinching off a part, others may be made to grow, at such distances as you may desire. At the end of the second year, the leader is headed back to increase the growth of

the side shoots. The laterals will constantly increase, and you must save only a sufficient number. The third or fourth year, the lateral branches may be bent down and tied to stakes. The branches must be tied down from year to year, and the top so shortened in as to prevent too vigorous growth, and throw the sap into the laterals. This may be continued until the tree will exhibit the appearance in the cut (conical training complete). When the tree has become thoroughly formed it will retain its shape without keeping the branches tied. The fan and horizontal training are valuable for fruits that need winter protection, and they are also very ornamental, and enable us to cultivate much fruit on a small place. All these forms of training increase largely the productiveness of fruit-trees. It is recommended for all small gardens and yards, and will pay in growing fruit for market.

TRANSPLANTING.

Trees should be transplanted in spring in cold climates, and in autumn in warm regions. The top should be lessened about as much as the roots have been by removal. Cutting off so large a part of the top as we often see is greatly injurious. Trees frequently lose one or two years' growth, by being excessively trimmed when transplanted. The leaves are the lungs of the tree, and how can it grow if they are mostly removed? All injured roots should be cut off smoothly on the lower side, slant out from the tree, and just above the point of injury. Places for the trees should be prepared as given under the different fruits and the trees set firmly in them an inch lower than they stood in the nursery. The great point is to get the fine mould very close around all the roots, leaving them in the most natural position. Trees dipped in a bucket of soil or clay and water, thick enough to form a coat like paint, just at the time of transplanting, are said to be less liable to die. Every transplanted tree should have a stake, and be thoroughly mulched. Trees properly transplanted will grow much faster, and bear a year or two earlier, than those that have been carelessly set out. For further remarks on this important matter, see under the different fruits.

TURNIP.

This is one of the great root crops of England, and to considerable extent in

this country, for feeding purposes. We think it should be displaced, mostly, by beets, carrots, and parsnips. They are more nutritious, as easily raised, and more conveniently fed. The Rutabaga is a productive variety, and possesses a good deal of nutriment. The essentials in raising good turnips of most varieties, are very rich soil, worked deep, and finely pulverized. They should stand in rows two feet apart, and one foot apart in the rows. They may be mainly tended with a small cultivator or root-cleaner.

English turnips are extensively grown as a second crop on wheat stubble, &c. The soil is highly enriched and the seed sown in rows to allow cultivation. The best method, however, is to turn over old greensward say June 1, and yard cattle or sheep on it till July 10, and then harrow thoroughly, and sow the seed broadcast. The yield will usually be large, and they will need very little weeding. If it is not convenient to yard cattle on the turnip-ground, apply fifteen double wagon loads of fine manure with a few bushels of lime to the acre, and the crop will be large. The usual time of sowing turnips is from the 10th to the 25th of July. We think the yield is larger when sown by the middle of June. The only way to get good early turnips is to sow them very early. The flat, or common field turnip, is easily grown on new land, or on any rich soil tolerably free from weeds and not infested with worms.

WHEAT.

This is the most highly esteemed of all grains, and has more enemies, and is more affected in its growth by the weather, than any other. It has engaged more attention in the study and writings of agriculturists than all other cereals. The outlines only of the results of the vast field of investigation and experiment on wheat-growing can be presented here. There are doubts respecting the origin of wheat. The more general and probable theory is, that it is the product of the cultivation, for a series of years, of a species of grass called *Ægilops*. This is indigenous on the shores of the Mediterranean, in those countries which, from time immemorial, have been the sources of our wheat. No one has ever found wild wheat in any country; it would be as strange as a wild cabbage or turnip. But the practical question is, How can wheat be most surely and profitably grown? The first requisite is a suitable soil. A clay or limestone soil is usually considered best, as there is much lime in wheat-bran. Such soil is better than light sand, or some of the poorer

loams. But the large yields of wheat on the Western prairies, and on the rich alluvial soils of California river-bottoms, shows that the best of wheat may grow on other than clay lands. The truth of the matter respecting soils for wheat, is, that any soil good for corn, potatoes, or a garden, may, with proper tillage, produce the best of wheat. Experience in England, and in all the old countries on the continent of Europe, shows us that old land may be made to yield as large crops of wheat as the virgin soil of the New World. The production of wheat at suitable intervals, for a century, on the same land, need not lessen its power to produce good wheat in large quantities. Wheat is a plant demanding a rich soil, worked deep, and not too wet: these three things will produce a good crop on any land. We say to all farmers, raise wheat on any land that you can afford to prepare. First, if your land has not a dry subsoil, underdrain it thoroughly: water standing in the soil, and becoming cold or stagnant, is very injurious to wheat. Drainage is hardly more essential to any other crop than this. Next, plow deep. Subsoiling, on most lands, is very important to wheat. Manure highly, and put the manure between the soil and the subsoil: this attracts the roots deep into the soil, which is the greatest protection against winter-killing, and the effects of excessive drought. Render the surface of the soil as fine as possible. A finely-pulverized soil is as essential for wheat as for onions. Coarse lumpy soils are so open to the action of the atmosphere as to render the growth unequal, and cause the roots of the plant to grow too near the surface, for dry weather or the cold of winter. Always apply lime to wheat-lands, unless it be a limestone soil—not too much at once, but a few bushels to the acre annually. On no other crop do wood-ashes and dissolved potash, applied in the coarse manures, pay so well as on wheat. Sowing the seed is next in importance. The three questions in sowing are the manner, the depth, and the quantity. Shall it be drilled or sowed broadcast? Broadcast sowing requires more seed, and is liable to be less evenly covered; hence, we should prefer drilling. The depth of the seed is to be determined by the texture of the soil. Careful experiments have shown, that on clay land there is no perceptible difference in the growth of the plants, at any of the stages, in seed sown at any depth, from a slight covering to three or four inches. At a greater depth, it comes up less regularly, and in every way is in a worse condition. But on a light soil, it is, no doubt, best to plant it from four to six inches deep. On very loose soils, as muck land and alluvial soils, the roots of the plants grow too near the surface, and are exposed to being thrown out by winter frosts, and destroyed. The

remedy is deep sowing and thorough rolling. The quantity of seed now more generally sown is from five pecks to two bushels per acre. Rich land will not bear so much seed as the poorer. It will grow so thick as to render the straw tender, and expose it to lodge and ruin the crop. Wheat tillers, or thickens up at the bottom, making many stalks from a single seed, quite as much as any other grain; hence, we believe that if it be sown at a proper time on very rich land, three pecks to the acre would be better than more. Such sowing would make more vigorous plants, with much stronger roots, which would withstand cold and unfavorable weather better than any other. We should still more strongly recommend another form of sowing, practised by some European cultivators with great success: it is, to drill in wheat, in rows two feet apart, and give it a spring cultivation; this gives great strength to the plants, destroys the weeds, promotes rapid growth by stirring the soil, and favors tillering, so that the rows will meet, and give a great growth. We doubt not this will yet be extensively adopted in this country. All wheat-land had better be rolled after sowing, and light lands, with a very heavy roller. Light sandy land, having a little clay mixed in as recommended under soils, well manured, the seed planted six inches deep, and the whole rolled with a heavy roller, will bear great crops of wheat.

As it respects fall or spring wheat, no positive directions can be given, adapted to all climates. In many localities it is of little use to sow winter wheat, as it is very uncertain. In other localities winter wheat almost always succeeds best. This question then must be determined by circumstances. The time of sowing winter wheat varies in different climates, according as it may be exposed to depredations of worms and insects in the fall. Farmers are not liable to mistake in this matter. Spring wheat, in all climates, should be sowed very early. It is hardly possible in all the Middle and Northern states to prepare the ground in spring, and get in wheat in suitable season.

The yield of a crop of spring wheat, depends materially upon the growth in the cool and moist weather of spring, when it spreads and its roots get a strong hold before the hot weather, that hurries up the stalks and ears to maturity. Hence plow in the fall, and harrow in the wheat, as early as possible, in the spring.

The varieties of wheat are numerous and uncertain. In the state of Maine, an intelligent cultivator, in 1856, recommended Java wheat as having a very stiff

straw, and producing a very heavy yield. The Mediterranean wheat is also a favorite variety. Club wheat has also had a great run, and is now very popular at the West. But of varieties no one can be confident. We notice in the discussions of the best agriculturists of England and Scotland, that they have doubts of the proper names of some of the best varieties. In a certain rich part of Illinois we know an unusually popular wheat, sold at high prices for seed, under the name of *mud club*, as being much better than the ordinary club. We happened to learn that it was nothing but common club wheat, sown on rather low ground, where it happened to grow very fair that season. It is only occasionally that such tricks are successfully played, but it is true that many varieties are the result of extra good or chance cultivation. The celebrated Chidham wheat, named from a place where it was successfully grown, was also called Hedge wheat, because a head found growing in a hedge was supposed to be the origin of it. Now it is not probable that that head was the only one of the kind in all the country, and it would by no means be identified in all localities. And as all wheat is the result of the cultivation of the *Ægilops* or some other wild grass, it shows us that varieties may be produced by cultivation. Great importance is therefore to be attached to frequently changing seed; especially bringing it from colder into warmer climates, and changing from one soil to a very different one. Thus seed raised on hard hills is highly valuable for alluvial soils. Thus the efforts to introduce so many new varieties from the dominions of the sultan, will prove of vast advantage to wheat culture in America. So let us be constantly importing the best from Great Britain and the British provinces and from California, and all the extremes of our own country. Such wheats are worth more for seeds than others, but any extravagant prices for seed wheat, under the idea of almost miraculous powers of production, are unwise.

It would be useless to go into a more extended notice of varieties, as some do best in certain localities, and all are rapidly spread through the dealers, and by the influence of agricultural periodicals. The best time to harvest wheat is when the straw below the head has turned yellow, and the grain is so far out of the milk as not to be easily mashed between the fingers, but before it has become hard. The grain is heavier and of better quality, and wastes far less in harvesting, than when allowed to ripen and dry standing in the field. Drying in good shocks is far better than drying before cut. Some have gone to extremes in early cutting, and harvested their wheat while in the milk, and

suffered serious loss in its weight. We sometimes have rain in harvest, which causes all the wheat in a large region to grow before getting it dry enough to house. A remedy is, to go right on and cut your wheat, rain or shine, and put it up, without binding, in large cocks of from three to five bushels, packing together as close as possible, however wet, and cover the centre with a bundle of wheat to shed rain. It will dry out without growing; and, although the straw will be somewhat mouldy, the grain will be perfectly good, even when it has been so wet as to make the top of the shocks perfectly green with grown wheat. This process is of great value in a wet season. To prepare seed-wheat for sowing, soak it for a day or two in very strong brine; skim off all that rises; remove the grain from the brine, and while wet, sift on fresh-slaked lime until it slightly coats the whole grain; put on a little plaster to render the sowing more pleasant to the hand. Wheat will lie in this condition for days without injury. So prepared, it will exhibit a marked superiority in the growing crop.

Enemies of wheat are numerous, and various remedies are proposed. The wire-worm is sometimes very destructive. Wheat planted with a drill, with a heavy cast-iron roller behind each tooth, will not suffer by them; they will only work in the mellow ground between the drills. Drive over a field of wheat exposed to injury from wire-worms with a common ox-cart, and you will notice a marked difference; wherever the cartwheel passed over, the wheat remains unharmed by the wire-worm, while on either side much of it will be destroyed. But the wheat-midge, or weevil, is the great enemy, rendering the cultivation of wheat in some localities useless. One precaution is, to get the wheat forward so early and fast as to have it out of the way before they destroy it. This is often done by early sowing, high fertilization, and warm land. Sometimes wheat is too late for them, and then a good crop is secured. But this can only be relied on in cool, moist climates. Our hot, dry seasons are not suitable for wheat, late enough to be out of the way of the weevil. The great remedy for this enemy is his destruction. Burning the chaff at thrashing is useless for this purpose. The worm has entered the ground to remain for the winter, before the wheat is harvested. We know of but one way to kill the weevil, and that is, by insect lamps or torches in the field in the evening. The flies are inactive until evening, when, from dusk till eight or nine o'clock, they deposite their eggs in the blossoms and chaff of the wheat. Now, it is ascertained that this fly, like many other insects, will fly several

rods to a light. Twenty-five torches at equal distances, in a ten-acre lot of wheat, would be near enough. Nearly all the flies in a field would fly to them in half an hour. These need be lighted only on pleasant evenings, as weevils will not work in wind or rain, and they only commit their depredations during the time the wheat is in blossom. Let twenty-five racks, or holders of some kind, be put up on ten acres of wheat, and have pitch-pine put in them and ignited, after the manner of night fishermen, and let this be done a few nights, during the blossoming season of wheat, and the fly will be destroyed and the crop saved, in the worst weevil-season that ever occurred. In the absence of pitch-pine, some other light can be devised—as, balls of rags dipped in turpentine and sulphur, as in a torchlight procession. Something can be devised that will burn brilliantly for an hour: this will not cost fifty cents an acre, during the weevil-season, and will prove almost a perfect remedy.

Rust in wheat is only avoided by getting your wheat to maturity before the rust strikes it. If it is nearly mature, and the rust strikes it, cut it and shock it up in the shortest time possible.

Wheat is a great subject in agriculture, on which many volumes have been written, and on which it is customary to write long articles. We trust the recapitulation of what we have said, in the following brief rules, is more valuable to the practical wheat-culturist than any large volume could be. Analyses of wheat-bran and straw, the philosophy of rust in wheat, the length, size, and color of the weevil, and the great diversity of opinions on wheat-growing, are not what practical men regard. The one question is, How can I grow wheat surely and profitably? The following rules answer this important question, rendering failure unnecessary:—

1. Make your soil very rich, putting the manure as deep as convenient. Apply lime, wood-ashes, and potash, the latter dissolved and applied to your coarse manure.
2. Under-drain thoroughly all wheat-land, except that on a dry subsoil.
3. Plow deep and subsoil all wheat-lands, except those on a gravelly or sandy bottom.
4. Plant wheat from two to six inches deep, according to the texture of the soil—deepest on the lightest soil. Roll after sowing, and roll light lands with

a heavy roller.

5. Always get your wheat in early, and in a finely-pulverized soil, and be careful not to seed too heavy.
6. Sow seed that has not long been grown in your vicinity, and steep it two days, before sowing, in a brine, with as much salt as the water will dissolve, sifting fine, fresh lime over the wet grain, after removing it from the brine; put on, also, plaster-of-Paris or wood-ashes.
7. Harvest wheat before the straw becomes dry, or the grain hard.
8. Destroy weevil by lights in the field, on the pleasant evenings during the blossoming season.

WHORTLEBERRY.

Of this excellent berry there are several varieties, distinguished by the height of the bushes, or by the color of the fruit. The main divisions are, the *Swamp* and the *Plain Whortleberries*. The swamp variety has been transferred to gardens, in Michigan, and has proved valuable. The shrub attains considerable size, producing fruit more surely and regularly than in its wild state, and of an improved quality and larger size. It may be grown as well as currants all over the country. The small plain variety is usually found on sandy plains, and is a great bearer of fruit everywhere highly prized. It may be transferred to all our gardens, by making a bed of sand six inches or a foot deep, or it may be so acclimated as to grow well in any good garden soil, and become a universal luxury. We recommend it as a standing fruit for all gardens.

WILLOW.

The cultivation of willow for osier-work is pursued to some extent in this country, and might be greatly increased. At one fourth the present prices, it would pay as well as any other branch of agriculture. Some varieties will grow on land of little value for other purposes, and all on any good land. Willows will take care of themselves after the second or third year. The more usual method of planting is of slips, ten inches long, set in mellow ground

about eight inches deep, in straight rows four or six feet apart, and one foot apart in the rows—except the green willow, which is put two feet apart in the row. They should be kept clear of weeds for the first two years. The osiers are to be cut when the bark will peel somewhat easily, and may be put through a machine for the purpose, invented by J. Colby, of Jonesville, Vermont, at the rate of two tons per day, removing all the bark, without injuring the wood. Different opinions prevail respecting the varieties most profitable for cultivation; they vary in different localities. The manufacture of willow-ware will increase with the increased production of osiers, and the consequent reduction of their cost.

WINE.

We have elsewhere stated that our only hope for pure wine in this country is in domestic manufacture. We shall here give two recipes that will insure better articles than are now offered under the name of imported wines.

Currant Wine.—This, as usually manufactured, is a mere cordial, rather than a wine. The following recipe gathered from the *Working Farmer*, is all that need be desired, on making wine from currants, cherries, and most berries, that are not too sweet. Take clean ripe currants and pass them between two rollers, or in some other way, crush them, put them in a strong bag, and under a screw or weight, and the juice will be easily expressed. To each quart of this juice, add three pounds of *double-refined* loaf sugar (no other sugar will do) and water enough to make a gallon. Or in a cask that will hold thirty gallons, put thirty quarts of the juice, ninety pounds of the sugar, and fill to the bung with water. Put in the bung and roll the cask until you can not hear the sugar moving on the inside of the barrel, when it will all be dissolved. Next day roll it again, and place it in a cellar of very even temperature, and leave the bung out to allow fermentation. This will commence in two or three days and continue for a few weeks. Its presence may be known by a slight noise like that of soda water, which may be heard by placing the ear at the bung hole. When this ceases drive the bung tight and let it stand six months, when the wine may be drawn off and bottled, and will be perfectly clear and not too sweet. No alcohol should be added. Putting in brandies or other spirituous liquors prevents the fermentation of wine, leaving the mixture a mere cordial. The use of any but double-refined sugar is always injurious,

and yet many will persist in using it, because it is cheaper. The reason for discarding, for wine-making, all but double-refined sugar, may be easily understood. Common sugar contains one half of one per cent. of gum, that becomes fetid on being dissolved in water. The quantity of this gum in the sugar, for a barrel of wine, is considerable—enough to give a bad flavor to the wine. This is avoided by using double-refined sugar, which contains no gum. This recipe is equally good for cherry wine.

The following recipe for making *Elderberry Wine*, produces an article that the best judges in New York and elsewhere have pronounced equal to any imported wine. Its excellence has made quite a market for elderberries in New York. These berries are so easily grown, and the wine so excellent, that their growth will be encouraged throughout the country. It is not only an exceedingly palatable wine, but is better for the sick, than any other known.

To every quart of the berries, put a quart of water and boil for half an hour. Bruise them from the skin and strain, and to every gallon of the juice add three pounds of *double-refined* sugar and one quarter of an ounce of cream of tartar and boil for half an hour. Take a clean cask and put in it one pound of raisins to every three gallons of the wine, and a slice of toasted bread covered over with good yeast. When the wine has become quite cool, put it into the cask, and place it in a room of even temperature to ferment. When the fermentation has fully ceased, put the bung in tight. No brandy or alcohol of any kind will be necessary. Any one following this recipe *exactly*, will be surprised at the excellence of the wine that will be the result.

Of *Grape Wines*, there are several varieties, whose peculiarities are determined mainly by the process of manufacturing. A full treatment of the subject would require a volume. The following brief directions will insure success in making the most desirable grape wines:

1. Let the grapes become thoroughly ripe before gathering, to increase their saccharine qualities and make a stronger wine. All fruits make much better wine for being fully ripe. Cut the bunches with a sharp knife and move carefully to avoid bruising. Spread them in a dry shade to evaporate excessive moisture.
2. Assort the grapes before using, removing all decayed, green, or broken ones, using only perfect berries.

3. Mash the grapes with a beater in a tub, or by passing them through a cider-mill. "*Treading the wine vat*" was the ancient method of mashing the grapes, not now practised except in some parts of Europe.

4. To make light wines put them at once into press, as apple pomace in a cider-press.

5. To make higher-colored wines let the pomace stand from four to twenty-four hours before pressing. They will be dark in proportion to the length of time the pomace stands.

6. To make wines resembling the Austere wines of France and Spain, let the pomace stand until the first fermentation is over, called "fermenting in the skin."

7. The "must" or grape-juice is to be put into casks, the larger the better, but only one pressing should be put into one cask. Put in a cellar of even temperature, not lower than fifty nor higher than sixty-five degrees of Fahrenheit, and where there is plenty of air.

Prepare the cask by burning in it a strip of paper or muslin, dipped in melted sulphur, and suspended by a wire across the bung-hole. Fermentation commences very soon and will be completed within a few days or weeks according to the temperature. Its completion is marked by the cessation of the escape of gas. No sugar, brandy, or any other substance, should be added to the grape-juice to make good wine. They are all adulterations. The wine having settled after this fermentation, may be racked off into clean casks, prepared as before. A second fermentation will take place in the spring. It should not be bottled until after this second fermentation, as its expansion will break the glass. While in the casks they should always be kept full, being occasionally filled from a small cask, kept for the purpose. When this fermentation ceases, bottle and cork tight, and lay the bottles on their sides, in a cool cellar. The wine will improve with age.

Sometimes it remains on the lees without racking and is drawn off and bottled. Frequently the wine does not become wholly clear and needs fining. Various substances are used for this purpose, as fish-glue, charcoal, starch, rice, milk, &c. The best of these substances is charcoal, or the white of eggs and milk. Add by degrees according to the foulness of the wine. An ounce of

charcoal to a barrel of wine is an ordinary quantity; or a pint of milk with the white of four eggs—more or less according to the state of the wine.

Rhine Wine of Germany may be made as follows:—

Take good Catawba or Isabella grapes, and pound or grind them so as to crush every seed and leave them in that state for twenty-four hours. Fumigate the cask by burning strips of muslin dipped in sulphur as in the preceding recipe. Strain or press out the juice into the cask filling it and keeping it *entirely full*, that impurities may run out of the bung, during fermentation. In the spring prepare another cask in the same way and rack it off into that. When a year old bottle it and it is fit for use.

Sweeter wines than any of the above are made by adding sugar to the must before fermentation. It should be *double-refined* sugar, and still it is an adulteration.

WOODLANDS.

One of the greatest errors of American farmers is their neglect to cultivate groves of trees for woodlands, in all suitable places. Our primeval forests have been wantonly destroyed, and the country is not yet old enough to feel the full force of neglecting to replenish them, by new groves, in suitable localities. On the points of hills, rough stony places, sides of steep hills, ravines that can not be cultivated, and by the side of all the highways of the land, trees should be cultivated: in some places fruit-trees, but in most places forest-trees. The advantages would be manifold; they would afford shade for cattle, groves for birds, which would destroy the worms; they would break off the cold winds from crops, cattle, fruit-orchards, and dwellings; would greatly enrich the soil by their annual foliage, afford abundance of fuel at the cheapest rates, give much good timber, provide for fine maple-sugar, and be the greatest ornaments of the rural districts. Only think of the comfort and beauty of fifty miles square, in which not a street could be found which had not trees on each side, not more than twelve feet apart. When such trees should become twenty years old, the pedestrian or the carriage could move all day in the shade, listening to the music of the birds, and inhaling the aroma of the foliage or flowers. To every owner or occupant of the soil we say, plant trees.

POULTRY.

Fattening and preparing poultry for the market are important items in rural economy. Plenty of sweet food and pure water given at regular times, and the fowls not allowed to wander, are the requisites of successful fattening. The best feed for fattening fowls is oat-meal. Next to this is corn-meal. Three things are essential in food for fattening animals, flesh-forming, fat-forming, and heat-producing substances. Of all the grains ordinarily fed, oat-meal contains these in the best proportions, and next to this comes yellow Indian corn meal. Fat is good, but must be given in a hard form as in mutton or beef suet. Rice boiled in sweet milk, fed for a day or two before killing fowls is said to render the flesh of a white delicate color.

At least one third of the value of poultry in the market depends upon properly preparing and transporting it.

1. Do not feed fowls at all for twenty-four hours before killing them.
2. Kill by cutting the jugular vein with a sharp pen-knife, just under the sides of the head, and hang them up to bleed.
3. Pick carefully and very clean, without tearing the skin, and without scalding. Singe slightly if need be. Dip in hot water for three or four seconds and in cold water half a minute.
4. Do not open the breast at all, but remove the entrails from the hind opening, leaving the gizzard in its place. Put no water in but wipe out the blood with a dry cloth. Leaving the entrails in is injurious, tending to sour the meat and taint it with their flavor.
5. Do not allow your poultry to freeze by any means. For transporting to a distant market, pack in shallow boxes never containing over three hundred pounds each and in clean straw without chaff or dust, and in such a manner that no two fowls will touch each other.
6. Geese and ducks look better with the heads cut off. But all fowls having their heads removed must have the skin drawn down and tightly tied over the end of the neck bone. This will preserve them well and give a good appearance.

To preserve fowls for a long time in a perfectly sweet condition for family use, fill them half full or more with pulverized charcoal, which will act as an absorbent and prevent every particle of taint.

AGRICULTURAL PERIODICALS.

The following list of Agricultural Periodicals embraces all that have come to our knowledge. In a subsequent edition we shall endeavor to render the list more complete, and give the special design of each, with the frequency of publication, form, price, editor's and publisher's names, etc.

NAME OF PAPER.	PLACE OF PUBLICATION.
American Farmers' Magazine	<i>New York City.</i>
American Farmer	<i>Baltimore, Md.</i>
Alabama Planter	<i>Mobile, Ala.</i>
American Agriculturist	<i>New York City.</i>
Canadian Agriculturist	<i>Toronto, C. W.</i>
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Homestead	<i>Hartford, Ct.</i>
Journal of	<i>Chicago, Ill.</i>

Agriculture	
Maine Farmer	<i>Augusta, Me.</i>
Michigan Farmer	<i>Detroit, Mich.</i>
Magazine of Horticulture	<i>Boston, Mass.</i>
Massachusetts Ploughman	<i>Boston, Mass.</i>
New England Farmer	<i>Boston, Mass.</i>
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Working Farmer	<i>New York City.</i>



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