

J.H.WALDEN

SOIL CULTURE

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Soil Culture; Containing a Comprehensive View of Agriculture, Horticulture, Pomology, Domestic Animals, Rural Economy, and Agricultural Literature:

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J. H. Walden
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a Comprehensive View of
Agriculture, Horticulture,
Pomology, Domestic Animals,
Rural Economy, and
Agricultural Literature

*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.*

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
Silica	0.85	0.400	0.200
Soluble silica	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.

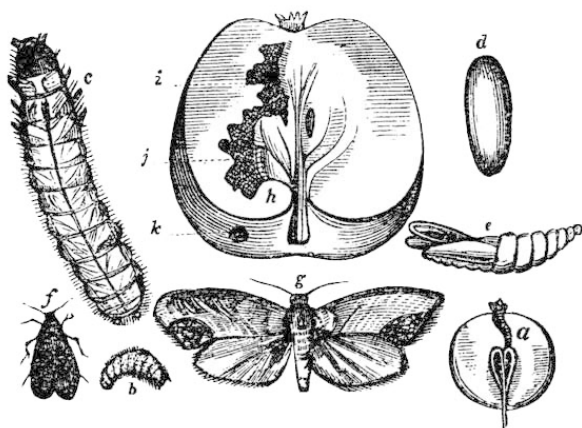
Enemies.—There are several of these that are quite destructive, when not properly guarded against. Two things are necessary, and, united and thoroughly performed, they afford a remedy or a preventive for most of the depredations of all insects: 1. Keep the trees well cleared of all rough, loose bark,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

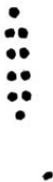
Woolly aphis—called in Europe by the misnomer, *American blight*—is very destructive across the water, but does not exist extensively on this side. It is supposed to exist, in this country, only where it has been introduced with imported trees. It appears as a white downy substance in the small forks 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.

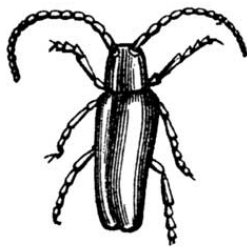
On nursery-trees their attacks may be prevented by washing with a solution of potash—two pounds in eight quarts of water. As this is a good manure, as well as a great remedy for insects, it had better be used every season.



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 deposit 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 Peamain.	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.

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 Oldenburgh.	Rhode Island Greening.
Keswick Codlin.	Baldwin.
Hawthornden.	Winthrop Greening.
Gravenstein.	Danvers Winter-Sweet.
Mother.	Ribston Pippin.
Tolman Sweet.	Roxberry Russet.

APPLES FOR THE WESTERN STATES,

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

Early Harvest.	Domine.
Carolina Red June.	Swaar.
Red Astrachan.	Westfield Seek-no-further.
American Summer Pearmain.	Broadwell.
Sweet June.	Vandevere of New York, or Newtown Spitzenburg.
Large Sweet Bough.	Ortly, or White Bellflower.
Summer Queen.	Yellow Bellflower.
Maiden's Blush.	White Pippin.
Keswick Codlin.	American Golden Russet.
Fall Wine.	Herfordshire Pearmain.
Rambo.	White Pearmain.
Belmont.	Wine Sap.
Fall Pippin.	Rawle's Janet.
Fameuse.	Red Canada.

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.

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.*

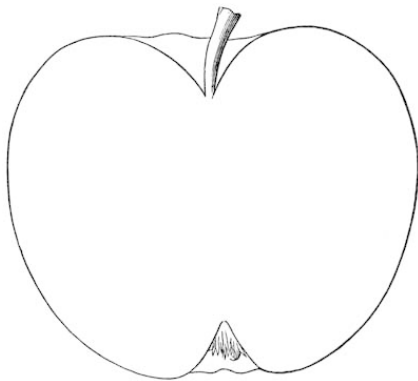
On a given parallel of latitude, a man may happen to plant a tree upon a fine calcareous soil, and it does well. Another chances to plant one upon a soil of a different character, and it does not succeed. It is then proclaimed that fruit succeeds well in one locality, and is useless in another near by 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.

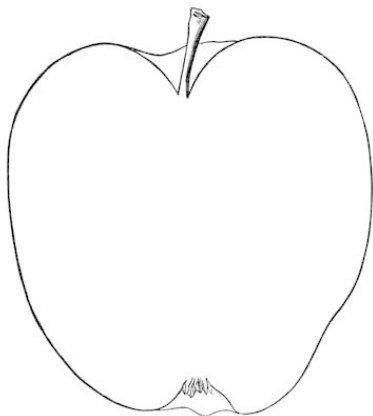


Stands at the head of all apples, in the Boston market. Fruit large and handsome. Tree hardy, and an abundant bearer. It is of the family of Esopus Spitzenburg. Yellowish white flesh, crisp and beautiful flavor, from a mingling of the acid and saccharine. Season, from November to March. On some rich 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.

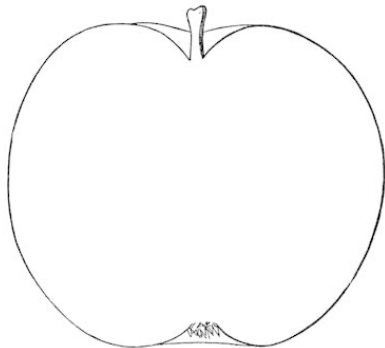
An old fruit in Massachusetts and Connecticut. Tree not a great grower, but a profuse bearer. Good in Ohio, Michigan, and other Western states. Retains its fine flavor to the last. January to May.

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.

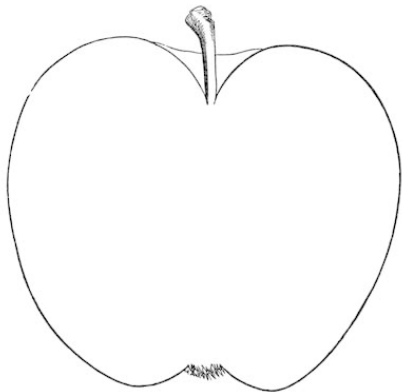
Early Harvest.—*Synonyms*—Early French Reinette, Prince's Harvest, July Pippin, Yellow Harvest, Large White Juneating, Tart Bough.



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.

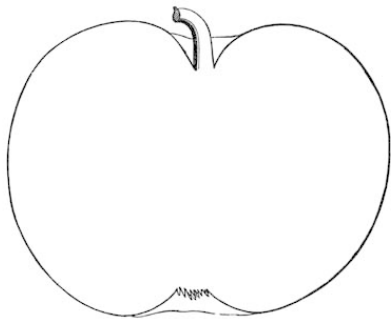


Large, fine flavored, lively red fruit. It is everywhere well known, as one of the very best apples ever cultivated, both for cooking and the desert. December to February, and often good even into April. A very great bearer.

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.

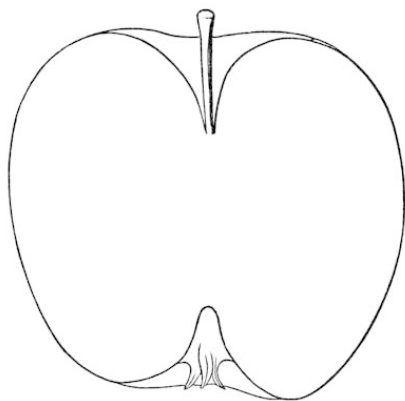
From North Carolina. Fruit large, from light to dark red. Flesh yellow, subacid, rich, and delicious. Tree hardy, vigorous, and an early and abundant bearer.

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

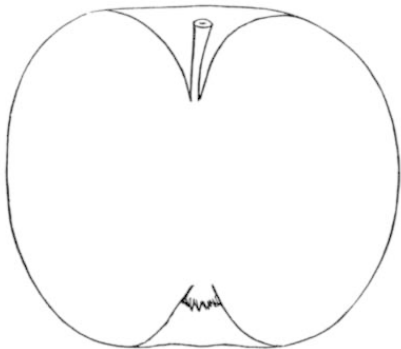
West, that it is one of the very best.

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.

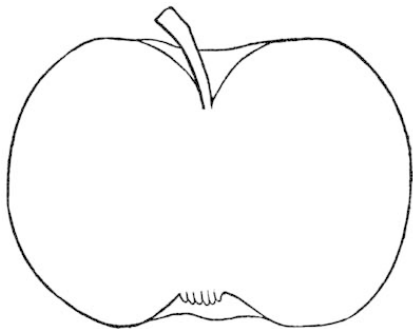
The yellow pippin, is another variety nearly as good.

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.

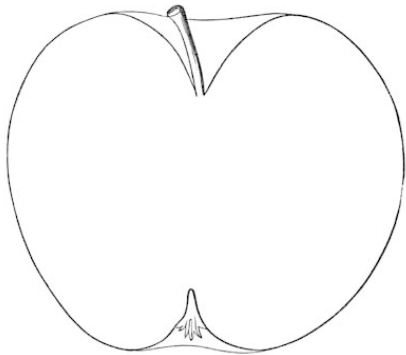
Rambo.—*Synonyms*—Romanite, Bread and cheese apple, Seek-no-further.



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.

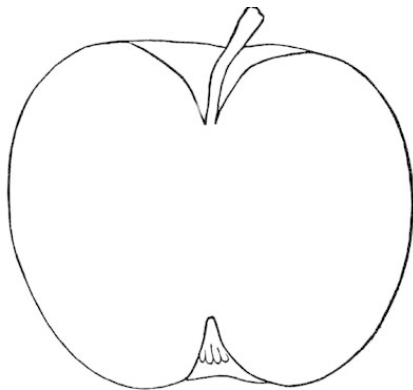


Fruit large, yellow, ground shaded, and striped with red, and sprinkled with little dots. Flesh yellowish, juicy, tender, subacid. Bears every year a great crop of very large showy apples. It is not superior in flesh or flavor, but keeps and sells very well. Always must be very profitable, and hence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

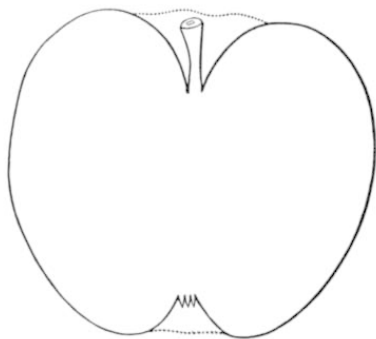


Fruit large, pale dull red, sprinkled with obscure russet yellow dots. Flesh white, tender and fine-grained. On all accounts good. October to February according to Downing. Elliott says from December to February. But the doctors often disagree. So you had better eat your apples when they are good, whether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

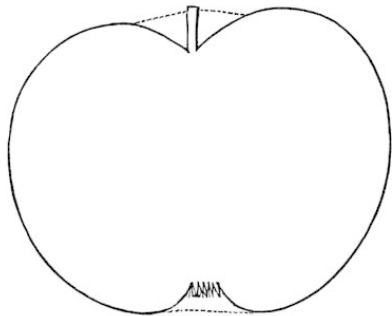
This occupies as high a place in England, as any other apple. In this country, two or three others, as Baldwin and Newtown Pippin, are more highly esteemed. This is most successfully grown in the colder parts of the United States and Canada. Fruit medium, deep yellow, firm, crisp; flavor sharp aromatic.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



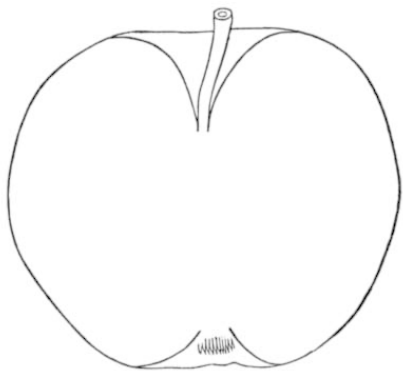
An excellent fruit, and prodigious bearer. Medium size, flesh greenish white, rather juicy, and subacid. Good in January, and one of the best in market in June.

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.

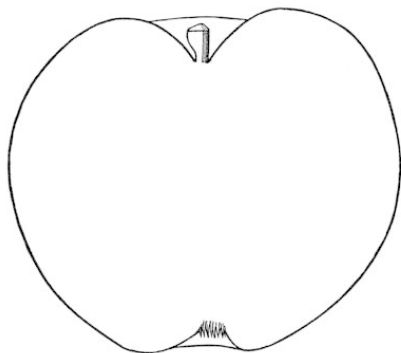


Fruit is large, and when fully ripe, of a dead gold color, dotted with many brown specks. Flesh yellowish, fine grained, and tender. Flavor aromatic and exceedingly rich. Bears good crops. December to March.

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



Barberries.

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 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.

BEES 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

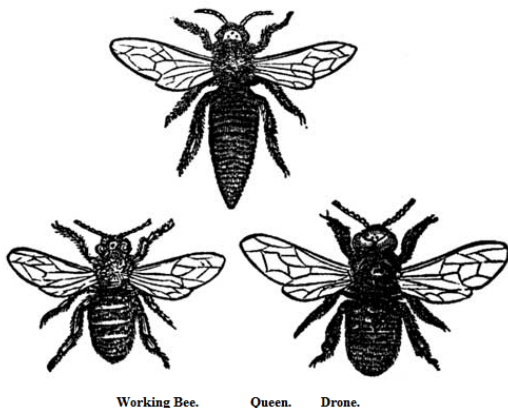
cells. And as bees build their cells the right size at first, it is probable they keep them so. Quinby assures us that bees have been grown twenty years in the same comb, and that the last were as large as the first. But for other reasons, it is better to change the comb. In all ordinary cases, it is 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 stunted 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

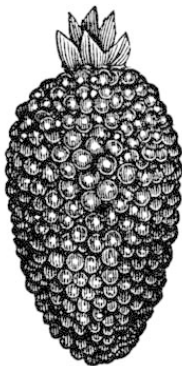
These are exceedingly useful in destroying insects. So of toads and bats. No one should ever be wantonly killed. Boys, old or young, should never be allowed to shoot birds, or disturb their nests, only as they would domestic fowls, for actual use. A wanton recklessness is exhibited about our cities and 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.

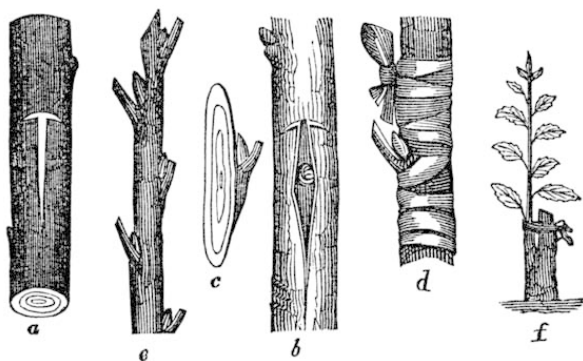
BUCKWHEAT

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.

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