





THE
AMERICAN ORCHARDIST;

OR

A PRACTICAL TREATISE ON THE CULTURE AND MANAGEMENT OF
APPLE AND OTHER FRUIT TREES,
WITH OBSERVATIONS ON THE DISEASES TO WHICH THEY ARE
LIABLE, AND THEIR REMEDIES. TO WHICH IS ADDED THE
MOST APPROVED METHOD OF MANUFACTURING AND
PRESERVING CIDER, AND ALSO WINE FROM
APPLE JUICE AND CURRANTS.

Adapted to the use of

AMERICAN FARMERS,

AND ALL LOVERS AND CULTIVATORS OF

FINE FRUIT.



BY JAMES THACHER, M. D.

Fellow of the American Academy of Arts and Sciences;
Honorary Member of the Massachusetts Medical Society,
and of the New-York Horticultural Society, &c.

SECOND EDITION, MUCH IMPROVED.

“Nature in her teaching speaks in very intelligible language,
and that language is conveyed by experience and observation.”

PLYMOUTH, MASS.

PUBLISHED BY EZRA COLLIER.

1825.

DISTRICT OF MASSACHUSETTS, TO WIT :

DISTRICT CLERK'S OFFICE.

BE it remembered, That on the twenty-fourth day of October, A. D. 1825, in the fiftieth year of the Independence of the United States of America, Ezra Collier, of the said District, has deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit :

"The American Orchardist ; or a practical treatise on the culture and management of apple and other fruit trees, with observations on the diseases to which they are liable, and their remedies. To which is added the most approved method of manufacturing and preserving cider, and also wine from apple juice and currants. Adapted to the use of American Farmers, and all lovers and cultivators of fine fruit. By James Thacher, M. D. Fellow of the American Academy of Arts and Sciences ; Honorary Member of the Massachusetts Medical Society, and the New-York Horticultural Society, &c. Second edition, much improved. 'Nature in her teaching speaks in very intelligible language, and that language is conveyed by experience and observation.'"

In conformity to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of Maps, Charts and Books, to the authors and proprietors of such copies, during the times therein mentioned :"
and also to an act, entitled "An act supplementary to an act, entitled, An act for the encouragement of learning, by securing the copies of Maps, Charts and Books, to the authors and proprietors of such copies during the times therein mentioned ; and extending the benefits thereof to the arts of Designing, Engraving and Etching Historical and other Prints."

JNO. W. DAVIS,

Clerk of the District of Massachusetts.

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TO THE

**PRESIDENT AND OTHER OFFICERS OF THE
MASSACHUSETTS AGRICULTURAL SOCIETY.**

GENTLEMEN :

PRESUMING upon your acquiescence, I introduce to your notice this little practical treatise upon one of the most interesting and pleasing branches pertaining to the science of agriculture. The utility of a cheap publication of this kind, for the information and encouragement of our farmers, is unquestionable. If this humble attempt should meet your approbation, and be found to possess a degree of merit calculated to co-operate with your zealous efforts to promote agricultural pursuits and improvements in our country, a knowledge of your character is an ample pledge that you will not withhold your patronage and favour. If, however, it shall appear that I have subjected myself to the accusation of having stepped beyond the limits, within which my actual knowledge should be confined, then will a consciousness of laudable motives, of assiduity and fidelity in the collection of experimental facts, remain as my only consolation. I am not unapprized of the almost invincible prejudice, which prevails among our farmers, against what they term "book-farming," "book-knowledge," &c. &c. ; and the anecdote is fresh in my memory, of an honest farmer, who, on being inquired of Why his neighbour's farm was not productive, replied, "because he has *booked* it to death." These prejudices exist chiefly among those, whose minds are unenlightened, and views unexpanded by that useful knowledge, which is only to be acquired by reading. It must be conceded that almost all improvements are derived from the records of practice and observation ; and when we have reason and experience to support, and plain facts to confirm, we may become less tenacious of the rules of our fathers, believing that it may be the reserved privilege of the children, to acquire the skill of producing two spires of grass where their fathers produced but one. It is a remarkable fact that the first planters bequeathed to their posterity a greater number of or-

chards, in proportion to their population, than are now to be found in the old colony ; and it is no less notorious that the children have substituted a poisonous liquor for the salutary beverage, which almost exclusively cheered the hearts of their virtuous ancestors. The views of men are often materially affected through mere indolence of temper, no less than through the cloud of prejudice. Averse to the labour of reading and inquiry, they adhere pertinaciously to the routine of their predecessors, and treat with equal contempt the lessons of experience, and all suggestions of improvement. It is not, however, desirable that former modes of practice in husbandry should be abandoned until it shall be incontestably proved, that a system more adapted to our circumstances, and in all respects of superiour utility, can be founded on the surest basis. It is not to be required of our farmers to subject themselves to the expense and uncertainty of novel experiments ; but he who possesses capital and leisure, and who, in the spirit of investigation, shall put in execution a hundred new projects, although in ten only shall he be successful in the acquisition of useful knowledge, will be entitled to public praise and respect. These pages contain no speculative or visionary projects, nor recommend any untried experiments. Although a portion of information is derived from European authors, no inconsiderable part of it has been collected from the practical experiments and observations of our own countrymen. There is, therefore, no part of this production but what may be adopted as applicable to our climate, and calculated to promote the interests of the cultivators of our soil. The knowledge respecting the proper management of fruit trees is contained in numerous volumes, and in incidental papers, published in periodical works. My object has been to collate and embrace all the principal circumstances relative to the subject, and condense the whole into a small compass, that shall be accessible both to the pecuniary means of all, and to the intellectual powers of the most ordinary capacity. The authorities to which I am chiefly indebted, are the several Encyclopedias, Forsyth on Fruit Trees, and the valuable periodical publications of your society, and various other similar productions. If, in a few instances, it shall appear that I have employed borrowed language without marks of quotation, my apology is, that I have copied from minutes collected at various times, without reference to the source whence derived ; not that I would wittingly pilfer the cultivated fruit of others, and impose it upon my guests as the result of my own industry.

Nothing can be more irksome to a reflecting mind than a state

of inactivity and idleness. I have devoted some of my leisure hours to the subject of this treatise, and have derived from the employment both recreation and improvement. Should the book share the fate of many others, and pass into neglect and oblivion, it will not be a cause of chagrin ; but if it should be so fortunate as to rise into popularity, and arrest the attention of our farmers, who may be assured that a little "book-knowledge" will do them no harm, it will be a source of the highest gratification.

The Massachusetts Agricultural Society, through your agency, gentlemen, has already exerted a happy influence, tending to eradicate former prejudices, and greatly to ameliorate the condition of our husbandry in its various branches.

With the view of encouraging a familiarity with agricultural books among our farmers, permit me to suggest the expediency of supplying our several county societies with the Massachusetts Agricultural Repository, on the most favourable terms for distribution ; and also of paying, in certain proportions, your annual premiums in cheap books on agricultural subjects.

That you may long continue to enjoy the satisfaction to be derived from your patriotick labours, is the fervent desire of

Your humble and obedient servant,

JAMES THACHER.

PLYMOUTH, JULY, 1821.

RECOMMENDATION.

THE gentlemen who sign the following Recommendation are officers of the Massachusetts Agricultural Society, although they do not subscribe as such ; but cheerfully consent, as individuals, to honour the publication with the following testimony of their approbation.

BOSTON, SEPTEMBER 10, 1821.

WE have perused, at the request of Dr. Thacher, his Treatise on the Culture of Fruit Trees, and the Art of Making Cider ; and, although we cannot hope that our opinions will have any great weight with the publick, yet, as the author is desirous that we should express them, we have no hesitation in saying, that it appears to us an excellent compendium of all that has been written on the subject—comprising, within a moderate compass, the result of the observations of the experienced cultivators of Europe, and of this country—with many original suggestions of his own—and we believe that such a work will be of great value to those, who wish to obtain a knowledge of this branch of agriculture, but who cannot have access to the original sources, from which, with great labour, and, as we believe, good judgment, this compilation has been formed.

[Names of the gentlemen who, as individuals, sign the above recommendation ; with the addition of their titles, as copied from the Massachusetts Agricultural Journal.]

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Preface to the Second Edition.

THE AMERICAN ORCHARDIST having been honoured by the publick approbation, as evinced by the early disposal of the first edition, the author is encouraged to prepare for the press a new edition, containing many improvements, and considerable additional matter. This little volume will not be found deficient in any requisite to gratify the wishes of those who may be desirous to select the most advantageous and eligible method of cultivating the finest fruits, and of preparing the valuable liquors which they are known to afford. Much attention has been bestowed also, in forming a correct catalogue of the most approved varieties of fruit, with the peculiar qualities which they possess, that the purchaser may with facility make his selection of such as are in highest repute among our most experienced connoisseurs. It has been a primary object to compress the whole in so small a compass, that the price of the book may not be enhanced, while its contents shall be rendered no less completely adapted to the use of our farmers and cultivators, than any similar work which has hitherto been offered to the publick. While the author would most respectfully proffer his grateful acknowledgements for publick honours and patronage, he flatters himself with the hope that no one will ever have cause to regret that he contributes to the remuneration of persevering industry by purchasing a copy of the *American Orchardist*.

PLYMOUTH, OCT. 1825.

N. B. It is from a sense of justice and respect that I embrace this occasion to acknowledge, that in the first edition of this work, an error was inadvertently committed, as respects the venerable Timothy Pickering, Esq. In the several pages 16, 17, 21, 45, language and sentiments are ascribed to him, which I now learn were derived from a different source; and in the present edition, pages 16, 18, 22, 49, the same errors were reprinted previous to my receiving that gentleman's disavowal. The circumstance is to be explained as follows: While compiling the first edition and searching every source for materials, I found in the Massachusetts Agricultural Journal, vol. 3, page 39, an anonymous production "*On the culture of Trees.*" By some means which I cannot at present recollect, I received the impression that it came from the pen of Col. Pickering, and was induced to avail myself of the supposed authority accordingly. I am now authorised and requested to assert that Col. Pickering disclaims all knowledge of whatever is ascribed to him in the several pages above mentioned.

DEDICATION.

TO JOHN LOWELL, ESQ.

President of the Massachusetts Agricultural Society—the generous patron of systematick agriculture, to whom the science is indebted for indefatigable labours and useful achievements :

This second edition is, with

great respect and consideration,

dedicated by his

humble servant,

THE AUTHOR.

THE

AMERICAN ORCHARDIST.



“And the Lord took the man and put him in the garden of Eden to *dress* it and to keep it.” Saying, “In the sweat of thy face shalt thou eat bread, till thou return unto the ground.”

“*What a luxury do the sons of sloth lose.*”—Harvey.

Rise early to your orchard and garden. See if your trees and plants flourish—listen to the chirping of the joyous birds—cultivate rural pleasures, and health, vigor and comfort will most assuredly be your portion.



APPLE TREES.

AMONG the numerous varieties of fruit-bearing trees, cultivated in our country, the apple is, confessedly, of superiour importance and utility. Whether considered as an esculent for the dessert, as an article for culinary purposes, or as affording a pleasant and wholesome beverage, this fruit is not to be surpassed in excellence. If the productions of tropical climates are valued for their grateful and delicious qualities, the apple, more permanent and durable, and possessing nutritive and salubrious properties, is incomparably of the greatest estimation. From a natural and happy gradation, this fruit attains to full growth, in

successive order, during summer and autumn; and, acquiring greater perfection and maturity after gathering, it may, by proper care, be preserved for the table, or for culinary use, until the return of the flowering season. The soil and climate of the United States are admirably adapted to the growth of the apple tree, except in certain districts in the south, where the land is level and sandy, and the atmosphere replete with humidity. Even the colder regions of Maine annually furnish excellent apples for the Boston market. We have an ample variety of apples, many of which are allowed to be of superiour quality as to size, beauty and flavour. Notwithstanding, however, these advantages, and the immense value of apple orchards, their cultivation has received but inadequate attention from the farmers of our country. It must be confessed, as a notorious truth, that an orchard, planted and cultivated in the most advantageous manner in point of beauty, profit, and convenience, is scarcely to be found in the sphere of our observation. The most palpable neglect prevails in respect of proper pruning, cleaning, and manuring round the roots of trees, and of perpetuating choice fruit, by engrafting from it on other stocks. Old orchards are, in general, in a state of rapid decay; and it is not uncommon to see valuable and thrifty trees exposed to the depredations of cattle and sheep, and their foliage annoyed by caterpillars and other destructive insects. In fact, we know of no branch of agriculture so unaccountably and so culpably disregarded. If it be objected, that the profit will not remunerate for the labour and expense of cultivation, the obvious reply is, let the experiment be fairly tried, in a few instances, and the result will soon correct the erroneous impression, and stimulate to greater attention to the subject. It may, with propriety, be affirmed, that a judiciously-cultivated orchard of select fruit, if situated

at a convenient distance from a large town or village, would yield an annual profit equal to any production of the industrious husbandman. An instance has been adduced, in the town of Dorchester, a few years since, of one hundred and sixty barrels of apples being produced from less than two acres, the estimated value of which, including the grass mowed under the trees, is three hundred dollars per acre. In what branch of culture can the husbandman realize a more ample and gratifying reward for his labour and attention?

It is a circumstance encouraging to the cultivator, that, "in addition to the usual markets, a very considerable export has taken place lately to Europe, and that the flavour of our apples is highly estimated there." In every rural establishment, a fruit orchard should be considered an indispensable appendage, as a source of real emolument, and as contributing to health, pleasure, and recreation. It will be conceded, that, in the whole department of rural economy, there is not a more noble, interesting, and beautiful exhibition, than a fruit orchard, systematically arranged, while clothed with nature's foliage, and decorated with variegated blossoms perfuming the air, or when bending under a load of ripe fruit of many varieties. It is among the excellences of a fruit orchard, that it affords a salubrious *beverage*, an adequate supply of which would have a happy tendency to diminish, if not supersede, the consumption of ardent spirits, so destructive to the health and moral character of our citizens. "The palate," says Mr. Knight, an English horticulturalist, "which relishes fruit, is seldom pleased with strong fermented liquors; and, as feeble causes, continually acting, ultimately produce extensive effects, the supplying the publick with fruit, at a cheap rate, would have a tendency to operate favourably, both on the physical and moral health of the people." It is presumable, that the period is not far distant, when

the subject of horticulture will receive its merited attention, and the value and utility of fruit orchards be duly appreciated by all ranks of our citizens ; and it will be to me a source of pride and satisfaction, should these pages contribute, in any degree, to the promotion of the desirable object. The most eligible and approved method of propagating fruit trees, some account of the numerous insects which infest and prey upon their vitals, with the various diseases to which they are liable, and which prove fatal to their existence, and the best adapted remedies, will constitute the principal topics of this undertaking. While philosophers pride themselves upon vain speculation, the practical farmer will be contented with plain facts, from whatever source derived. Leaving to others, therefore, the task of wandering in the perplexing mazes of theory, suffice it here to excite, in the orchardist and farmer, the spirit of practical activity, and to stimulate by the lessons of attentive and intelligent men ; for "nature, in her teaching, speaks in very intelligible language, and that language is conveyed by experience and observation." No apology will be urged for any inelegance of style, as perspicuity and brevity are conceived to be more acceptable requisites, in the view of the respectable cultivators of our soil, for whose use this little work is intended.

PHYSICAL PROPERTIES OF APPLES.

"In diseases of the breast, says Dr. Willich (Dom. Ency.) such as catarrhs, coughs, consumptions, &c. they are of considerable service. For these beneficial purposes, however, they ought not to be eaten raw, but either roasted, stewed, or boiled. They may also be usefully employed in decoctions, which, if drank plentifully, tend to abate febrile heat, as well as to relieve painful strictures in pectoral complaints. With

regard to their sensible properties, apples have been divided into spicy, acidulated, and watery. To the first class belong the various species of rennet, which possess a most delicate flavour, contain the least proportion of water, and, on account of their vinous nature, are not apt to excite flatulency. Pippins, on the contrary, though affording more nutriment than the former, are more fibrous, and, consequently, require a more vigorous stomach to digest them; hence they should be ranked under the second class. Lastly, those sweet and tender apples which are very juicy and palatable, are the least fit to be eaten in a raw state, unless with the addition of bread or biscuit. When baked, or dried in the open air, they make an excellent substitute for raisins or plums, in puddings, pies, and other dishes prepared of flour. Sour apples may be much improved, both in taste and quality, by either baking or digesting them in a close vessel, by steam, over a slow fire. Thus the saccharine principle is disengaged, and they undergo a speedy and complete change." The honourable T. Pickering, in his address to the agricultural society, Essex county, expresses himself in the following language: "After providing a due proportion of apples for the table and the ordinary purposes of cookery, I do not hesitate to express my opinion, that, for all other uses, sweet apples are entitled to the preference. The best cider I ever tasted, in this country, was made wholly of sweet apples. They afford also a nourishing food to man and all domestick animals. What furnishes a more delicious repast than a rich sweet apple baked and eaten in milk? I recollect the observation made to me by an observing farmer, before the American revolution, that nothing would fatten cattle faster than sweet apples. Mentioning this, a few years since, to a gentleman of my acquaintance in an adjoining state, he informed me, that he was once advised to give

sweet apples to a sick horse. Happening then to have them in plenty, the horse was served with them, and he soon got well, and, continuing to be fed with them, he fattened faster than any other horse that he had ever owned that was fed with any other food. Mentioning to the same gentleman, what I had long before heard, that a good molasses might be made of sweet apples, he confirmed the fact by an instance within his own knowledge, &c. &c. The process is very simple. The apples being ground, and the juice expressed at the cider mills, it is immediately boiled; and the scum being taken off, the boiling is continued until the liquor acquires the consistence of molasses."

Mr. Knight, an English gentleman, in his treatise on the apple and pear, says that the juice of these fruits might be used with great advantage on long voyages. He has frequently reduced it by boiling to the consistence of a weak jelly, and in this state it has remained several years without the slightest apparent change, though it has been intentionally exposed to much variation of temperature. A large quantity of the inspissated juice would occupy but a very small space; and the addition of a few pounds of it to a hog-head of water would probably at any time form a good liquor similar to cider or perry. It might also, he thinks, be used to supply the place of rob of lemons and oranges, and might be obtained at a much lower price.

I avail myself of the following appropriate sentence, in the language of one who has long been eminently distinguished for his numerous patriotick and amiable virtues.*

"When we consider the various manners in which fruits are beneficial; when we recollect the pleasure

* See a letter on fruit trees, by a member of the Kennebeck agricultural society, published in papers on agriculture. Mass. society, 1804.

they afford to the senses, and the chaste and innocent occupation which they give in their cultivation; when we consider the reputation which they communicate to a country in the eye of strangers, especially as affording a test of its climate and industry; when we remember the importance of improving the beverage which they are intended to supply; when it is calculated under how many solid forms they may be exported (as dried, baked, and preserved, as well as in their natural state;) and lastly, when we reflect upon the utility of giving to our rural labours a thoughtful turn, which is the best substitute now left, after having quitted our primeval state; I say, when we consider these things, it will appear that the subject of fruits, which were the first earthly gift of Providence to man in his more favoured state, may well continue to merit both the publick and individual attention."

ORIGINAL STOCK.

It is the opinion of botanists, "that the wilding, or *crab-apple* of the woods and hedges, is the original kind from the seeds of which the apple now cultivated was first obtained. The varieties of this species are multiplied to some hundreds, in different places, all having been first accidentally procured from the seed or kernels of the fruit, and then increased by grafting upon *crabs* or other kinds of apple stocks." (Dom. Ency.) The crab is still considered as a proper stock to receive the grafts of the more valuable varieties, and is even preferred by some cultivators as being more hardy, better able to endure cold and coarse land; and they also take firmer root, are of more rapid growth, and make larger trees.

This tree may be found in forests, and other uncultivated places. Its stems and branches are armed with sharp thorns, and its fruit is small, and so extremely

acid and unpleasant, that it is not edible in its natural state. The following description by Mr. William Bartram, is copied from Mease's edition of the domestic encyclopedia. "The *pyrus coronaria*, or native crab apple of North America, is not eaten, except when preserved in sugar, and in this state, they are deservedly esteemed as a great delicacy. The fruit is flat-tish, above one inch in diameter, yellow when ripe, or of the colour of polished brass, and possesses an agreeable fragrancly. Perhaps no tree presents a more gay appearance in the spring, when dressed in green, and with clusters of flowers of a most pleasing blush. The petals may be compared to flakes of white wax, faintly tinged with the finest carmine; though some trees have flowers of a damask rose colour." The honourable Timothy Pickering, from long experience, observes, "to bring an orchard as early as possible into profit, plant common wild trees, or what are commonly called crab apples, four or five years old. They should be cut down as soon as planted, and on their young shoots graft or inoculate such fruit as is desired. From this practice, more fruit will be obtained in ten years, than in the usual way in twenty years. The wild tree, if grafted on its own stock, will come much earlier to bearing fruit, and it will be improved both in size and flavour."

CULTIVATED OR SEEDLING STOCKS.

When the crab stock cannot be procured in sufficient quantity for the purpose of propagation, it becomes necessary to resort to the expedient of culture from the seeds. Seedling stocks, which have a natural tendency to attain the full height of the species to be grafted on them, are generally denominated *free stocks*. Every planter who is solicitous to keep an orchard well stocked with fruit trees, should cultivate

in a nursery his own free stocks, and graft for himself, that he may realize all the advantages to be derived from a knowledge of the soil and the peculiar properties of his trees, and thereby avoid many impositions practised by ignorant and artful nursery-men. He will moreover be enabled to select such stocks for grafting, as experience shows to be best adapted to the soil and climate of his plantation, and which meet his own particular views. Trees raised from seed rarely produce the same *species* of fruit with that from which the kernels were taken, yet they are well adapted as stocks for grafting, and it occasionally happens that a new and valuable variety is thus produced, either for cider, or for the dessert. An accurate observer, Mr. Joseph Cooper, of New-Jersey, asserts, (Dom. Ency. Mease's edit.) that experience, for more than fifty years, has convinced him, that, although seedlings from apples will scarcely ever produce fruit exactly similar to the original, yet many of them will produce excellent fruit: some will even be superiour to the apples from which the seeds are taken. This fact has led him to plant seeds from the largest and best kinds of fruit, and from trees of a strong and rapid growth, and let all the young trees bear fruit before grafting, which produce uncommon strong shoots or a large rich-looking leaf. He has seldom known them fail of bearing fruit having some good quality; at all events they make a stock to receive the grafts of any good kind which may present itself. Those sprouts or suckers which originate from the roots of ungrafted trees, if transplanted, will produce the same kind of fruit with the parent stock, though trees thus propagated are very apt to generate suckers, and they do not come to a bearing state so soon by several years as engrafted trees. This was probably the mode of propagating fruit trees before the art of engrafting was discovered. Select fruit may be propagated in the

following manner:—Take a scion from a tree, the growth of the preceding year. Cut this scion into pieces of three or four inches in length, dip the ends in warm rosin or wax so as to prevent the sap issuing out—plant the pieces in a good moist soil. A number of shoots will spring up; from these, select the most thrifty for growth; lop down the remaining shoots and cover them well with earth, and in a short time they will become roots to nourish and hasten the growth of the thrifty shoots into trees. By this method, select fruit, either apple or pear, may be produced at least two years sooner than from ungrafted seedlings.

BEST ADAPTED SOIL.

The apple tree will thrive and flourish in many different sorts of soil; but a dry friable loam should probably be preferred, as too much moisture is known to be injurious to the roots. Such soil as produces good crops of corn or grass, will, in general, afford the requisite and best adapted nutriment to apple or pear trees. The soil should not only be rich, but have a good depth, not less perhaps than two or three feet. It has been remarked as a fact, that, in each particular place, certain kinds of apples have been observed to succeed better than other kinds; and, according to the observations of the honourable Timothy Pickering, many different sorts will flourish on an acre of ground, when the same number of one sort would starve. When, therefore, the cultivator has discovered the varieties most congenial to the soil and situation he occupies, it should be his endeavour to encourage them, by multiplying the grafts on his unproductive trees, or by forming new additional trees by grafting on other stocks.

PRODUCTION OF NEW VARIETIES.

The apple tree does not enjoy indefinite longevity. Each species has its periods of infancy, youth, maturity, and decrepit age; and, in process of time, it is totally annihilated; nor is it in the power of art to protract its existence beyond its limited duration. Hence we frequently hear the complaint, that many varieties of apple, formerly held in high estimation, are no longer to be obtained, having entirely *run out*, as it is termed. The seeds of apples, however, contain the germ of an infinite variety of fruit. New varieties, and some of excellent quality, are continually produced from seeds. The famous winter pippin was the spontaneous production from a seed at Newtown, Long Island. But there is no dependence upon obtaining a particular variety by planting the seeds. "A hundred seeds of the golden pippin will all produce fine large-leaved apple trees, bearing fruit of considerable size; but the tastes and colours of the apple from each will be different, and none will be the same in kind with those of the pippin itself. Some will be sweet, some bitter, some sour, some mawkish, some aromack, some yellow, some green, some red, some streaked." The seeds for planting, should always be selected from the most highly cultivated fruit, and the fairest and ripest specimen of such variety. In some instances, a new and valuable variety may thus be obtained, and the seedlings will afford some indication of their future produce, even before they attain to their bearing state. The larger and thicker the leaves of a seedling, and the more expanded its blossoms, the more likely it is to produce a good variety of fruit. Short-leaved trees should never be selected, for these approach nearer to the original standard; whereas the other qualities indicate the influence of cultivation. Every fruit tree must attain to a certain age before it

can bear fruit. An apple tree from the seed requires to be twelve or fifteen years old before it will produce fruit in perfection ; but a method will be hereafter described by which particular branches may be forced to produce blossoms and fruit at an earlier period, and their quality sooner ascertained.

The following are the sentiments of Mr. Knight, an experienced English horticulturalist, (Edin. Ency. Amer. edit. article horticulture.) All the extensions, he observes, by means of grafts and buds, must naturally partake of the qualities of the original. Where the original is old, there must be inherent in the derivatives the tendency to decay incident to old age. It is not to be understood, however, that a graft cannot survive the trunk from which it was taken : this would be deemed absurd. It may indeed be assumed as a fact, that a *variety or kind of fruit*, such as the golden pippin or the ribston, is equivalent only to an *individual*. By careful management the health and life of this individual may be prolonged ; and grafts placed on vigorous stocks and nursed in favourable situations, may long survive the parent plant or original ungrafted tree. Still there is a progress to extinction, and the only renewal of an individual, the only true reproduction, is by seed. As the production of new varieties of fruit from the seed, is a subject which now very much occupies the attention of horticulturalists, it may be proper here to state the precautions adopted by Mr. Knight and others in conducting their trials. It is in the first place a rule to take the seeds of the finest kinds of fruit, and from the ripest, largest and best flavoured specimens of that fruit. When Mr. K. wished to procure some of the old apples in a healthy and renovated state, he adopted the following method : He prepared stocks of the best kind of apple that could be propagated by cuttings, and planted them against a south wall in a very

rich soil. These were next year grafted with the stire, golden pippin, or some other fine old kind. In the course of the following winter the young trees were dug up, and the roots being retrenched, they were replanted in the same place. By this mode of treatment they were thrown into bearing at two years old. One or two apples were allowed to remain on each tree: these consequently attained a large size, a more perfect maturity. The seeds from these fruits, Mr. K. then sowed, in the hope of procuring seedlings possessed of good or of promising qualities; and these hopes have not been disappointed. In order to produce a hybrid variety, possessing perhaps a union of the good properties of two kinds, Mr. K. had recourse to the nice operation of dusting the pollen of one variety upon the pistils of another. He opened the unexpanded blossom, and cut away, with a pair of fine pointed scissors, all the stamina, taking great care to leave the styles and stigmata uninjured. The fruit which resulted from this artificial impregnation were the most promising of any, and the seeds of these he did not fail to sow. Every seed, though taken from the same individual fruit, furnishes a distinct variety. These varieties, as might be anticipated, prove of very different merits; but to form a general opinion of their value, it is not necessary to wait till they produce fruit: an estimate may be formed, even during the first summer, by the resemblance the leaves bear to those of the highly cultivated or approved trees, or to those of the wild kinds. The more they approach to the former, the better is the prospect. The leaves of good kinds improve in character, becoming thicker, rounder, and more downy every season. The plants whose buds in the annual wood are full and prominent, are usually more productive than those whose buds are small and shrunk into the bark. But their future character, as remarked by Mr. K. must depend very

much on the power the blossoms possess of bearing cold ; and this power is observed to vary in the different varieties, and can only be ascertained by experience. Those which produce their leaves and blossoms early are preferable, because, although more exposed to injury by frosts, they are less liable to the attacks of caterpillars. It is also to be observed, that even after a seedling tree has begun to produce fruit, the quality of this has a tendency to improve as the tree itself becomes stronger and approaches maturity ; so that if a fruit possess any promising qualities at first, great improvement may be expected in succeeding years.

A precaution is suggested, by the honourable T. Pickering, that apple trees, bearing bad or ordinary fruit, should not be suffered to grow with those which bear fruit of a superiour quality. It is a fact, with which gardeners are familiar, that the blossoms of cucumbers will greatly injure the flavour of melons that grow near them ; and it is reasonable to suppose that fruits, while forming on the trees, are liable in like manner to suffer deterioration. The result of the following experiment would seem to strengthen the above conjecture. The experiment, it is said, has in numerous instances succeeded, without a single failure. In an orchard, containing a great variety of apple trees, bearing sweet, and some very acrid fruit, and others partaking of both these properties, in the vernal season, when the trees are in full blossom, the pollen (or impregnating dust) was taken from one tree, (for example, where the fruit is very sweet,) and deposited on the flowers of a particular branch of another tree, whose fruit is extremely acrid. The apples of that particular branch were found to combine these two properties for that season ; and by this simple process, the experimenter asserts, he can easily provide himself with apples, for that season, perfectly

to his taste, which he considers much more expeditious and equally as certain a process as that of grafting.

AN account of a singular apple tree, producing fruit of opposite qualities; a part of the same apple being frequently sour, and the other sweet: in a letter from the Reverend Peter Whitney, published in the memoirs of the American academy of arts and sciences, vol. 1.

“THERE is now growing, in an orchard lately belonging to my honoured father, the reverend Aaron Whitney, of Petersham, deceased, an apple tree very singular with respect to its fruit. The apples are fair, and when fully ripe, of a yellow colour, but evidently of different tastes—sour and sweet. The part which is sour is not very tart, nor the other very sweet. Two apples, growing side by side on the same limb, will be often of these different tastes; the one all sour, and the other all sweet. And, which is more remarkable, the same apple will frequently be sour one side, end, or part, and the other sweet, and that not in any order or uniformity; nor is there any difference in the appearance of one part from the other. And as to the quantity, some have more of the acid and less of the sweet, and so *vice versa*. Neither are the apples, so different in their tastes, peculiar to any particular branches, but are found promiscuously, on every branch of the tree. The tree stands almost in the midst of a large orchard, in a rich and strong soil, and was transplanted there forty years ago. There is no appearance of the trunk, or any of the branches, having been engrafted or inoculated. It was a number of years after it had borne fruit, before these different tastes were noticed; but, since they were first discovered, which is about twenty years, there has been, constantly, the same variety in the apples. For the truth of what I have asserted, I can appeal to many

persons of distinction, and of nice tastes, who have travelled a great distance to view the tree, and taste the fruit ; but to investigate the cause of an effect, so much out of the common course of nature, must, I think, be attended with difficulty. The only solution that I can conceive is, that the *corcula*, or hearts of two seeds, the one from a sour, the other from a sweet apple, might so incorporate in the ground as to produce but one plant ; or that farina from blossoms of those opposite qualities, might pass into and impregnate the same seed. If you should think the account I have given you of this singular apple tree will be acceptable to the American academy, please to communicate it.

“I am, &c.

PETER WHITNEY.”

ENGRAFTED FRUITS NOT PERMANENT.

Mr. Bucknal, an ingenious English writer, has favoured the publick with some highly valuable and interesting observations on the subject of engrafted fruit trees, of which the following is an abstract, from *Dom. Ency. Mease's edit. vol. v. p. 192.*

Engrafted fruits, Mr. Bucknal asserts, are not permanent. Every one, of the least reflection, must see that there is an essential difference between the power and energy of a seedling plant and the tree which is to be raised from cuttings or elongations. The seedling, is endued with the energies of nature, while the graft, or scion, is nothing more than a regular elongation, carried, perhaps, through the several repetitions of the same variety ; whereas the seed, from having been placed in the earth, germinates, and becomes a new plant, whenever nature permits like to produce like in vegetation. Engrafted fruits are doomed by nature to continue for a time, and then gradually decline, till at last the variety is totally lost,

and soon forgotten, unless recorded by tradition, or in old publications. From the attention lately paid to the culture of engrafted fruits, we are now enabled to continue a supposed happily acquired tree, for a much longer duration, than if such variety had been left in the state of unassisted nature ; perhaps a duration as long again, or something more. But there is no direct permanency, because the kernels, within the fruit, which are the seed of the plants for forming the next generation of trees, will not produce their like. They may do so accidentally ; but nothing more can be depended on. For example, suppose we take ten kernels, or pips, of any apple raised on an engrafted stock : sow them, and they will produce ten different varieties, no two of which will be alike, nor will either of them closely resemble the fruit from which the seeds were collected. The leaves also, of those trees raised from the same primogeneous or parent stock, will not *actually* be a copy of the leaves of any one of the varieties or family, to which each is connected by a vegetable consanguinity. In choosing the seed, that apple is likely to produce the clearest and finest plants, whose kernels are firm, large, and well ripened. The size of the fruit is not to be regarded ; for large apples do not always ripen well, or rather, for cider, the small fruits are generally preferred, for making the strongest and highest-flavoured liquor. Should no valuable apples be raised from this process, the seedlings will make excellent stocks to engraft upon. In attempting to acquire new varieties, all the young plants, from the bed of apple quick, whose appearance is in the least degree, promising, should be selected and planted together, at such a distance, as to allow each to produce its fruit, which will happen in about from twelve to fifteen years, though Mr. Knight had two plants bearing fruit at six, and one at five years. Mr. Bucknal mentions one variety of ap-

ple, within his knowledge, which he supposes to be one hundred and forty years old ; and a pear tree, supposed to be two hundred years old. It is an undoubted fact, and worthy of observation, that all the different trees, of the same variety, have a wonderful tendency to similarity of appearance among themselves ; and that the parent stock, and all engrafted from it, have a greater resemblance to each other, than can be found in any part of the animal creation ; and this habit does not vary to any extent of age. Whatever is said here respecting the apple, is equally applicable to the pear tree. Some years ago, from due investigation and thorough conviction, Mr. B. propagated the principle, that all the grafts, taken from the first tree or parent stock, or any of the descendants, will for some generations thrive ; but when this first stock shall, by mere dint of old age, fall into actual decay, a nihility of vegetation, the descendants, however young, or in whatever situation they may be, will gradually decline ; and, from that time, it would be imprudent, in point of profit, to attempt propagating that variety from any of them. This is the dogma which must be received as undoubtedly true. From the time the kernel germinates for apple quick, should the plant be disposed to form a valuable variety, there will appear a regular progressive change or improvement in the organization of the leaves, until that variety has stood and grown sufficient to blossom and come to full bearing ; that is, from the state of infancy to maturity ; and it is this and other circumstances, by which the inquisitive eye is enabled to form the selection, among those appearing likely to become valuable fruits. But from that time, the new variety, or select plant, being compared with all the engraftments which may be taken from it, or any of them, these shall show a most undeviating sameness among themselves. The different varieties of fruit

are easily distinguished from each other by many particulars ; not only their general fertility, and the form, size, shape and flavour of the fruit, but also the manner of the growth of the tree, the thickness and proportion of the twigs, their shooting from the parent stem, the form, colour, and consistence of the leaf, and many other circumstances by which the variety can be identified ; and were it possible to engraft each variety on the same stock, they would still retain their discriminating qualities with the most undeviating certainty. Further, if twenty different varieties were placed together, so that each could receive its nurture from the same stem, they would gradually die off in actual succession, according to the age or state of health of the respective variety at the time the scions were placed in the stock ; and a discriminating eye, used to the business, would nearly be able to foretell the order in which each scion would actual decline. Should it also happen that two or three suckers, from the wilding stock, had been permitted to grow among the twenty *grafts*, such suckers, or wilding shoots, would continue, and make a tree after all the rest are gone. A further consequence would result from the experiment. Among such a number of varieties, each of the free growers would starve the delicate, and drive them out of existence only so much the sooner. It must be observed, that this supposed stem is the foster parent to the twenty scions, and real parent to the suckers ; and those least conversant with engrafted fruits know the advantage acquired by this circumstance. By an experiment, says Mr. B. we have had in hand for five years, it will appear, that the roots and stem of a large tree, after the first set of scions are exhausted or worn out, may carry another set for many years ; and we suspect a third set, provided engrafting is properly done, and the engrafter chooses a new variety. To express

the concluding sentiments of Mr. B. in a few words, he maintains, that the different varieties of the apple will, after a certain time, decline and actually die away, and each variety, or all of the same stem or family, will lose their existence in vegetation; yet, after the debility of age has actually taken possession of any variety, and the vital principle is nearly exhausted, a superiour care and warmth will still keep the variety in existence some time longer. This, he observes, is an abstruse subject, very little understood, and requiring at first some degree of faith, observation and perseverance. Mr. B. is fully convinced that we have the power of multiplying a single variety, to whatever number we please; and although these trees may amount to millions, yet, on the death of the primogeneous or parent stock, merely from old age or nihility of growth, each individual shall decline, in whatever country they may be, or however endued with youth and health. Nothing sublunary, which possesses either animal or vegetable life, is exempt from age and death. To exemplify this point more intelligibly, let it be supposed that the *Baldwin apple* is a new variety produced from the seed. This, as the original stock, may continue to live one hundred years. A scion, taken from it when ten years old, may live ninety years; another, taken ten years after, may enjoy a duration of eighty years; and so progressively. At the expiration of one hundred or more years, the original stock, and all derivatives from it, will become extinct.

METHOD OF FORCING FRUIT TREES TO BLOSSOM AND
BEAR FRUIT.

With a sharp knife, cut a ring round the limb or small branch which you wish should bear, near the stem or large bough where it is joined; let this ring

or cut penetrate to the wood. A quarter of an inch from this cut, make a second like the first, encircling the branch like a ring a quarter of an inch broad between the two cuts. The bark, between these two cuts, must be removed, clean down to the wood; even the fine inner bark, which lies immediately upon the wood, must be scraped away, until the bare naked wood appears, white and smooth, so that no connexion whatever remains between the two parts of the bark. This barking, or girdling, must be made at the precise time when, in all nature, the buds are strongly swelling, or about breaking out into blossoms. In the same year a callus is formed at the edge of the ring, on both sides, and the connexion of the bark is again restored, without any detriment to the tree or the branch operated upon. By this simple operation, the following advantages will be obtained: 1. Every young tree, of which you do not know the sort, is compelled to show its fruit, and decide sooner whether it may remain in its present state, or requires to be grafted. 2. You may thereby, with certainty, get fruit of a good sort, and reject the more ordinary. The branches so operated upon, are hung full of fruit, while others, that are not ringed, often have none or very little on them. This effect is explained from the theory of the motion of the sap. As this ascends in the wood and descends in the bark, the above operation will not prevent the sap rising into the upper part of the branch, but it will prevent its descending below this cut, by which means it will be retained in and distributed through the upper part of the branch in a greater portion than it could otherwise be, and the branch and fruit will both increase in size much more than those that are not thus treated. The twisting of a wire or tying a strong thread round a branch has been often recommended as a means of making it bear fruit. In this case, as in ringing the bark, the

descent of the sap in the bark must be impeded above the ligature, and more nutritive matter is consequently retained, and applied to the expanding parts. The wire or ligature may remain in the bark. Mr. Knight's theory, on the motion of sap in trees, is "that the sap is absorbed from the soil by the bark of the roots, and carried upward by the alburnum of the root, trunk and branches; that it passes through the central vessels into the succulent matter of the annual shoots, the leaf-stalk and leaf; and that it is returned to the bark through certain vessels of the leaf-stalk, and descending through the bark, contributes to the process of forming the wood. A writer in the American Farmer says, he tried the experiment of ringing some apple, peach, pear, and quince trees on small limbs, say from an inch to an inch and a quarter in diameter. The result was, the apples, peaches and pears were double the size on those branches than on any other part of the trees: in the quinces there was no difference. One peach, the heath, measured, on a ringed limb, in circumference, $11\frac{1}{4}$ inches round, and $11\frac{3}{4}$ inches round the ends, and weighed 15 ounces. The limbs above the ring have grown much larger than below it. If the ring be made so wide that the bark cannot unite the same season, the branch will perish.

NURSERY.

It has been a received opinion, that the soil for a nursery should not be made rich, as the plants, when removed to a more fertile soil, will flourish more luxuriantly; but later observation has decided that the reverse of this will be found correct. There is a close analogy between vegetable and animal life; and it is a dictate of nature that both require a full supply of nutriment from their earliest existence. It would

be absurd to suppose that the tender roots of young seedlings are capable of drawing sufficient nutriment from a rank, barren, and uncultivated soil, and those that are barely supported, or nearly starved at first, will never afterwards become vigorous, stately and handsome, though surrounded by the richest mould. Repeated experiments have proved that a strong and vigorous plant, that has grown up quickly, and arrived at a considerable magnitude in a short time, never fails to grow better after transplanting, than another of the same size that is older and stunted in its growth. Where the soil is poor and lean, trees in every stage of growth, are observed to be languid, weak, and stunted; while those reared in a good mellow soil always assume a free growth, and advance with strength and vigour. It is evident, therefore, that the ground to be occupied for a fruit nursery, requires to be made rich and fertile. The soil should also be deep, well pulverized, and cleared of all roots and weeds. The seeds may be sown either in autumn or April, and in one year after, the young plants may be taken up and replanted in the nursery. It is important that the situation be such as to admit of a free circulation of air, and open to the sun, that the plants may be preserved in a healthy condition. Plants reared in a confined and shaded situation in a large town, and removed to an open exposure in the country, will long continue in a debilitated condition; like a puny city invalid, their growth will be greatly impeded, and many years will elapse before they attain to a state of vigour, health, and hardihood.

From the observations in the preceding pages, it is obviously important, that the seed, to be planted in nurseries, should be selected from fruit of a superiour quality. John Kenrick, esquire, of Newton, Massachusetts, has, however, adopted the following method. Take the pumice from late-made cider, separate the

seeds by means of a riddle sieve, mix them with a quantity of rich loam sifted fine; put this into a box and expose it to the weather during winter. In April, the earth and seeds are put into a basket, and washed until the seeds are separated, when they are planted in a naturally rich soil, thoroughly pulverized, and well prepared with rotten manure and leached ashes. The seeds are planted in straight, parallel rows, three feet apart, and about two inches deep; the plants, if too thick, may be thinned to about six inches apart, by pulling up the feeblest. The plants should be kept clear of weeds, annually manured, and properly pruned. Young trees should be effectually secured from sheep and horned cattle, in every stage of their growth.

In Marshall's Rural Economy it is directed, that the seedling plants, when taken from the seed bed, be sorted agreeably to the strength of their roots, that they may rise evenly together. The tap, or large bottom root, should be taken off, and the longer side rootlets should be shortened. The young plants should then be set in rows, three feet apart, and from fifteen to eighteen inches asunder, in the rows; care being taken not to cramp the roots, but to bed them evenly and horizontally among the mould. In strictness of management, they ought, two years previous to their being transferred to the orchard, to be transplanted into unmanured double dug ground, four feet every way apart, in order that the feeding fibres may be brought so near the stem, that they may be removed with it into the orchard, instead of being, as they generally are, left behind in the nursery. Hence, in this second transplanting, as in the first, the branches of the root should not be left too long, but ought to be shortened in such a manner as to induce them to form a regular globular roof, sufficiently small to be removed with all their plants, yet sufficiently large to

give it firmness and vigour in the plantation. It is reported, that the *agricultural society of Nova Scotia* has found, by experience, that apple trees, raised from seeds, if transplanted from the seed bed, in time, (having the tap root cut off,) may be rendered fit for grafting one or two seasons earlier than if left in the place where the seeds were sown. While in the nursery bed, the young plants require to be frequently hoed; the earth should be kept loose, and entirely free from weeds; and, in a very dry season, they should be occasionally watered. When two years old, they will be in a proper condition to receive the scions, or buds, which are intended for them, as the operation is then more easy and certain than when the stocks are older.

ENGRAFTING.

The art of engrafting has not, it is believed, been traced to its origin. In a treatise published by Parkinson, in 1629, both grafting and inoculating are mentioned, but the period when the practice commenced has not been ascertained. The great utility and advantage of the art is, however, universally understood. According to Mr. Yates, (letter published in Forsyth's treatise,) the art was introduced into America by Mr. Prince, a native of New-York, who established a nursery in its neighbourhood about sixty years ago. Fruit trees, which are grafted or inoculated, come into a bearing state several years sooner than those produced from seed; besides, grafted or inoculated trees invariably produce the same kind of fruit as the parent tree from which the scion or bud is taken, while that from seedling trees is liable to sport in endless varieties. In the choice of scions for grafting, the first essential requisite is, that they are of the same genus and natural family with the stock which is to become their foster parent, and which is to afford

them future nourishment and support. The apple cannot be advantageously engrafted on a pear stock, nor will a pear succeed well on an apple stock; for, although it may flourish and bear fruit for a few years, it will never prove a profitable tree, and will decline and decay sooner than others. Scions from a winter apple tree should not be grafted on a summer apple stock, because the sap in the summer stock is liable to decline and diminish before the winter fruit has become fully ripe. In the memoirs of the American academy of arts and sciences, volume 1, page 388, is a communication from the late honourable B. Lincoln, relative to the engrafting of fruit trees, &c. in which he says, "I had observed, for a number of years, an apple tree in my orchard, the natural fruit of which was early, having been grafted with a winter scion, producing fruit very like in appearance to the fruit produced by the tree whence the scion was taken but destitute of those qualities inherent in that fruit, and necessary to its keeping through the winter. This led me to call in question the propriety of grafting winter fruit on a summer stock," &c. A pear is occasionally engrafted on a quince, for the purpose of dwarf trees, but it is of smaller growth, and less vigorous and durable than if nourished by its more natural parent. It is next important, that scions be taken from trees that have attained to the maturity of full bearing. Perhaps cultivators, in general, are not apprized of the fact, that, if a scion be taken from a seedling tree of one or two years old, it will retain the character and undergo the same annual change as the seedling tree itself, whatever be the age of the stock into which it is inserted; and that it will remain unproductive of fruit, until the seedling tree has acquired its proper age and maturity. It is strongly to be suspected, that nursery men, either from ignorance or indifference, have disregarded this circumstance, and

imposed upon purchasers trees of this description, by which their just expectations have been disappointed. Scions if they are to be transported to a distance may be cut at any time from January to March, before the buds begin to swell ; and in order to preserve them in good condition for grafting, their cut ends should be covered with grafting clay or wax, or the whole scion may be enveloped in swamp moss. But experience is decidedly in favour of taking the scions immediately from the tree at the time they are to be employed, if convenient. Scions should always be taken from the extremities of the most thrifty and best bearing trees, and of the last year's growth, except only just enough of the growth of the year before to fix in the earth, to preserve them moist until they are to be used. In the Edinburgh encyclopedia it is advised to cut the scions several weeks before the season for grafting arrives ; the reason is, that experience has shown, that grafting may most successfully be performed, by allowing the stock to have some advantage over the graft in forwardness of vegetation. It is desirable, that the sap of the stock should be in brisk motion at the time of grafting ; but by this time, the buds of the scion, if left on the tree, would be equally advanced ; whereas the scions, being gathered early, the buds are kept back, and ready only to swell out, when the graft is placed on the stock. The selecting proper scions, the writer observes, is a matter of the greatest importance, if we wish to enjoy the full advantage which may be derived from grafting. They should be taken from a healthy tree in full bearing, and from the outer side of the horizontal branches of such a tree, where the wood has freely enjoyed the benefits of sun and air. It should be remarked that a scion taken from a full bearing tree and inserted into a tree having attained to the maturity of bearing, will mature fruit sooner than if the same scion is inserted into

a seedling stock. It may be best to take but one scion from the same twig, cutting off its extremity when to be inserted, as the middle part affords the best graft; leaving only two or three eyes or buds. If the scion be too long, it requires more time for the ascending sap to reach its extreme end, and it will be more liable to fail. The most proper season for grafting in our climate, is from about the 20th of March to the 1st of June, though the operation has succeeded well as late as July, when scions may be taken directly from the tree; and when the first grafting has failed, the operation may be repeated the same season by cutting the stock a little lower. Practical gardeners, it is said, concur, in stating, that the nature of fruit is, to a certain extent, affected by the nature of the stock. Crab stocks, for example, cause apples to be firmer, to keep longer, and to have a sharper flavour. Mr. S. Cooper, of New-Jersey, expresses himself as follows, on this subject: (Dom. Ency. Mease's edit.) "I have, in numerous instances, seen the stock have great influence on the fruit grafted thereon, in respect to bearing, size, and flavour, and also on the durability of the tree, particularly in the instance of a number of Vandevere apple trees; the fruit of which was so subject to the bitter rot as to be of little use. They were engrafted fifty years ago, and ever since those of them having tops composed of several different kinds, though they continue to be more productive of fruit than any others in my orchard, yet are subject to the bitter rot, the original and well known affection of the fruit of the primitive stock. I have had frequent opportunities of observing the same circumstance, in consequence of receiving many scions from my friends, which, after bearing, I engrafted, and the succeeding fruit uniformly partook, in some degree, of the qualities of the former, even in their disposition to bear annually or biennially." Mr. C. has ascertained the

fact that early and late apples, by being grafted on the same tree, improved in size and flavour more than if but one kind grew on a tree. It should be observed, as a rule, never to employ suckers from old trees as stocks for grafts, or buds, as they have a constant tendency to generate suckers, and thereby injure the growth of the trees.

MODES OF GRAFTING.

The mode of performing this operation is varied, according to the size and situation of the stock to be employed. The small stocks in the nursery, if of such kind as produce an erect strong stem, are usually grafted within or near the surface of the earth, in which case, the mould is brought round them in the form of a little hillock, and nothing more is required. When the stock is naturally inclined to branch out horizontally, the preferable mode is to insert the bud or graft high enough to form a handsome head or top. In this mode of operating, it is necessary to employ some kind of composition or covering in order to secure from injury by the weather, or influence of the sun. The following is commonly used: A quantity of clay or stiff loam is to be worked fine and mixed with coarse horse-dung. It should be prepared a day or two before hand, and be beat up with a little water as needed. This should be applied closely round the parts in the form of a collar, or ball, tapering at both ends, the upper end being applied closely to the graft, and the under to the stock. The following compositions are preferred by some operators:—Three pints of tar, one pound beeswax, melted together, and while cooling stir in one pound of red or yellow ochre. Or *another*—Four parts rosin, two parts beeswax, and one part tallow, melted together. This may be warmed and spread on narrow strips of rag or paper, and

carefully wound round the stock and scion. A common sod applied with the grass side out is often employed and seldom fails of answering every purpose. In grafting trees of considerable size, care should be taken not to cut off the whole head and branches at once, but leave some of the lateral branches to draw up the sap till another season, and cut them gradually, as occasion may require ; otherwise, in a hot and dry summer, the trees are apt to suffer and die. Care should also be taken to avoid loosening or injuring the bark of the stock, by dividing the bark with a sharp knife before splitting the stock. In shaping the scion for insertion, the slope should be cut full one inch or more in length; and by some we are advised to cut the scion in such manner as to take the bulge formed between the present and the last year's growth, to shape and set in the stock, as in that joint or bulge, the wood is open and porous to receive more readily the sap from the stock. There are several different methods of performing the operation of grafting, in all which, it should be a general rule to adjust the inner bark of the stock and of the scion in close contact, and to confine them precisely in that situation. If this be accurately effected, all species of grafting will prove successful. In that method which is usually called *whip-grafting*, or *tongue-grafting*, the top of the stock and the extremity of the graft should be nearly of equal diameter. They are both to be sloped off a full inch or more, and then tied closely together. This method may be much improved, by performing what gardeners call *tongueing* or *lipping* ; that is, by making an incision in the bare part of the stock, downwards, and a corresponding slit in the scion, upwards ; after which they are to be carefully joined together, so that the barks of both may meet in every part, when a bandage of bass wood is to be tied round the scion, to prevent it from being displaced ; and

the whole is to be covered over with the composition. When the stocks to be grafted upon are from one to two or more inches in diameter, as branches of trees, *cleft-grafting* is generally employed. The head of the stock or branch being carefully cut off in a sloping direction, a perpendicular cleft or slit is to be made, about to two inches deep, with a knife or chisel, towards the back of the slope, into which a wedge is to be driven, in order to keep it open for the admission of the scion. The latter must now be cut in a perpendicular direction, and in the form of a wedge, so as to fit the incision in the stock. As soon as it is prepared, it should be placed in the cleft in such manner that the inner bark of both the stock and scion may meet exactly together. It is then to be tied with a ligature of bass, and clayed over, as is practised in whip-grafting, three or four eyes being left in the scion uncovered. It should be observed, that in making the cleft in the stock, care should be taken not to injure the pith, the scions being inserted in the sap wood of the stock or branch. Old stocks may be grafted in the bark, called *crown-grafting*, but this cannot be practised successfully till the sap be in full motion, that the bark may be easily raised from the wood. The head of the stock or thick branch is cut off horizontally; a perpendicular slit is made in the bark, as in budding; a narrow ivory folder is thrust down between the wood and the bark, in the places where the grafts are to be inserted. The graft is cut, at the distance of an inch and a half from its extremity, circularly through the bark, not deeper than the bark on one side, but fully half way through or beyond the pith on the other. The grafts being pointed, and a shoulder left to rest on the bark of the stock, they are inserted into the openings, and either three or four grafts are employed, according to the size of the crown. *Side-grafting* is sometimes employed for sup-

plying vacancies on the lower parts of full grown fruit trees. The bark and a little of the wood are sloped off for the space of an inch and a half, or two inches; a slit is then made downwards, and a graft is cut to fit the part, with a tongue for the slit; the parts, being properly joined, are tied close and clayed over. When stocks cannot readily be procured, *root-grafting* may be successfully employed. A piece of the root of a tree of the same genus, well furnished with fibres, is selected, and a graft placed on it, tied and clayed in the ordinary way. Thus united, they are set with care in a trench in the ground, the joining being covered, but the top of the graft being left two inches above ground.

"The following new mode of grafting," says Dr. Mease, (Dom. Ency.) "the late Mr. A. C. Du Plaine informed the editor, was long kept a secret in France. A limb of willow, three or four inches thick, was buried in a trench deep enough to receive it, and at the distance of every four or five inches, holes were bored, into which grafts were inserted, care being taken to make the bark of the graft, and the limb into which it was inserted touch; the lower part of the graft was pointed and the bark shaved off. The limb and the grafts were then covered with earth and kept moist, and about two inches of the latter left above the surface. In process of time the limb rotted, and the grafts took root. The different grafts were then dug up and transplanted." In the same valuable publication, Dr. Mease has communicated an account of the mode of Mr. William Fairman, of "*extreme-branch grafting*," upon old decayed trees, "which promises to be of a very great acquisition to those who take pleasure in cultivating fruit." The process is as follows: "Cut away all spray wood, and make the tree a perfect skeleton, leaving all the healthy limbs; then clean the branches, and cut the top of each off, where it would

measure in circumference from the size of a shilling to about that of a crown piece. Some of the branches must of course be taken off where they are a little larger, and some smaller, to preserve the canopy or head of the tree; and it will be necessary to take out the branches which cross others, and observe the arms are left to fork off, so that no considerable opening is to be perceived when you stand under the tree, but that they may represent a uniform head. When preparing the tree, leave the branches sufficiently long to allow of two or three inches to be taken off by the saw, that all the splintered parts may be removed. The tree being thus prepared, put in one or two grafts at the extremity of each branch, and put on the cement or composition, and tie with bass or soft strings. Sever the shoots or suckers from the tree until the succeeding spring. 'To make good the deficiency in case some grafts do not succeed, additional grafts may be inserted in the sides of the branches, or where they are wanted to form the tree into a handsome shape.' It too frequently happens that a considerable proportion of the scions inserted fail of taking effect, and we are disappointed in our expectations. There must be a cause for this failure. Too much heat and dryness in the atmosphere, or too much cold and moisture, may interrupt this vegetable process. If the scions are suffered to become dry and withered, their vital principle will be lost; if saturated with moisture, they cannot so readily imbibe the nutritious juice by which their union with the stock is cemented. Much depends on a proper coaptation of the barks of the stock and the scion, and the nature of the composition applied, is not without its influence. When tar and turpentine are employed, their volatile oil, unless qualified by some admixture, is supposed to penetrate into the vessels of the scion, obstruct the circulation of the sap, and cause mortification. Among our re-

cent improvements, it has been ascertained that grafting and budding may be successfully performed as late as August and the first part of September, provided the weather should continue warm, taking the scions directly from the tree; and the operation may be repeated in case of failure, on the same stock, several times in the season. If therefore, the scion should not manifest signs of active vegetation in ten or twelve days after being inserted, the stock may be again sawed down and a new scion introduced. Our chance of success may also be increased by a double process, that is, by introducing one or more buds into the same stock with the engrafted scion; and these operations being occasionally repeated, we shall seldom fail of complete success. A bud taken from a scion or twig of the last year, if inserted in April, will immediately sprout and have the same advantage as the engrafted scion.

BUDDING, OR INOCULATING.

By the process of budding, we obtain the same result as in grafting; with this difference, however, the bud being a shoot in embryo, grafted trees usually produce fruit two seasons earlier than budded trees. Each bud may be considered a distinct being, which will form a plant retaining precisely the peculiarities of the parent stock; and five or six species of fruit may be budded on one tree, which, when attained to the maturity of bearing fruit, exhibit a singular and beautiful spectacle. Buds are formed at the bases of the foot stalks of the leaves, and are of two kinds, those which bear leaves, and those which bear flowers. The leaf buds are small, long, and pointed; the flower buds are thick, short, and round. Both leaves and flowers are sometimes produced by the same bud, and they are generally employed, in budding, without dis-

unction; but the bud should always be of the same genus with the tree or branch which is to receive it. The blossom buds are formed by the first sap between April and June, and are filled by the second sap between July and October. The proper season for budding, is from the beginning of July to the end of September, at which period the buds for next year are completely formed in the axilla of the leaf of the present year, and they are known to be ready, from their easily parting from the wood. The buds preferred, are the shortest observed on the middle of a young shoot, on the outside of a healthy and fruitful tree; on no account should an immature tree or a bad bearer, be resorted to for buds. For gathering the shoots containing the buds, a cloudy day, or an early or late hour, is chosen, it being thought that shoots, gathered in full sunshine, perspire so much as to drain the moisture from the buds. The buds should be used as soon after being gathered as possible, and the whole operation should be quickly performed. In taking off the bud from the twig, the knife is inserted about half an inch above it, and a thin slice of the bark, and wood along with it, taken off, bringing out the knife about an inch and a half below the bud. This lower part is afterwards shortened and dressed, and the leaf is cut off, the stalk being left about half an inch long. Perhaps it is better to insert the knife three quarters of an inch *below* the bud, and to cut upwards; at least, this mode is practiced in the Scottish nurseries. The portion of wood is then taken out by raising it from the bark, and pulling it downwards or upwards, according as the cut has been made from above or below. If the extraction of the wood occasion a hole at the bud, that bud is spoilt, and another must be prepared in its stead; as gardeners speak, the root of the bud has gone with the wood, instead of remaining with the bark. For the performance of the ope-

ration, provide a sharp budding-knife, with a flat thin haft, of ivory, suitable to open the bark of the stock for the admission of the bud, and also with a quantity of bass strings, or shreds of Russian mats, or woollen yarn, to bind round it when inserted. On a smooth part of the bark of the stock a transverse section is made through the bark down to the wood; from this is made a longitudinal cut downward, about an inch and a half long, so that the incision may somewhat resemble a Roman T; by means of the flat ivory haft of the budding-knife the bark is raised a little on each side of the longitudinal incision, so as to receive the bud. The prepared bud is placed in the upper part of the incision so made, and drawn downwards; the upper part is then cut off transversely, and the bud pushed upwards till the bark of the bud and of the stock join together. It is retained in this situation by means of tying with strands of bass, matting, or woollen yarn, applied in such manner as to defend the whole from the air and sun, but leaving the leaf stalk, and the projecting part of the bud, uncovered. In about ten or twelve days after the operation, the tying is slackened; buds, that have taken, appear swelled, and the foot stalk of the old leaf falls off on being slightly touched. The head of the stock is not removed till the following March; after this, the bud grows vigorously, and, in the course of the summer, makes a considerable shoot. Against the next spring the shoot is headed down in the manner of young grafted trees.

Mr. Knight, the celebrated English horticulturalist, has adopted the following improved mode of budding, to accelerate the vegetating process in the young bud. In the month of June, when the buds are in a proper state, the operation is performed by employing two distinct ligatures to hold the buds in their places; one ligature is first placed above the bud inserted,

and upon the transverse section through the bark ; the other, the only office of which is to secure the bud, is applied in the usual way ; as soon as the buds have attached themselves, the lower ligatures are taken off, but the others are suffered to remain. The passage of the sap upwards, is, in consequence, much obstructed, and the inserted buds begin to vegetate strongly in July ; when these afford shoots about four inches long, the upper ligatures are taken off to permit the excess of sap to pass on ; the wood ripens well, and affords blossoms, sometimes, for the succeeding spring. It will be perceived, that instead of the usual mode of budding, after the commencement of the autumnal flow of sap, and keeping the bud without shooting until the following spring, when the top of the stock is cut off ; this improved mode gains a season in point of maturity, if not of growth, and has the effect of grafting the preceding spring, in all cases where the bud sprouts in proper time to form a strong shoot, capable of sustaining, without injury, the frost of the ensuing winter. A different method of making the incision into the stock is preferred by some. Instead of making a perpendicular cut downwards from the transverse incision, it may be reversed, rising upwards so that the incision to receive the bud, resemble the capital reversed, thus, \perp ; and the bud pushed upward to the position desired. By this method the bud being placed above the transverse cut, receives a greater abundance of the sap descending in the bark, than if placed below it. The fact is now decided by ample experience, that apple and pear trees, and probably stone fruit also, may be successfully grafted or budded at any time after the sap rises, about the tenth of April to the middle of September ; and that the operation, in case of failure, may be several times repeated on the same stock during the season. For early budding, take the buds from cuttings, or scions from

bearing trees, in February or March, and preserve them in boxes of sand in a cellar, in the same manner as if intended for grafting. These may be preserved in a good condition for use, until June or July, and may be employed either for grafting or budding as may be preferred. The process of budding I hold in preference to that of grafting; it is neater and may be performed with more facility, and more certainty of taking effect, and when the buds are taken from a scion of the last year's growth, it will, if the season prove favourable, shoot two or three feet in length before winter, and will produce fruit as soon as if grafted. Not only young stocks, but the branches of large trees may be budded successfully. In order to render the operation the more certain, we may avail ourselves of a double advantage by inserting in the month of April both scions and buds into the same stock; and if found necessary, the operation may be repeated every ten or twelve days, until the new buds formed in July and August are sufficiently matured to be employed. These buds should be taken from the best grown shoots of the present year, selecting those that are well formed, large and plump; but these will be one year longer in producing fruit. In about eight or ten days the wrapping strings should be loosened, and if the buds have not effected a union in that time, they will in general entirely fail; and if the buds, instead of being fresh and plump, then appear of a dark colour, shrunk, and withered, the stocks should be immediately rebudded. Instead of Mr. Knight's method, by a strong ligature above the inserted bud, to force a supply of sap, another advocate for early budding has adopted a mode which will be preferred by some as being more natural and simple. (New Eng. Farmer, vol. 1, p. 146.) So soon as it can be ascertained that the bud will live, which he says may be in about a week, if the stock be small let it be instantly headed down just

above the bud to be nourished. If the stock be large, amputate the principal branches; and the consequence will be an immediate bursting of all the latent buds, together with the inoculated one. As the inoculated branches multiply, diminish the original one till nothing remains but the new tree. From this simple treatment, the buds will extend, if inserted early, many feet with numerous branches the same summer, and be prepared to produce fruit the ensuing year, and in some instances blossoms appear the same season. These buds so early introduced, will acquire strength sufficient to resist the frost and cold of the ensuing winter, equally well with the engrafted scion. It is strongly recommended by Mr. Forsyth, as soon as the incision is made and the bud or graft inserted, to rub on with the finger or brush, some of his composition before the wrapping strings are tied on, then cover the strings all over with the composition as thick as it can be laid on with a brush, and this he thinks, is preferable to the clay composition. It is important to observe as a rule, not to slacken too soon the wrapping strings, and if the bark of the stock is found to spread open, the strings should be reapplied and suffered to remain some weeks longer, that the young bud may be secured from the sun and air, until it obtains a firm support in the stock.

NURSERY PRUNING.

Young trees properly pruned in the nursery, will, it is said, come to bearing sooner, and continue in vigour for nearly double the common time. All superfluous or rambling branches should be taken off annually, and only three or four leading shoots be left to every head. Thus managed, the trees will not require to be lopped for a considerable time; and as they will have no wounds open in the year when trans-

planted, their growth will be greatly promoted: The more the range of branches shoots circularly, inclining upwards, the more equally will the sap be distributed, and the better the tree bear. Mr. Cooper, a very intelligent cultivator, remarks that the side shoots should not be cut close to the stem, as the whole growth is thereby forced to the top, which becomes so weighty as to bend and spoil the tree. A better method is, to cut the ends of the side shoots so as to keep the tree in a spiral form, which will encourage the growth of the trunk, until it acquires strength to support a good top. The side shoots may then be cut close. In forming the top, Mr. C. has found it necessary to lighten the east and northeast sides, as fruit trees generally incline that way; and to encourage the branches on the opposite quarters, to keep the sun from the trunk; otherwise the rays of that luminary, when striking at nearly right angles, will kill the bark, bring on canker, and ruin the tree. In Marshal's Rural Economy, we have the following directions. In pruning the plants, the *leading shoot* should be particularly attended to. If it shoot double, the weaker of the contending branches should be taken off. If the leader be lost and not easily recoverable, the plant should be cut down to within a hand's breadth of the soil, and a fresh stem trained. Next to the leader, the stem boughs require attention. The undermost boughs should be taken off by degrees; going over the plants every winter; always cautiously preserving sufficient heads to draw up the sap, thereby giving strength to the stems, and vigour to the roots and branches; not trimming them up to naked stems, as is the common practice, thereby drawing them up prematurely tall and feeble in the lower part of the stems. The thickness of the stem ought to be in proportion to its height; a tall stock therefore requires to remain longer in the nursery than a

low one. We have the respectable authority of Mr. T. Pickering, that such trees as are tall should be cut down close to the ground, to prevent their being shaken by the wind, and to promote their growth. It may seem strange, he observes, to advise the cutting down a tall, well-grown plant, yet it is necessary; for the roots are always hurt and shortened by the removal; it is impossible for those that remain, to nourish the same body; this is the reason we so often find our trees dead at top and hide-bound. Should my directions, he says, be followed, which are from thirty years experience, such vigorous shoots will spring up, as will in ten years become much larger trees than if they had stood uncut for forty years; and the bark and every appearance of the tree will be like one from the seed, and much trouble will be saved in staking, to prevent their ruin from the wind. This method has not, we believe, been very frequently adopted, although recommended by other cultivators beside the venerable author just cited, the result of whose long experience, and the reasons assigned for the practice, must be deemed satisfactory. It has been stated by an English author, that when young trees are planted out from the nursery, as soon as they begin to break in the spring, they are to be cut down to three or four eyes, according to their strength, to furnish them with bearing wood. If this were not done, they would run up in long naked branches, and would not produce one quarter of the fruit which they would when this is properly performed. It is a point of considerable importance to observe, that in cutting off a branch, it should always be done just above a bud close to its shoulder, leaving a smooth and sloping surface that the wound may heal the first season. When a small piece is left above the shoulder of the shoot or bud, the sap ceases to nourish it, and of course the piece dies and communicates a fatal disease to the sound wood.

ORCHARD. PLANTING AND CULTURE.

It is an object of no inconsiderable importance to select the most eligible soil, situation and aspect for laying out a fruit orchard. With respect to soil, it should be of a rich loamy nature, neither too wet or heavy, nor too light or dry. Those fertile fields or pastures which produce abundant crops of corn, grass, and other vegetables, will in general be found well adapted to the growth of fruit trees. But in all cases, the soil should be suited to the particular kind of fruit. In Herefordshire, a celebrated cider county, in England, it is said to be a fact well ascertained, that scions from the same tree, grafted upon similar stocks, and planted in different soils, will produce cider of different qualities. It is also found that the early fruits obtain the greatest perfection in a sandy soil, and that the late fruits succeed best when planted in a strong clay. The best cider orchards are on a strong clayey soil; for it seems to be admitted that the cider from trees in clay is stronger, and will keep better, than cider made from trees on a sandy soil. But again, as applicable to our own country. "The choice of a proper soil and exposure," says Dr. Mease, (Dom. Ency.) "is not sufficiently attended to in the United States. Mr. Riley, of Marcus Hook, whose experience in cider is inferior to none, assures the editor, that apples growing in a good loose soil, produce much more rich and generous liquor than those that grow in a stiff clayey land." An orchard, says an English writer, should rather be elevated than low, as on a gentle declivity open to the south and southeast, to give free admission to the air and rays of the sun, as well as to dry up the damp, and dissipate fogs, in order to render the trees healthy, and give a fine flavour to the fruit. It should likewise be well sheltered from the east, north, and westerly winds. The blos-

soms of apple trees are liable to be injured by spring frosts, when the trees are planted in the lowest parts of a confined valley. In the domestick encyclopedia, Dr. Mease has inserted an excellent paper on the climate of the United States by colonel Tatham, from which I extract as follows. "It is a fact that in those western parts of the United States, which have a high exposure to the winter's blast, the northern sides of a ridge or mountain arrive sooner and more certainly at a state of perfect vegetation, than the south sides, which are laid open to the power of the sun. I account for this phenomenon as follows : I suppose that the southern exposure to the vehement rays of the sun, during the infant stages of vegetation, puts the sap in motion at too early a period of the spring, before the season has become sufficiently steady to afford nurture and protection to the vegetating plant, blossom or leaf ; and when in this state, the first efforts of vegetation are checked by the chilling influence of cold nights, and such changeable weather as the contest between winter and spring is ever ready to produce, in their apparent struggles to govern the season. On the contrary, the northern exposures, which are not so early presented to the vivifying influence of the sun, remain, as it were, in a torpid state until the more advanced period of the spring, when all danger of vegetation being checked, is over." I have long entertained the opinion, says Mr. Yates, that an orchard, exposed to the north, where the ground in the spring of the year continues longer bound by frost, which retards the vegetation, would be preferable to one bearing an easterly or southern aspect, where the sap-juice is sooner in motion, and accelerated by the rays of the sun. The rows of trees in an orchard ought to incline to a point of compass towards the east ; because the sun will shine upon them early in the forenoon, and thus dissipate the

vapours which arise during the vernal nights, and stint the fruit in the earlier stages of its growth. The trees should be arranged in uniform straight rows, as being most convenient to the husbandman, and at the same time exhibiting the most pleasing view to the tasteful eye. The distance in the rows or squares, will depend on the size and form of the full grown tree, and on various other circumstances connected with the future intentions and views of the proprietor. In every instance, however, the distance should be such as to prevent the extreme branches from locking into each other when attained to full maturity of growth. Miller, an experienced English horticulturalist, says, when the soil is good, the distance should be fifty or sixty feet, and where the soil is not so good, forty feet may be sufficient. Lawson, who wrote in 1626, observes, that in a good soil and under proper management, apple trees will, in forty or fifty years, spread twelve yards on each side; and the adjoining tree spreading as much, gives twenty-four yards, or seventy-two feet, and the roots will extend still further. He therefore recommends that apple trees be set at the distance of eighty feet from each other. The advantages of thin planting are said to be: 1. The sun refreshes every tree, the roots, body, and branches, with the blossoms and fruit, whereby the trees are more productive, and the fruit larger, fairer and better flavoured. 2. The trees grow larger, and are more healthy and durable. 3. When trees are planted too near, the lower branches are smothered for want of sun and air, the fruit is never well flavoured, and always small. The object is fruit, and we are not to expect that the quantity will be in proportion to the number of trees in an orchard, for a few trees of a large size will produce more and better fruit, than six or eight times the number of those which grow near and crowd one another. Again, apples are not to be

estimated according to their number only, but their size and weight, as well as their superiour flavour. Another advantage is the profit of cultivating the ground under and about the trees. The intervening spaces may be cultivated with various vegetables, or if preferred, they may be filled with some temporary trees of small growth, as dwarfs, which may be removed when the principal standards have attained to a large size. Many apple trees have borne fruit for more than a century; and when trees show signs of decay at the age of thirty or forty years, it is in general to be attributed to mismanagement, and probably to close planting. Every cultivator must have experienced the great inconvenience occasioned by narrow and crowded intervals. When apple trees stand at the distance of twenty-five or thirty feet only, their horizontal branches will, as we frequently see, in fifteen or twenty years interlope each other, and almost entirely obstruct the intervals between them. Taking into view, therefore, the foregoing particulars, the cultivator, in planting a young orchard, will determine for himself the most convenient and suitable width of the intervals between his trees. The most generally approved distance is forty feet in all directions, and this gives twenty seven trees to an acre, while at thirty feet apart, an acre will contain forty-eight trees, and at thirty-five feet distance, thirty-five trees occupy an acre.

With respect to the most proper season for planting apple trees in the United States, different opinions prevail. According to Dr. Mease, no general rule can be given, owing to the immense variety of climates with which we are favoured. In some states, the autumn may be best, while in others (in Pennsylvania) it is probable that early in the spring answers best. Indeed, in a comparative experiment of spring and autumn planting, made near Philadelphia, in

1802—3, the advantage was *considerably in favour of* those put down in the spring. Some, planted in autumn, were from a nursery near the city, and nearly all died; another parcel, from the excellent nursery of Mr. Prince, of Flushing, Long-Island, arrived late in April, and all survived. There was no reason to suspect any difference in the soil, or the care with which both parcels were planted. E. Preble, esquire, of Boston, is decided in preferring autumn to spring, for planting apple trees, as the ground will settle round the roots before frost, and the trees prepared to shoot in the spring, aided by the rains which prevail at that season. If planted in spring, he observes, the drought and heat of summer will injure, if not destroy them, before the roots find their place. He is in the practice of transplanting them as soon as the foliage is off in autumn, and farmers have more leisure at that season of the year.

PREPARATION OF THE LAND, AND PLANTING.

When the ground is in pasture, it should be ploughed to a considerable depth, and well summer fallowed, till the grass be killed. But, if trenching should be preferred, the spade must be carried to the full depth of the soil; and if it be gravelly, a considerable portion of this should be removed, and its place supplied by a due quantity of rich mould. The quality of the soil should approach as nearly as possible to that of the nursery, in which the trees were reared. If it be poorer, the trees will certainly be impeded in their growth. The trenches should be well dug, about five or six feet wide, that the holes to receive the roots may be made sufficiently large. Much of the future prosperity of the orchard depends upon a judicious selection of the trees. Mr. Bucknal advises, that they be chosen the year before they are intended to be

planted, particular care being taken to obtain young, vigorous and healthy trees ; for cankered plants emit a vapour that is very detrimental to such as are sound. In taking up the trees from the nursery, the roots should be preserved of the full length, if possible ; the surface earth should be removed, and the running roots carefully traced and raised. If they must be cut, let it be done with a sharp instrument, and not hacked with a dull spade. The tap root, or that which penetrates straight down, may be shortened to the length of about one foot, and all broken or bruised parts should be removed. The small matted fibres should be cut off, as they are apt to mould and decay, and prevent new ones from shooting. The remaining side roots should be spread out to give them a horizontal direction under the surface, that they may be more immediately influenced by the sun, and their sap will become richer, and produce the sweetest and most beautiful fruit. Some well-rotted manure, mixed with mould, may be advantageously placed round the roots, the earth carefully pressed down, so as to come in contact with the roots in every part, and the trees placed the same side to the sun as they stood before. In transplanting trees, it may be observed, that they should not be replanted deep in the soil, since the most nutritive or salubrious parts of the earth are those within the reach of the sun's warmth, of the descending moisture, and of the air. And as the root fibres of trees, like those of seeds, always grow toward the purest air and brightest light, it follows, that the root fibres seldom rise higher in the ground than they were originally set, and seldom elongate themselves perfectly horizontally : so that when a fruit tree is planted too deep in the earth, it seldom grows in healthy vigour, either in respect to its leaf buds or flower buds. For a more particular description of the method of planting fruit trees, I quote the language of

Mr. Marshall, as follows: "Describe a circle about five or six feet diameter for the hole. If the ground be in grass, remove the sward in shallow spits, placing the sods on one side of the hole; the best of the loose mould placed by itself on another side, and the dead earth, from the bottom of the hole, in another heap. The depth of the holes should be regulated by the nature of the sub-soil. Where this is cold and retentive, the holes should not be made much deeper than the cultivated soil. To go lower, is to form a receptacle for the water, which by standing among the roots, is very injurious to the plants. On the contrary, in a dry, light soil, the holes should be made considerably deeper; as well to obtain a degree of coolness and moisture, as to be able to establish the plants firmly in the soil.* In soils of a middle quality, the hole should be of such depth, that when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard as it did in the nursery. Each hole, therefore, should be of a depth adapted to the particular root planted in it. The holes ought, however, for various reasons, to be made previous to the day of planting. If the season of planting be spring, and the ground and the weather be dry, the holes should be watered the evening before the day of planting, by throwing two or three pails full of water into each; a new but eligible practice. In planting, the sods should be thrown to the bottom of

* Agriculturalists are apprized of the fact that stones have a tendency to keep the contiguous earth moist and cool; and that when applied to the roots of fruit trees they produce beneficial effects. The honourable A. Wells, Esq. of Dorchester, found by experiment that those trees at the bottom of which he put a horse-cart load of small stones, when planted, greatly outstripped those which were planted without stones. The growth of the former in six years being from 12 to 14 inches in circumference one foot from the ground, while that of the latter was nine inches in the same time. See page 63.

the hole, chopt with the spade, and covered with some of the finest of the mould. If the hole be so deep, that with this advantage the bottom will not be raised high enough for the plant, some of the worst of the mould should be returned before the sod be thrown down. The bottom of the hole being raised to a proper height and adjusted, the lowest tier of roots is to be spread out upon it; drawing them out horizontally and spreading them in different directions, drawing out with the hand the rootlets and fibres which severally belong to them, spreading them out as a feather, pressing them evenly into the soil, and covering them by hand with some of the finest of the mould; the other tiers of roots are then to be spread out and bedded in the same manner. Great care is to be taken to work the mould well in, by hand, that no hollow-ness be left; to prevent which, the mould is to be trodden hard with the foot. The remainder of the mould should be raised into a hillock, round the stem, for the tripple use of affording coolness, moisture, and stability to the plant. A little dish should be made on the top of the hillock, and from the rim of this the slope should be gentle to the circumference of the hole, where the broken ground should sink some few inches below the level of the orchard. All this detail may be deemed unnecessary; by those, I mean, who have been accustomed to bury the roots of plants in the grave-digger's manner; but I can recommend every part of it to those who wish to insure success, from my own practice. Plants which have been transplanted in the manner here recommended, whose heads have been judiciously lessened, and which have been planted in the manner here described, seldom require any other stay than their own roots. If, however, the stems be tall, and the roots few and short, they should be supported in the usual manner, with stakes, or rather, in the following manner, which is at once simple,

strong, and most agreeable to the eye. Take a large post, and slit it with a saw, and place the parts flat-way with the faces to the plant, one on each side of it, and two feet apart, and nail your rails upon the edges of the posts."

It seems to be a well-founded opinion that young apple trees will not flourish advantageously if planted on the site of an old orchard, or near the place where old trees have died. William Coxe, esquire, of New-Jersey, the most experienced orchardist in the United States, has experimented with the view of ascertaining this fact; and the result has demonstrated the correctness of it in the clearest manner. He planted young trees in the middle space between the old rows, and sometimes near the stumps of old trees, which had been for many years cut down and decayed; he removed the old soil in digging the holes, and replaced it with rich earth mixed with manure, and gave to his trees all the advantage of high cultivation, yet they were manifestly inferiour in point of growth and vigour to those which were planted at the same season in his adjoining lots.

Having progressed thus far, the husbandman is now presented with a valuable orchard, planted and arranged in complete systematick order; and it may, if he please, be considered as the work of his own hands, from which he may anticipate high expectations of profit and amusement. Thus the value of a farm is greatly augmented, and the proprietor enjoys the satisfaction of bequeathing a rich inheritance to future generations. But his labour is not yet at an end; it will still require his fostering care, and unremitting attention. In vain do we plant, labour, and toil, if through neglect in a single point, we suffer our harvest to be wrested from our hands. Nor are we less culpable if we suffer a young orchard to be destroyed by the depredations of cattle, the annoyance of insects, and the

corroding canker, without applying the appropriate remedies. We suppose, then, of course, that the orchard is properly enclosed by a strong and close fence. We next proceed to cultivate the soil beneath, and between the trees, until they arrive at their complete size, as the quality, excellence, and maturity of the fruit will, in a great measure depend upon its proper culture. This process may be performed either with the plough, if due care be taken not to injure the roots, or with the spade around the trunks, and by these means both the fertility and health of the trees are promoted, and the soil itself improved for the purpose of raising potatoes, turnips, or other vegetables, which do not tend too much to impoverish the land. If, however, it is intended to cultivate clover, or other meadow grass for mowing, still it will be advisable to reserve a circuit round each tree, as extensive as the roots, to be kept open by tillage, that by frequent hoeing the fertilizing properties of rain, air, and dew, may more easily penetrate into the earth, and produce beneficial effects on the roots. The opinion prevails among some farmers, that clover has a tendency to retard the growth of fruit trees. If this be true of clover more than of any other grass, it may probably be explained from its luxuriant foliage excluding the influence of warmth, air, and light, from their roots. Mr. Kenrick, of Newton, observes, that he has found herds grass the most injurious to his trees.

MANURING.

It is well known to every farmer, that young fruit trees will flourish luxuriantly, while the ground is cultivated with various vegetable crops, and that the same tillage and manuring, which is required for the latter, will prove highly conducive to the growth and fertili-

ty of the former. In fact, it has been ascertained by experience and observation, that apples, pears, peaches, &c. attain to their highest perfection only when the soil about the roots is kept open, and frequently manured. It is by the chemical combination of air, warmth, and moisture, that the growth and vigour of plants and trees are essentially promoted and maintained. The process of nature is greatly assisted by such substances as cause the greatest degree of fermentation, when buried in the earth. Hence, all animal substances, from the great degree of fermentation created by their dissolution, will be found productive of the greatest utility. Among these, are dead animal bodies, horns, hoofs, bones, when reduced to fragments or powder, leather, shells, &c. To which may be added hair, wool, and woollen rags. These, applied to the roots, and a top dressing of swamp or pond mud, chip or compost manure, annually, or once in two years, will produce surprising effects, and the farmer will realize ample compensation by the increased quantity and improved quality of his crop. As an extraordinary instance of resuscitating an old worthless apple tree, by the application of manure, I quote from the Dom. Ency. a statement, which appeared in the Salem Register, of May, 1802. "In my garden is an apple tree, which about the year 1763, sprouted from the root of a former tree : it now girts three feet six inches. From 1784 to 1790, I observed it to be barren, and a cumberer of the ground ; year after year, being the prey of caterpillars, and exhibiting the constant appearance of innumerable warts within the outside bark, which at the time, I suspected was natural instinct in the insect for the propagation of its kind. In the spring of 1793, I tried an experiment for giving it new life, as follows : very early in the season, I directed my gardener with a hoe to cleanse the outside bark of such excrencences as might bear the ope-

ration with little difficulty. In the next place, I directed him to raise a wall of small stones round the tree, at the distance of one foot, and perhaps nine inches high, and then to fill the cavity with manure from the resource of compost. The effect in the succeeding season was truly worthy of notice. The warts disappeared, the bark clean and thrifty, and the tree so loaded with fruit as that about one third of the boughs broke and came to the ground with the cumbersome weight. Comparatively no caterpillars since, and, on an average, a very plentiful crop of fruit yearly. I was led to the experiment by taking notice of a pear tree that had been in a very similar situation, and had been resuscitated in a similar manner."

There is not, perhaps, in nature a more fertilizing application than the liquid substance which is left at the bottom of stercoraries and barn yards, after the more solid substance has been removed. This effervescing mixture contains the very essence of the food of plants, and it might be carried out in tight carts or casks, especially in a dry season, and emptied about the trunks and roots, in the cool hours of morning and evening, but on no account during the heat of a summer's day. The planter, however, ought to be apprized, that the process of manuring must not be carried to excess, as too great a stimulus applied to trees, facilitates the luxuriant growth of wood, and renders the branches less productive of fruit: or the trees may be stimulated to a preternatural exertion for a few years, when their prolific powers will be exhausted, and a premature decay induced. Fresh stable manure is supposed to be injurious to fruit trees.

There is another expedient, which is understood to have produced favourable effects in promoting the growth of young fruit trees, especially in grass land. The method was published some years ago by a German clergyman, and simply consists in spreading flax-

shaws, or the refuse of flax after it has been dressed, on the soil contiguous to the trunks of the trees, as far as the roots extend ; by which means their size, as well as their fertility, is remarkably increased. In the vicinity of the seacoast, a valuable substitute for refuse flax, may be found in fresh sea weed. I have employed this article with considerable advantage. Being laid thick round the trunk, it prevents the growth of grass and weeds, keeps the earth open and loose, and, I am disposed to believe, prevents field mice from injuring the bark of the trees in winter, as the salt with which this substance is impregnated is supposed to be obnoxious to those vermin. It occurs to me as highly probable, that a quantity of sea weed pressed round the trunks of fruit trees, extending three or four feet, would prove a remedy against the canker worm, by forming a compact substance, through which both the canker moth and worm would be unable to penetrate. It might also serve as a protection against the destructive worm, which bores into the tree near the surface of the earth.

Engrafted apple trees sometimes put forth blossoms and bear fruit when two or three years old ; but if this premature produce be permitted, the prolific powers will be greatly impaired, and the trees will suffer irreparable injury. If, therefore, the blossoms appear abundant, the fruit should be taken off as soon as formed, leaving 4 or 5 apples on each tree, to ascertain their size and quality. Even at a more advanced stage of growth, if part of the apples are taken off in season, the remainder will be much improved in all respects, and the trees will not only produce fruit in higher perfection, but the bearing branches will every year become more vigorous and fruitful. It has been observed, that trees, which begin their bearing gradually, are, in general, more disposed to afford an annual crop.

It is not to be expected, that the systematick plan and particular rules described in the foregoing pages, will accord with the views and circumstances of every agriculturalist. It may, in some instances, interrupt a course of field culture which the farmer has prescribed for himself, or his farm may not afford an eligible situation for a regular plantation of fruit trees. In such dilemma it may be convenient to plant trees in various parts of the farm, not otherwise occupied, as on the borders and corners of fields contiguous to roads, lanes, &c. In some instances, it is deemed a preferable method to set trees on the sides of a square field, the centre of which is left open for pasture or tillage; and such arrangement is not without its advantages. It has been observed, that apple trees produce a more abundant crop when the ground is trodden and manured by cattle in the winter; but they should by no means be suffered to browse on the branches. We are not, indeed, without examples of scattered trees, of spontaneous growth, occupying land which has never been broken by the plough, nor subjected to the hand of culture. From these, tolerable crops of fruit are occasionally obtained, which, although of inferiour quality, are nevertheless capable of being converted to useful purposes. With the view of showing the facility with which many natural disadvantages may be overcome, and an orchard reared in the most unpromising situation, I shall introduce here an extract from a valuable paper, published in the *Agricultural Repository*, No. 1. vol. 6, by the honourable John Wells, esquire, of Dorchester, one of the Trustees of the Mass. Agricultural Society. Mr. W. relates two instances of cultivating apple trees successfully in unfavourable situations. In the one, a low piece of strong stony land was taken. "As it was rather flat, it was ploughed in strips or dug in spaces about four feet square. As it was

necessary to plough a furrow between each row, the mode of ploughing in strips was found the best, as by turning the furrow towards the tree, the land was better drained. Besides raising the ground a little from the surrounding soil, half a buck load of loam was added, to raise the ground on which the tree was set. After this was done, the strips or squares, as the case might be, were appropriated to the culture of potatoes and garden vegetables. In a few places only, the trees failed from the insufficiency of the drain. But by opening the drain, and raising the ground by half a buck load of loam, I found, on setting out a new tree, it flourished equally with the rest. This orchard, now in eight years, is a most valuable one, and most of the trees would give half a barrel of apples. From this and other circumstances which have fallen within my observation, it appears that low land, if strong soil, and well drained, will give a fine orchard, and probably sooner than any other."

The next effort was made under totally opposite circumstances. "The object was to have an orchard on a particular spot, where the soil was thin and light, upon a plain or flat. The holes were dug four feet over. The two upper strata of black and yellow loam, were placed aside the tree. After this, about ten inches in depth of the gravelly, or poorer earth, was taken out and carted off, and a horse cart load of stones upset into the hole; upon these, a part of the upper stratum, or some dirt from the side of the road was scattered so as to fill up the interstices; since which the spots near the trees have been cultivated by planting four hills of potatoes round each tree. The result has been tolerably favourable with all; but the trees having the stones placed at the roots have exceedingly outstripped the others. The dimensions of the trees in the first experiment—a rich, low, black, stony soil, drained—were, at the expiration of eight years, fif-

teen to seventeen inches in circumference, one foot from the ground. This may be considered (the tree being small when set out) as a growth of about two inches a year. The growth in the second experiment, for six years, was twelve to fourteen inches, in the holes in which the stones were put, one foot from the ground. Where no stones were put, nine inches was the growth. It will thus be perceived, that the vegetation was most powerful under circumstances by nature least favourable. If, then, thus much can be done to counteract such disadvantages, it surely offers much encouragement to our efforts, and leads us to hope, that not only in this, but in other objects, they may be beneficially extended."

ORCHARD PRUNING.

It has been remarked, that the management of orchards is capable of being reduced to a system, under a few general heads, connected in the principle of making all trees in an orchard healthy, round, large and beautiful. There is no part of this management perhaps, so important, and which requires more skill, and at the same time is so little understood, as the process of orchard pruning. The necessity of commencing, and annually repeating this operation in the nursery, has already been inculcated. When this discipline is properly put in practice, at that early period of growth, there will be less employment for the pruning knife at all future periods; it will nevertheless be found indispensably necessary to retrench redundant or superfluous shoots and branches in every successive year of their existence. "To the neglect of pruning fruit trees in due season," says Mr. Yates, "and the unskilful manner of performing it, may, in a great measure, be ascribed the bad and unfruitful state of some of the orchards in America. This inatten-

tion and mismanagement, and, especially, the not amputating dead limbs, and extirpating all infected parts of fruit trees, subjects them to disease, mortification and death. An unpruned tree, left in a natural state, will bear fruit sooner than one that is pruned; for by pruning, the parts below the lopped or amputated branches become viviparous, and produce new *leaf* buds, which require several years before they will acquire sufficient maturity to generate *flower* buds, to produce an oviparous progeny; but unpruned trees grow and look irregular and unsightly; nor is their fruit to be compared to that of trees properly pruned and managed, in order to afford them a more equal advantage of the sun and air, by means whereof they will produce fruit better in size and quality."

The two great practical errors which have hitherto prevailed, and by which fruit trees have suffered irreparable injury, are, 1. The season of the year; and 2. The awkward and unskilful manner in which the operation has been performed. In general, the months of February and March have been considered as the preferable season for pruning, and not unfrequently the executioner is sent into the tree with his exterminating axe, where he commences an almost indiscriminate slaughter, leaving long projecting stumps, and disregarding equally the form and beauty of the tree, and the particular branches and spurs upon which the future crop principally depend. In March, the sap is retained in the roots, and the bark adheres closely to the wood; consequently, the wounds occasioned by the amputation of branches being exposed to the cold, penetrating winds and frosts, before the circulation of the sap, become dry, rotten, and cankered, and often crack open nearly to the main trunk. In old orchards, particularly, if limbs of any considerable size are lopped off, several inches from the trunk, before the sap is in active motion, the fresh bark

round the wood becomes dry, large cavities are formed, which rapidly extend towards the trunk and heart, and the tree is soon deprived of its health and vigour. This unskilful procedure has so long been in practice, that it need excite no surprise, that a large proportion of our old orchards exhibit a mortifying, disgusting spectacle of dead branches, rotten stumps and hollow trunks, verging to total ruin. The greatest cause of surprise is that our intelligent farmers should suffer their valuable land, year after year to be encumbered with such worthless lumber, fit only for the resort of vermin and insects; for it may be observed that the more delicate feathered tribe disdain to occupy such detestable ruins for the purpose of rearing their brood. The long life of different orchards, soil and situation being equal, will depend, it is said, more on judicious pruning than on any other circumstance. Young trees differ much in their natural form and tendency, and the mode of pruning should vary accordingly. The peculiarity of growth, which characterizes each kind, is easily discovered when from four to five or six years old; and this is the most favourable period to complete what was begun in the nursery, for the purpose of correcting any natural defects in their form, and giving the proper direction in their future growth. The most proper season for pruning fruit trees, unquestionably is when the sap-juice is in active motion toward the extreme branches. In our New England climate, we have the clearest indications that the sap commences its circulation about the 10th of April. From this period to about the last of May, whether the buds are just opening, or the blossoms fully expanded, the pruning should be accomplished. It would, for certain reasons, however, seem advisable not to delay the operation after the middle of May, as the branches are then so charged with a full flow of sap, that the bark would be apt to peel,

whereby unseemly wounds might be left, and canker induced: and besides, the undergrowth, whether grass or grain, might be so far advanced as to suffer injury by being trampled upon. For the purpose of performing this operation in a proper manner, a saw, chisel, and pruning knife, must be provided. It will next be requisite to have at hand some suitable composition to apply to the wounded parts, to defend against wet, cold air, or the scorching sun. It is immaterial whether we employ Forsyth's composition, or the clay as prepared for grafting, or an ointment composed of rosin, beeswax, and turpentine. Some prefer a composition of tar with a little beeswax, simmered together, to which some red ochre is added. This composition, or the above mentioned ointment, should be of a proper consistence to be applied to the wound with a knife or smooth stick, and they will adhere, and last two years without requiring to be renewed. With respect to the proper method of pruning, no particular unexceptionable rules can be prescribed; much must depend on experience and attentive observation. It is among the most important rules, however, not to amputate a large limb, close to the main trunk of a full grown tree, nor indeed a branch, which is too large at the place of excision to heal or to close over again, as you may give the tree its death-wound, by opening an avenue to the air and water, which induce rottenness, and, in course of time, the limb or trunk becomes hollow, frequently to the roots. In pruning, some regard must be had to soil and climate. If the situation be wet and cold, trees should be pruned more open for the benefit of sun and air, which are less essential in a dry sandy soil, where the fruit ripens better. Winter fruit trees should have their branches left wider asunder than summer fruit, as they require more warmth of the sun than the latter. The general shape of old

trees should be left substantially the same, that the ascending juices may continue, as much as possible, in their established channels. Care must be taken not to cut away too many large limbs at a time, lest too large a portion of the sap should remain inactive, and thus occasion mischief. Always prune at a fork, and remove the lower branch, that the wound may be on the lower side rather than the upper side. All large limbs should be cut first at some distance from the place where they are to be pruned, as the weight may peel the bark, and leave a bad wound ; and in order to prevent the same accident, the bark, on the under side, should be cut through before the limb is amputated. In every instance, after sawing off the branch, let the bark and edges of the stump be pared close and smooth with a sharp knife, and immediately apply the composition so as to cover the whole surface of the wound. This is more especially necessary when the operation is performed in a cold season, before the sap is in circulation. By this procedure the new growth or healing process immediately commences, and instead of an unseemly rotten cavity, as in the old method, the wound will, during the season, if not large, be completely healed over, and the tree remain sound and flourishing. It is to be observed, that the fruit of the apple tree is produced on short, thick, side, or terminal shoots or spurs, from one to two or three inches long. These spurs naturally proceed from branches two, three, or four years old, and as these branches increase in length, the fruit spurs increase in number, and they continue to be fruitful for several years. Mr. Forsyth always leaves the branches of three different years on the tree, and thus keeps them in a constant bearing state ; whereas, if left to nature, they would only produce a crop of fruit once in two or three years. All old ragged spurs, and useless snags and twigs, should be taken off close to the

trunk; no dead limbs should be suffered to remain, nor even thrifty branches that have an irregular tendency, running inwards, and rubbing against each other. Such branches as intersect or cross each other, and thus occasion confusion in the crown of the tree, ought to be removed, and all others cleared of suckers to their very extremities; and indeed it will be necessary to prune out a good proportion of the top branches, in order to spread open the crown of the tree, to admit a free circulation of air and the rays of the sun, which are as essentially necessary to mature and ripen the fruit. Those superfluous lateral branches which grow irregularly, and all dead wood, should be annually extirpated, to give the proper bearing branches sufficient room without injuring the beauty of the tree, leaving the fruit branches as nearly equidistant as possible. Such branches as have received any material injury ought to be removed. If the tree in its first or second sap tend to shoot abundance of wood, the young shoots should be pinched off while tender, but never cut while the sap is flowing, because the tree, by cutting at that time, is apt to run into wood, and the blossom buds liable to be injured by being deprived of sap. Never suffer a sucker to remain near the root, from one year to another, nor by any means upon the body or trunk, which is not intended to be permanent. Those vigorous young shoots, which often spring from old arms, near the trunk, and incline to grow up into the head, must be annually extirpated, lest they fill the tree with too much wood. A sufficient portion of fertile wood should be left in every part, but leave no useless branches, to exhaust the nutritive powers, and thereby accelerate the decay of the tree. Mr. Marshall, in his Rural Economy, observes, that "a redundancy of wood is the cause of numerous evils. The roots, or rather the pasturage which supports them, is exhausted unprofitably ;

the bearing wood robbed of part of its sustenance, and the natural life of the tree unnecessarily shortened; while the superfluous wood, which is the cause of this mischief, places the tree in perpetual danger, by giving the winds additional power over it, and is injurious to the bearing wood, by retaining the damps, and preventing a due circulation of air. The underhanging boughs weigh down especially when loaded with leaves, the fruit bearing branches they are preying upon, giving them a drooping habit, or at least preventing their taking, as they ought and otherwise would, an ascending direction; while those which grow within the head are equally injurious in crossing and chafing the profitable branches. The outer surface only is able to mature fruit properly. Every inward and every underling branch ought therefore to be removed. It is no uncommon sight to see two or three tiers of boughs pressing down hard, one upon another, with their twigs so intimately interwoven that, even when their leaves are off, a small bird can scarcely creep in among them. Trees thus neglected acquire, through a want of ventilation and exercise, a runty, stunted habit, and the fruit they bear becomes of a crude, inferiour quality. By some, we are advised never to suffer apple trees to begin to head short of six or eight feet, for the convenience of passing under them in ploughing, and to admit the warming and fertilizing influence of the sun and air to the undergrowth. But the horizontal and drooping branches are always the most productive of fruit, and this is less liable to be shaken off by the wind, and is more conveniently gathered by hand. Those who cultivate an orchard for the benefit of the fruit, must make the undergrowth a secondary consideration.

HEADING DOWN OLD DECAYED APPLE TREES.

According to Mr. Forsyth, when the tops of the branches of apple trees begin to die from old age or other cause, they ought immediately to be regenerated by giving them a new top. This is done by cutting off a few feet of their extremities over the whole tree, so as to leave it in a proper form. If the trunk is yet tolerably sound, the new branches will grow thriftily, and bear luxuriantly; and if you wish to vary your fruit, the sprouts, after one year's growth, and most frequently the same year, will be fit for inoculating, which succeeds equally well in the old as in the young trees. In heading down old decayed apple trees for the sake of symmetry, it will be necessary to cut at the forked branches as near as can be to the upper side of the fork, cutting them in a sloping manner to carry off the wet, and at the same time rounding the edges; and if any of the branches should have the canker, all the infected parts must be cut out. The composition must be immediately applied, to prevent the sun and air from injuring the naked inner bark. This operation should be performed in April or May, and, in the course of the summer, long thrifty roots should be thrown out; these should not be shortened the first year, but in the following spring they may be cut to six or eight inches long, according to their strength. In the next spring, after the first branches are headed, the remaining old branches may be cut out, and these will soon fill the head of the tree with fine bearing wood. In three years, if properly managed, trees so headed will produce more and finer fruit than a maiden tree that has been planted upwards of twenty years. The method above detailed should be adopted with some caution, for it has been found, that trees will not survive the loss of all their branches, if lopped off in one season; it is pref-

erable therefore, to cut and graft them partially every season until the whole is accomplished. It may also be remarked that Mr. Forsyth's mode of heading down old decayed trees, applies chiefly to those trees whose branches are all nailed to walls; it will be found difficult if not impracticable, to adopt his mode with large apple and pear standard trees. This must be left to the judgment and discretion of the cultivator.

DIRECTIONS

For making a composition for curing diseases, defects, and injuries in all kinds of fruit and forest trees, and the method of preparing the trees, and laying on the composition, by William Forsyth.

Take one bushel of fresh cow-dung, half a bushel of lime rubbish of old buildings, (that from the ceilings of rooms is preferable) half a bushel of wood-ashes, and a sixteenth part of a bushel of pit or river sand: the three last articles are to be sifted fine before they are mixed: then work them well together with a spade, and afterwards with a wooden beater, until the stuff is very smooth, like fine plaster used for the ceiling of rooms. The composition being thus made, care must be taken to prepare the tree properly for its application, by cutting away all the dead, decayed, and injured parts, till you come to the fresh sound wood, leaving the surface of the wood very smooth, and rounding off the edges of the bark, with a draw-knife, or other instrument, perfectly smooth, which must be particularly attended to: then lay on the plaster about one eighth of an inch thick all over the part where the wood or bark has been so cut away, finishing off the edges as thin as possible: then take a quantity of dry powder of wood-ashes, mixed with a sixth part of the same quantity of the ashes of burnt bones: put it into a tin box, with holes in the top, and

shake the powder on the surface of the plaster till the whole is covered over with it, letting it remain for half an hour to absorb the moisture ; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaster becomes a dry and smooth surface. Where lime rubbish of old buildings cannot be easily got, take pounded chalk, or common lime, after having been slacked a month at least.

As the best way of using the composition is found by experience to be in a liquid form, it must therefore be reduced to the consistence of pretty thick paint, by mixing it up with a sufficient quantity of urine and soap suds, and laid on with a painter's brush. The powder of wood ashes and burnt bones is to be applied as before directed, patting it down with the hand.

When trees are become hollow, you must scoop out all the rotten, loose, and dead parts of the trunk till you come to the solid wood, leaving the surface smooth ; then cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the composition, and as the edges grow, take care not to let the new wood come in contact with the dead, part of which may be sometimes necessary to leave ; but cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itself, and thereby fill up the cavity, which it will do in time so as to make, as it were, a new tree. If the cavity be large, you may cut away as much at one operation as will be sufficient for three years. But in this you are to be guided by the size of the wood and other circumstances. When the new wood, advancing from both sides of the wound, has almost met, cut off the bark from both the edges, that the solid wood may join, which, if properly managed, it will do, leaving only a slight

seam in the bark. If the tree be very much decayed, do not cut away all the dead wood at once, which would weaken the tree too much and endanger its being blown down by the wind. It will, therefore, be necessary to leave part of the dead wood at first to strengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker or gum oozing, the infected parts must be pared off or cut with a proper instrument. When the stem is very much decayed and hollow, it will be necessary to open the ground and examine the roots; then proceed as directed for hollow peach trees.

By using the composition in a liquid state, more than three fourths of the time and labour is saved; and I find it is not so liable to be thrown off as the lips grow, as when laid on in the consistence of plaster: it adheres firmly to the naked part of the wound, and yet easily gives way as the new wood and bark advance.

In his introduction to the American edition of Forsyth, Mr. W. Cobbett says, "During the last summer, (1801,) I went with a party of friends to be an eyewitness of the effects (of which I had heard such wonders related) of this gentleman's mode of cultivating and curing trees; and though my mind had received a strong prepossession in its favour, what I saw very far surpassed my expectations. Mr. Forsyth, whose book was not then published, did us the favour to show us the manuscript of it, and also the drawings for the plates, which are now to be found at the end of the work. After having read those parts of the manuscript which more immediately referred to the drawings, we went into the gardens, and there saw every tree which the drawings were intended to represent, and of which we found them to be a most exact representation. We examined these trees from the ground to the topmost branches; we counted the joints in the

wood ; ascertained the time and extent of its growth ; and, in short, verified every fact that the book related. To raise fine, flourishing wood from an old, cankered, gummy, decayed stem ; to raise as much wood on that stem in three years as could have been raised on the finest young trees in twelve years ; to take the rotten wood from the trunk ; to replace it with sound wood, actually to fill up the hollow, and of a mere shell to make a full, round, and solid trunk ; all this seems incredible, but of all this we saw indubitable proof." In the work just referred to, we have the valuable observations of Peter W. Yates, esquire, of Albany, respecting Forsyth's treatise, as follow : "Mr. Forsyth's treatise, is well calculated to rouse the care and attention of gentlemen on this side the Atlantick, to the cultivation and management of fruit trees. The perusal of his pamphlet, London edition, 1791, afforded him both satisfaction and astonishment. To renovate diseased trees fast hastening to decay, and to increase the quantity and meliorate the quality of the fruit, in the way prescribed by him, seemed almost incredible." But Mr. Y. was induced to make the experiment. Accordingly in May, 1796, he adopted the mode of process prescribed by Forsyth, on a young bearing (bonecretien) pear tree, the bark of which, as well as the alburnum or sapwood, and the heart wood, were dead from the ground upwards about five feet. He cut away all the dead part, leaving nothing but the bark on the opposite side, and applied the composition. The effects were soon visible : the external part of the wound, which composed about one third part of the trunk, was in a few days surrounded by a callus or lip, which continued to increase until the sap-flow was obstructed and stagnated by the next autumnal frost ; but by the subsequent annual flow of the juices, the callus increased so as to fill the wounded part with new wood. The old and new wood

united, and is covered with new bark. In many other instances, he made similar experiments on various kinds of fruit trees with satisfactory success. He is, therefore, of opinion, that Forsyth's remedy affords a radical cure for diseases, defects, and injuries in all kinds of fruit trees, and that in pruning, especially where large amputations are made, the composition ought always to be applied, as it prevents the exuding of the vegetable juices through the wounded parts, aids and precipitates the healing of the wounds, promotes the vigour and health of the trees, and adds to the size and flavour of the fruit.

The composition of Mr. Forsyth does not, at this day, sustain such high reputation as formerly. It is not supposed to possess great efficacy as a medicament when applied to diseased trees; and for the purpose of defence against wet and heat, it is not perhaps preferable to an ointment composed of rosin, beeswax, and turpentine. It is probable, that a composition consisting of clay, tempered with horse dung and urine, would be found of equal utility. We are not unacquainted with instances of surgeons acquiring great celebrity by the application of certain medicaments to old ulcers, when in verity the cure was effected by the efforts of nature. But as a remedy against insects, a strong decoction of tobacco, with the addition of a little quick lime, is, if I mistake not, of superiour efficacy to all other applications. It is therefore strongly recommended, that after scraping off the rough scales of bark, this wash be faithfully applied to the trunks of trees, from their roots to the branches, every fall and spring, by which, much may be done towards the annihilation of the tribe of destructive insects. A weak solution of potash would have a powerful effect as a remedy against insects, but both this and quick lime, on account of their caustic quality, should be employed with much caution; as a too free

application may produce injurious effects upon fruit trees.

MEANS OF PRESERVING THE HEALTH AND VIGOUR OF
FRUIT TREES.

To promote the health and vigour of fruit trees, Mr. Forsyth recommends the following method, and it has been practised in our country with the most decided advantage. Take any quantity of urine and soap suds, and add fresh cow dung, and a little slacked lime, sufficient to bring it to the consistence of very thick white-wash or paint. After having removed all cankered parts, and scraped off the rough bark or moss from the trees, this mixture is to be applied to the stems and branches with a brush, in the same manner as the ceiling or walls of a room are white-washed. This, if done in March or April annually, will effectually destroy the eggs of insects, and prevent moss from growing on the trunk and branches; it will also contribute to the nourishment of the tree, and render the bark healthy, so that in the course of the first or second summer, a fine new bark of a fresh and green appearance, takes the place of the old one. If this application be repeated in autumn, after the fall of the leaves, it will have a salutary tendency in destroying the eggs of numerous insects that hatch in autumn and winter. For the same purpose of Forsyth's mixture, white-washing with lime has been practised, and found very beneficial in producing similar good effects. The application of strong, undiluted soft soap is employed by Mr. Ogden, of Flushing, Long-Island. The soap applied by means of a brush, destroys the moss and softens the bark, and, when washed off by rain, acts as a manure to the roots. When Mr. O. began this process, his trees were covered with moss and old scaly bark, and bore bad crops; but in two years all the old

bark dropped off, and the trunks became as smooth as a young poplar. The soaping may be done at any season, and repeated, if necessary.

A correspondent of the Caledonian horticultural society, (Scotland,) recommends *clay paint* for the destruction of insects, and the mildew on fruit trees. The instructions are, that you take a quantity of the most tenacious brown clay that can be obtained; diffuse among it as much soft water as will bring it to the consistence of soft cream or paint; pass it through a fine seive, so that it may be made perfectly smooth and unctuous, and freed from any gritty particles. With a painter's brush dipped in the clay paint, go carefully over the whole tree, not excepting the young shoots. This layer, when it becomes dry, forms a hard crust, which, enveloping the insects closely, completely destroys them without doing the smallest injury either to the bark or buds.

Whatever promotes a free circulation of the sap, as cleaning the bark from scales, and scraping it to make it tender and yielding; and whatever helps to perfect the maturation of the sap in the leaves of the tree, by giving them a full exposure to the sun and air, as by cutting out the central branches when the head is too bushy, and giving it an expanded form, promotes the growth, general health, and productiveness of the tree.

In case the trees are observed to be *hide-bound*, as it is termed, when the bark cracks by reason of the stem growing faster than the bark, it will be necessary to pass the point of a knife perpendicularly through the outter bark only, from the ground as high as the branches, taking care not to injure the inner bark. It not unfrequently happens, that from the intense rays of the sun of summer, striking nearly at right angles, the sap on the south side of the trees becomes so coagulated as to occasion the death of the bark; canker ensues, and finally, the tree itself is entirely de-

stroyed. As a remedy for this serious evil, a coat of the above-mentioned clay paint, or Forsyth's composition, it is presumed will prove effectual. Tanners' bark put round the roots of apple and other fruit trees has been found to be of great utility. It keeps the ground loose, prevents the growth of suckers and grass, and guards against worms and insects.

DISEASES AND OTHER INCIDENTS WHICH RENDER FRUIT TREES UNPRODUCTIVE.

All the maxims relative to fruit trees, it is said, centre in the word *health*. The great object of the fruit farmer, says Marshall, is to produce a crop every year; and nothing is more likely to obtain it, than keeping the trees in perfect health, and endeavouring to prevent their bearing beyond their strength, in a general fruit year. The enemies of fruit trees, says the author, are a redundancy of wood, moss, spring frosts, blights, insects, an excess of fruit, old age. To these should be added canker. Some of them are beyond human reach, but most of them are within the control of art. The term *blight* is of vague signification. Black blighting winds are talked of every where, but no definite idea is any where affixed to the expression. That corn and fruit become unproductive without any visible cause, and that fruit trees are liable to be infected with insects, are certainly facts. But whether insects be the cause or the effect of blights, does not appear to be yet settled. With respect to blights, all the assistance which art can render, is to keep the trees in a state of healthfulness, and prevent, as much as possible, an excess of fruit. As old age cannot be prevented, we have only to consider how the productiveness of trees may be protracted. I have seen, says he, healthy bearing apple trees which now wear their second top. The first

tops being worn out, were cut off, and the stumps saw-grafted. Sometimes we see trees so far gone in decay, that their productiveness no longer repays their incumbrance of the soil. How injudicious, in such case, is the conduct of the proprietor, who permits such trees to remain year after year, imbibing and wasting the substance of his soil! *Moss* is chiefly, perhaps, owing to the nature of the soil, and cannot be altogether prevented; but it may in most cases, be checked, and its evil effects in a great measure avoided. "I have seen several orchards," observes our author, "in which the trees were almost entirely subdued by this vegetable vermin. Some of the trees with, perhaps, only one bough left alive, and others entirely killed, and yet suffered to remain, an incumbrance to the ground, and a disgrace to the country." It would appear, by the above observations of Mr. M. that the same culpable neglect in the management of fruit trees prevails in England as in our own country.

Blight, says another writer, means, the effects of cold winds, or hoar-frosts on the foliage and blossoms of trees. Easterly winds, accompanied with fogs, often produce blights; the buds are nipped, and the tender vessels burst, innumerable insects soon appear, and the branches become withered. "By accident," says Dr. Mease, "Mr. Cooper, of New Jersey, discovered some years since, that a tree upon which a number of iron hoops and other articles of iron had been hung, remained free from blight, while all the rest suffered severely. Since that year he has constantly encircled two or three branches of every tree with an iron hoop, and with uniform success. As a proof, he pointed out one tree with a withered limb near the top, and observed that he had neglected to defend it last year. Philosophers may speculate as to the theory of the operation of the iron, and cause of the blast, but practical men will be contented with a knowl-

edge of the important fact, which comes from a man of judgment and of an observing disposition, who has again and again satisfied himself that no deception or accidental circumstance occurred, by reference to which the preservation of his hooped trees could be accounted for."

CANKER.

Apple trees are very liable to be affected with the canker. This disease occasions the bark to grow rough and scabby, and turns the wood affected to a rusty brown colour; and if no remedy be applied, will in time kill the tree. It is by some described as a sort of gangrene, which usually begins at the extremities of the branches, and proceeds towards the trunk, killing the tree in two or three years. Peter Yates, esquire, of Albany, observes, that his fruit trees became affected with the canker, generally appearing on the southwest side of the body or trunk of the tree. The bark of the infected part at first appeared dark, and at length rough, wrinkled, cracked, and dead. The infection annually increased; it communicated to the alburnum or sap wood; the circulation of the sap-juice was obstructed; it gradually diminished; it stagnated; and the tree perished. The general opinion respecting the cause of this disease is, that it proceeds chiefly from the nature of the soil. Mr. Forsyth, however, proves from experience that it originates from the following circumstances, namely: injudicious pruning; leaving the foot stalks of fruit on trees after it has been gathered; bruises, arising from the use of ladders in collecting fruit; and dead shoots, left on trees during the summer. But, says Mr. Yates, "it seems extraordinary, that the fruit trees in this climate are almost invariably affected on

the southwest side of the trunk or body of the trees. There it generally commences, and continues to increase annually, until the infection is communicated to the limbs. If I might be permitted to hazard an opinion, I would account for it as follows: That it is caused by the hot rays of the meridian sun, which in that direction is most powerful, and strikes the tree nearly at right angles. The south side of trees grows faster, for there the vegetation is more rapid than the north: this may be seen by the concentrick rings of a tree when cut or sawed into logs. Fruit trees generally incline to the northeast, which exposes their trunk to the influence of that luminary in the spring, when the sap-juice is subject to alternate freezing and thawing. The motion of the sap (which ascends in the vernal months in all deciduous trees) is accelerated by the hot rays of the sun at southwest. It is retarded and stagnated in the cool of the nights, whereby the irritability of the vegetable vessels is decreased for want of a sufficient stimulus of heat; and by this alternate thawing and freezing of the sap-juice, and particularly on the southwest side of the tree, where the sun's rays are most powerful, the vegetation is at last destroyed, and mortification ensues." It frequently happens, that scions for grafting are taken from infected trees; and the young trees produced in this way are, as might be expected, peculiarly obnoxious to the disease. From whatever cause the canker may arise, Mr. Forsyth directs all the diseased parts to be cut out with a sharp instrument; and if the inner white bark be affected, this also must be cut away, until no appearance of infection remains. The composition must then be applied. This method Mr. Yates has found by experience to prove effectual. (See directions for making and laying on the composition, page 73.) Mr. Cooper, of New Jersey, has found the best remedy for canker to be a composition

of rosin, tallow, and beeswax, of a proper consistence to stick, after taking off all the dead parts.

MOSS, AND SCALY BARK, AND DECORTICATION.

Fruit trees, in all soils, and in all situations, are liable to have their trunks covered with moss, and their bark rough and scaly. Besides the unseemly appearance, fruit trees suffer much injury by these causes, if suffered to continue without a remedy. The moss is easily removed by scraping with the back of a knife, and rubbing with a cloth, after a rain, or in damp weather; and the scaly bark may with equal facility be scraped off with a hoe or knife. This operation should be performed every spring, and immediately after, the trunks and larger branches should receive a proper coat of some of the compositions already mentioned. Either the washing with the liquids, or the application of undiluted soap, (see page 79) will effectually remove any remains of moss, and, if occasionally repeated, the health and vigour of the trees will be restored, and in two years the bark will appear fresh and smooth. In some diseased condition of the bark of apple trees, the experiment of disbarking the whole trunk from the ground to the branches, has been successfully practised. Dr. S. L. Mitchell, of New York, in the summer of 1799, deprived the whole body of one of his apple trees of the bark, without injury to its leaves or fruit; and in two months an entire new coat of bark was found surrounding the wood on every side. Dr. M. however, observes, that though he has several times been witness of the harmlessness of the practice, it looked to him still like a very violent and hazardous remedy. This sort of decortication is by no means a novelty. Many ancient writers have observed, that in cases where the outer bark has become rough and full of

chinks, so that small insects deposit their eggs and produce their larvæ below this bark, it is a good practice entirely to remove it. Of late years, Mr. Knight practised decortication on some old fruit trees, particularly red-streak apples, and found the new growth thus produced quite surprising; so that the growth of some trees, deprived of their bark in 1801, exceeded in the summer of 1802 the increase of the five preceding years taken together. This method has been adopted in various parts of New England, sometimes with complete success, and again, the result has been the entire destruction of the trees. This failure is attributed, by an ingenious writer in the Massachusetts Agricultural Repository, to a want of skill in the operator; observing that he has seen a young apple tree in the town of Hallowell, which, on account of some defect, was stripped of its bark about ten years prior to his writing, the longest day of June, and which still lives and bears fruit. Much of its success, it is said, depends on the proper time and manner of performing the operation. It should be done while the tree is in the full flow of sap, about the middle of June, or on the longest day of that month, and the bark should be peeled off entirely smooth to the Alburnum. Dr. Holyoke, of Salem, some years since made the experiment on an old pear tree in his yard, that ceased bearing, and restored to it its wonted fecundity.

Fruit trees are liable to have their bark torn off by field mice, sheep, and various accidents; to remedy which, take some strips of bark from a tree of the same species, about two or three inches in width, and place four or five of them, according to the size of the wound, perpendicularly round the naked part. The edges of the torn bark being cut smooth, the sound bark should be a little raised, and the slips inserted beneath it to promote the circulation of the

sap. The slips are to be bound quite tight with rope-yarn, and the composition of Forsyth, or a mixture of loam and cow-dung, must be applied, and this covered with a coarse cloth. This method of treatment has been successfully practised; the slips adhere closely, and, being full of sap, soon become firm and smooth. Instead of bark slips, small twigs may be successfully applied in a similar manner.

SPRING FROSTS, AND OTHER CAUSES AFFECTING THE BLOSSOMS.

Every cultivator of fruit trees has experienced more or less disappointment in his expected crop of apple, pear, and other fruit trees, after having exhibited the fairest prospect in the vernal season. While in full blossom, and the fruit just beginning to form, the petals are cast off like the dead leaves in autumn. This incident is said to be occasioned by warm and drying winds, by which the vigour of the trees is diminished. In one instance it appears that a remedy has been successfully applied, and the loss and inconvenience prevented. J. Sowerby, esquire, in the spring of 1815, observed that the drying winds generally succeeded the blossoming of his fruit trees; the whole used to be blown off about the time of the setting of the young fruit. Deeming it probable that a good dose of water at the roots would strengthen the tree, and save the fruit, the experiment was tried, and the good effect was perceived in twenty-four hours; the young fruit then resisted the attack of the winds, and a large crop was produced. Not only were the trees enabled to produce their fruit in abundance, but also to increase them in size to nearly double. The blossoms of apple trees are liable to be injured or destroyed by various other causes; as severe cold, a hazy state of the atmosphere, frosts, and insects of various kinds; and

Mr. Knight has remarked, that they also fail frequently from want of impregnation when the weather is unusually hot and dry, or when cold winds prevail, as he often observed the farina to wither and die on the antheræ in such seasons.

Spring frosts are an enemy, against which perhaps it is most difficult to guard orchard trees. "Dry frosts," says Marshall, "are observed to have no other effects than keeping the blossoms back; consequently, are frequently serviceable to fruit trees. But wet frosts, namely, frosts after a rain, or a foggy air, and before the trees have had time to dry, are very injurious even to the buds. An instance is mentioned, in which a flying hazy shower in the evening was succeeded by a smart frost; that side of the trees, against which the haze drove, was entirely cut off, while the opposite side, which had escaped the moisture, likewise escaped the effect of the frost. Much, however, may depend on the strength of the blossoms. When the buds form, and the blossoms break forth with unusual vigour, they are enabled by their own strength to set common enemies at defiance. But, on the contrary, when the blossoms sicken in the bud, and those which open are weak and languid, scarcely an apple will be produced. The assistance, therefore, required from art, in this case, is by keeping the trees in a healthy, vigorous state, to enable them to throw out a strength of bud and blossom; and by keeping them thin of wood, to give them an opportunity of drying quickly before the frost sets in." Apple blossoms are, in some seasons, injured by the devastations of an uncommon number of insects produced from a species of black flies, which deposit their eggs in the bud at its first opening, and which, by feeding on the heart of the bud, soon occasion it to contract and drop. To remedy this fatal effect, we are advised to collect heaps of long dung, wet straw, weeds, &c. to dispose

them in different parts of the orchard, and set fire to the heaps in that quarter from which the wind blows, so that the smoke may thoroughly fumigate all the trees. Thus the insects, which are supposed to be brought by the wind, will be prevented from depositing their eggs.

CANKER WORM. PHALÆNA VERNATA PECKII.

Of all the numerous tribes of insects which infest fruit trees, and disappoint the hopes of the cultivator, the *canker worm*, during the years of its prevalence, is the most to be dreaded. This destructive insect has, therefore baffled the efforts of man, and in despite of all means of prevention as yet devised, commits its depredations, and deprives whole orchards of foliage and fruit. The miller, or moth, rises from the earth in the spring, conceals itself during the day in holes and crevices under the loose bark of apple trees, and may be easily found by searching. The male has wings, but the female appears to have none; they are enabled, however, to ascend the trunk of the tree, and crawl towards the extremities of the twigs, where they deposit their eggs, and as soon as the leaves unfold and sprout forth, the worm bursts from the egg and commences its ravages. The worms soon spin for themselves long threads, similar to those of spiders, by which they are suspended in the air, and wafted by the wind from tree to tree, and from one adjoining orchard to another, preying voraciously upon the foliage, and giving the trees the appearance of being burnt. Professor Peck, of Cambridge, has favoured the publick with the most satisfactory history of this insect, which has yet appeared. According to him, the worms descend by the trunks of the trees in June, and immure themselves in the earth near the trunks, and rarely, if ever, more than three to four feet dis-

tant ; in grass land from one to four inches deep, and in ploughed land not more than to the depth of seven or eight inches. He has also ascertained that a part of the canker moths rise in the autumn and deposit their eggs. They are such as were an inch or two below the surface ; those which lie deeper are not affected by the transient changes of the atmosphere in November, and do not rise till spring. The chrysalis state comes in twenty-four hours after the larvæ has penetrated the earth, and it appears that the insects are soon perfect, since a course of warm weather has been found to raise some of them from the earth in November. Those which rise in November are not very numerous, compared with those which rise in the spring, but being very prolific are exceedingly injurious, if no means are taken to prevent their ascending the trees ; as the winter's frost does not kill the eggs. The warmth of the season at the time of the descent into the soil is favourable to the perfect development of the insect in the chrysalis, particularly those which are nearest the surface, while those at the depth of six or seven inches are longer in coming to maturity. The first are perfect in September, and require only to be excited to burst from their confinement ; but they cannot be excited until they have passed through a degree of cold sufficient to make them sensible of the mild temperature of the atmosphere which occurs in November. The excitability of such as lie deeper, and are not accessible by cold till a later period of the season, is not so soon accumulated, nor are they sensible of slight changes of temperature, which affect only the surface ; they, therefore, do not leave the earth till the spring, when the warmth of the air is longer continued, and penetrates to the depth at which they lie. To prevent the dreadful ravages of the canker worm, the great object is to keep the female from ascending the trees. For this

purpose various methods have been proposed. A writer in Carey's American Museum, August, 1792, says, "Canker worms never destroy apple trees which stand on a stiff clay, or in low ground, where water stands long in the spring. The reason for this is obvious. The canker worm, about the 10th of June, descends into the earth, there to lie till the next spring, when the miller rises and ascends the trees. This worm is not strong, nor furnished with the necessary implements for digging into a hard stiff clay; of course it cannot bury itself in clay, and is not fond of gravel. The writer therefore proposes to lay a covering of stiff clay round trees which stand on sand or other light earth. This covering or layer may be thrown upon the top of the natural soil, which may be removed to the depth of a few inches. If the clay be laid on in summer, after the descent of the worm, it may prevent the miller from rising in the spring; if when the worm is upon the tree, it may prevent its finding a lodging; but as in the latter case, the worm might travel some distance beyond the limits of the layer, it might be better to form the layer round the tree after the descent of the worm in June."

According to Dr. Dean's New-England Farmer, it is now about eighty years since New-England was first visited by these destructive insects. He observes, if any person could invent some easy, cheap, and effectual method of subduing them, he would merit the thanks of the publick, and more especially of every owner of an orchard. Several methods have been tried with some degree of success. 1. Tarring. A strip of canvass is put round the body of the tree, before the ground is open in the spring, and well smeared with tar. The females, in attempting to pass over it, stick fast and perish. But unless the tarring be renewed very frequently, it will become hard, and permit the insects to pass safely over it. And renew-

ing the tar in season is too apt to be neglected, through hurry of business and forgetfulness. The insects are so amazingly prolific, that if ever so few of them get up, a tree is ruined, at least for the ensuing season. 2. The pasturing of swine in an orchard Dr. Dean supposes to be an excellent method, where it can conveniently be done. With their snouts and their feet they will destroy many of the insects before they come out of the ground; and he has never known any orchard constantly used as a hog-pasture, wholly destroyed, or even made wholly unfruitful by worms. But this method cannot always be taken; and if it could, he does not suppose it would be quite effectual. He considers tarring as the preferable antidote, and gives the following directions for applying the article in the most effectual manner.

In the first place, it is necessary to begin the operation very early in the year. Not observing this caution has occasioned the want of success which many have complained of; for it is certain that the bugs will begin to pass up as soon as the ground is so much thawed, that they can extricate themselves; which is, in some years, as early as February. Therefore, to make sure work, it is best to begin as soon as the ground is bare of snow in that month, that the first thawing of the ground may not happen before the trees are prepared; for beginning after ever so few of the insects have gone up, the labour will all be lost. Another thing to be observed is, to fill the crevices of the bark with clay mortar before the strip of linen or canvass is put on, that the insects may not find any passages for them under it. Having put on the strip, which should be at least three inches wide, drawn it close, and strongly fastened the ends together, a thumb-rope of tow should be tied round the tree, close to the lower edge of the strip. The design of doing this is, that the tar may not drip, nor run down

on the bark of the tree, which would injure it. When all the trees of an orchard are thus prepared, let the strips be plentifully smeared with cold tar, put on with a brush. It should be renewed once a day without fail. The best time is soon after sun-set, because the insects are wont to pass up in the evening, and the tar will not harden so much in the night as in the day, because of the dampness of the air. The daily task must be renewed, and performed with the greatest care, till the latter end of May, or till the time when the hatching of the worms is commonly over, which will be earlier or later, according to the difference of climate.

Another mode of tarring, and which bids fair to be preferred to the foregoing, is as follows : Take two pretty wide pieces of board ; plane them ; make semi-circular notches in each, fitting them to the stem or body of the tree ; and fasten them together securely at the ends, so that the most violent winds and storms may not displace nor stir them. The crevices betwixt the boards and the tree may be easily stopped with rags or tow ; then smear the under sides of the boards with tar. The tar being defended from the direct rays of the sun, will hold its tenacity the longer, and, therefore, will not need to be frequently renewed ; and the trees may be secured more in this way from the dripping of the tar, as a margin of two or three inches, next to the tree, may be left unsmeared.

“The remedy of tarring,” says professor Peck, “was probably first suggested by the structure of the female insect, which, happily for man, has no wings. If this remedy were diligently and universally used, it would very likely rid us of this pest ; it must, indeed, be granted, at a considerable expense. But the negligence of many will counteract the vigilance of a few, whatever remedy may be proposed or discovered. Mr. P. recommends, 1st. Turning up the ground care-

fully in October, as far as the branches of a tree extend, to half a spade's depth or five inches, so as completely to invert the surface. A great number of chrysalids would thus be exposed to the air and sun, and of course be destroyed. 2dly. Breaking the clods and smoothing the surface with a rake, and passing a heavy roller over it, so as to make it very hard, and without cracks. By these two operations every vestige of their downward path would be completely obliterated, and if any remained undisturbed below the stratum of earth which has been turned up, they must remain there, as it is utterly impossible for them to force their way in the moth or miller state, through such an obstruction as this layer of earth would oppose to them. In grass grounds the sods should be turned with the grass side down, and placed side by side, so as to be rolled; the earth from which they were taken should be loosed and rolled also. It is probable, that with this treatment no moths would rise in the fall. The winter's frosts would heave and crack the smooth surface, but it might be smoothed and hardened by the roller or other means, in March, with much less trouble, time and expense, than the long course of tarring requires. As lime, when slacked, is reduced to an impalpable powder, and is thus well adapted to close the openings in the surface to which it may be washed by rains, Mr. P. is inclined to think its good effects are produced in this way as well as by its caustick quality."

Mr. Kenrick's method of destroying the Canker Worm.

John Kenrick, esquire, of Newton, proposes as follows: From any time in June, after the worms have entirely disappeared, until the 20th of October, let the whole of the soil surrounding the trees, to the extent at least of four feet from the trunk, and to a suit-

able depth, be dug up and carted away to a distance from any trees the canker worms are in the habit of feeding upon; and let there be returned an equal quantity of compost, or rich earth intermixed with manure. The earth taken from the trees will make a substantial ingredient in compost. If a few straggling canker worms appear on any of the trees the spring following, let such trees be marked, that the operation may be repeated the succeeding summer. The process proposed will not only accelerate the growth, and increase the fruitfulness of the trees, but will prove a considerable guard to them against the depredations of moles in the winter following; advantages which will abundantly outweigh the whole expense. But the pre-eminent advantage obtained, will be to have captured those destructive invaders, broken up and completely destroyed their encampments. Annual tarring, the only remedy in general use, instead of being beneficial to the trees, is allowed on all hands to be injurious. The seasons being variable, it requires considerable care and skill to know when to begin; if one day too late, some of the canker moths will have ascended the trees; if four days too early, so much labour and tar are lost. The same difficulty occurs in knowing when to cease tarring. The business must be attended to exactly in the right time, whether it rain or shine, and the operation repeated considerably more than twenty times in every season; and the average of various estimates of the annual expense of tarring each tree amounts to full ten cents. The method I have proposed, says Mr. K. appears to be perfectly adapted to the convenience of the practical farmer. He will avoid the trouble and expense of purchasing and applying tar, lime, or any other article; he can perform the operation when most at leisure, and with a certain prospect of ample reward for his labour, even if no damage were apprehended

from the canker worm ; and if the operation is performed in June, he can raise a crop of potatoes round the trees the first season. Hence it is obvious, that several very important advantages will be obtained in addition to the prime object ; and the prudent farmer, who adopts this method, will have in view the most, if not the whole, of the following distinct objects :

1. Extermination of the canker worms.
2. Growth of the trees.
3. Fruitfulness of the trees.
4. Defence against the moles.
5. Several crops of potatoes.
6. Manufacture of compost.

Mr. Kenrick never having had any canker worms on his farm, could not personally prove the efficacy of the method proposed, by actual experiment. But it should be strongly recommended to the attention of cultivators of orchards, and it is hoped the publick may be made acquainted with the result of every trial.

John Lowell, esquire, (Mass. Agricul. Repos.) observes, that "the expense of tarring an orchard for several years, together with the injury sustained by the trees in the common mode of doing it, will be nearly equivalent to a total loss. The improvements, introduced by Mr. Parsons, and other cultivators, of surrounding the trees with canvass and rope-yarn, and stopping the descent of the tar by a bandage of coarse hemp, together with the mixture of the tar with oil, so as to keep it longer in a soft state, have very much diminished the inconvenience of the old practice. Still much remains to be desired. The process is imperfect, unless performed as faithfully in the fall as in the spring. If your neighbours are inattentive, you may be subjected to this labour for ten or twenty years, and your orchards will scarcely pay the continued and accumulated expense. Something further seems to be desirable ; some mode more simple, less

expensive, more effectual. In the southern states, I perceive, some persons are still ignorant of the natural history of this insect, and regret that it has not been examined and described by scientifick men. We have nothing left to be desired on this head. The description of the canker worm, by professor Peck, is very satisfactory, and only leaves us to regret that the same ingenuity could not have devised some speedy, simple mode of extirpating or checking them. Until some effectual mode is discovered, I think we should make constant experiments, and communicate fully the results, in the hope that if our trials shall not prove in every case successful, they may stimulate others to more happy ones.

"I had understood that Mr. Josiah Knapp, of Boston, was induced to try the effect of air-slacked lime. He put it round one of his trees in the spring of 1814, and I have been assured, not only by him, but by another respectable friend who examined it, that it was fully successful. The tree was in a small garden in Boston, surrounded with other trees, which were filled with the worms, and this one wholly escaped, except that a few appeared to have attacked its extremities, where they were interlocked with the other trees. I mentioned this fact to a Rhode-Island gentleman, who informed me that, in that state, they had used the rubbish collected from the breaking of flax, and it had effectually prevented the rise of the insect. I resolved to make the experiment of lime on an extensive scale. As the insects rise in the fall, I determined to put the lime on in autumn. For this purpose I had the turf dug in around sixty apple trees, and the earth laid smooth. I then took three hog-heads of effete or air-slacked lime, and strewed it an inch thick round my trees, to the extent of about two or three feet from the roots, so that the whole diameter of the opening was from four to six feet. I tarred

these trees as well as the others, and although I had worms or grubs on most that were not limed, I did not catch a single grub where the trees were limed. I do not mean to speak with confidence; I am, however, strongly encouraged to believe the remedy perfect. It was ascertained by professor Peck, that the insect seldom descended into the ground at a greater distance than three or four feet from the trunk, and to the depth of four inches, or that the greater part come within that distance. The lime is known to be destructive to all animal substances, and I have little doubt that it actually decomposes and destroys the insect in the chrysalis state; at least, I hope this is the case. There are many reasons which should encourage the repetition of this experiment. The digging round the trees is highly useful to them, while tarring is very injurious. The expense is not great; a man can dig round fifty large trees in one day. The lime is a most salutary manure to the trees. After the spot has been once opened and limed, the labour of keeping it open will not be great. Three hogsheads of air-slacked lime, or sweepings of a lime store, will suffice for fifty trees, and will cost three dollars. As it is done but once a year, I think it cannot be half so expensive as tarring. I repeat it, sir, that I mention my experiment with great diffidence, as being the first of my own knowledge. It may induce several persons to try it in different places, and where trees are surrounded with others which are treated differently. All I pray is, that it may prove to be successful, and relieve us from this dreadful scourge, which defaces our country, while it impoverishes and disappoints the farmer. If it should succeed, Mr. Knapp will merit the thanks of the publick for his ingenious experiment."

The foregoing valuable communication from one so highly deserving of confidence, it is hoped will have

its proper influence, and encourage every proprietor of an orchard to make the experiment whenever the canker worm shall again menace us with its ravages. The application of lime appears to be by far the most eligible remedy that has heretofore been proposed. It forms, after being exposed to rain, a hard crust, impenetrable to moths or worms. If it should be generally adopted, it is very probable that these pernicious insects will be finally exterminated. It might be profitable to make the experiment upon a small scale, by confining some of the moths or worms, in their different states, in a box of earth, and applying the lime, so as to ascertain how far they will be able to progress through it, and whether the lime will have the effect of decomposing them. It has already been intimated, (page 61,) that flax-rubbish and sea-weed, might be laid round orchard trees so as to prove a remedy against these insects. Those substances, when beaten down by rains, soon become so firm and solid, as to prevent the growth of grass, and I should judge it would be impossible for the insects to penetrate through them.

It was recommended by Dr. Dean, to endeavour to effect the destruction of canker worms through the agency of swine. These animals appear to possess a natural instinct directing to search with their snouts for vermin and insects, which conceal themselves in the earth. They should, when circumstances permit, be suffered to run unrestrained, in orchards, during autumn and spring, for that purpose. A general resort to this expedient, might have a happy tendency in preventing the annoyance of these, and other insects, in our orchards.

It is well known, that several species of birds feed voraciously upon the canker worm, and other tribes of insects; it would be advantageous, therefore, to encourage the increase of the feathered tribe, by all the means in our power.

CATERPILLAR. WEB-WORM. PHALÆNA NEUSTRIA.

These vermin are so truly disgusting in their nature and appearance, and so injurious by their devastations, that every farmer should consider it disgraceful to suffer his orchard to be infested by them; yet it is not uncommon to see numerous branches of valuable fruit trees entwined with nests, filled with these industrious reptiles, by which the foliage and fruit are destroyed. During an excursion this season, I have witnessed the disgusting sight of more than twenty large caterpillars' nests on a single tree, and almost every green leaf devoured. It would consist more with the interest and credit of the proprietor, were such neglected trees no longer permitted to encumber the ground.

The eggs from which caterpillars are produced, are attached in clusters to the small twigs by a brownish coloured miller, in the month of August, and are securely covered with a gummy substance, unsusceptible of injury by the weather during winter. The young brood is hatched by the warmth of the sun, just in time to prey upon the fresh leaves as they appear in the spring. The numerous family from each cluster of eggs, immediately unite in the labour of constructing a nest of strong web, which affords them a shelter from the inclemency of the weather, and a secure retreat from the dews at night. They continue to feed upon the leaves until about the last of June, when they abandon their habitation, and stroll to some dry, secure place, where they envelop themselves in a close covering of an egg-shaped, roundish ball, very similar to the *cocoon* of the silk worm. In this chrysalis state, they continue a few weeks, and in the month of August they burst forth in the form of a brownish coloured miller, the female of which soon wings her way to the apple trees, and deposits her

eggs on the twigs, in the same manner as her progenitor in the preceding year. Thus is an annual progeny generated, and in this manner is the species perpetuated. It will therefore appear evident, that if proper care be taken to destroy these vermin annually, and if all proprietors of orchards will act in concert with this view, the species may be entirely annihilated. The clusters of eggs which contain the young brood, very nearly resemble in colour the bark of the tree, but by a vigilant search they may be detected, and at any leisure time after the month of August, the twigs to which they are attached, should be cut off, and burnt, or the eggs otherwise destroyed. But when this is omitted, and the caterpillars are hatched, and have constructed their nests, and are rambling among the branches for food, a different method must be adopted. The trees during the spring and first part of summer should be carefully searched every two or three days, in the morning or evening, while the insects are enclosed in their tents, when they are easily crushed with the fingers, or some instrument, or the branch may be cut off and destroyed. It is asserted that spirit of turpentine, or common fish oil, applied to the nest, will penetrate through, and kill every caterpillar within it; and it is also said, that soap suds will answer the same purpose. The honourable Timothy Pickering has communicated to the Mass. Agricultural Society, an eligible method of exterminating caterpillars, more especially when their nests are constructed on the extreme branches of large trees not accessible by ladders. It consists of a brush made of hog's bristles introduced between two stiff wires, closely twisted, similar to the common brush for cleaning the inside of bottles. A piece of wire full one tenth of an inch in diameter, about three feet long, doubled, and leaving a small loop in the middle, is closely twisted for the length of about eight or ten inches from the

loop ; and then the bristles being introduced between the remainder of the two branches of the wire, and these closely twisted, upon them the bristles are immoveably fixed ; and thus is formed, after being uniformly sheared, a cylindrical brush, about six inches long and two and a half in diameter. This brush is fastened to the end of a long pole, having a groove about seven or eight inches long at the small end, in which the twisted wire of the brush was laid and bound on with strings. In using the brush, press it on the nest, and turning the pole in the hand the web is entangled with the bristles and removed ; or otherwise, you rub the fork of the limb inside and outside with the brush, when the nest and worms are surely killed or brought down. The pole may be longer or shorter according to the distance which you have to reach. Numerous other methods have been from time to time suggested for the destruction of these vermin, but they may be destroyed with great facility by a little industry, with the hand or the brush, if repeated two or three times a week during their season. It has recently been ascertained that some of the insects or millers which deposit their eggs from which the caterpillar is produced, are left in old nests after the caterpillars have deserted them in the month of June. The destruction of the old nests therefore, and the insects contained in them, before they have time to deposite their eggs in August for the next year, will prove the most effectual method of destroying these troublesome vermin for all future seasons and eventually of annihilating the whole tribe.

THE WORM CALLED THE BORER.

An interesting paper by W. Denning, Esq. on the subject of the alarming decay of apple trees, is inserted in the first volume of the transactions of the New

York agricultural society; from which it appears, that on cutting down some apple trees, which were far decayed, he discovered two worm holes running perpendicularly, from the tap root, through the heart. These holes were large enough to admit a pipe stem, and reached about fourteen inches above the surface; and from each hole a worm was taken. In some trees eight or ten holes were found. Mr. Denning proposes no remedy; but Dr. Mease, editor of the domestick encyclopedia, observes, that the worm must be searched for with a wire, and bored out. The publick are particularly indebted to J. Prince, Esq. and to Mr. E. Hersey, of Roxbury, for their mode of destroying this pernicious insect.

From the Massachusetts Agricultural Repository, volume iv.
On a worm which attacks the apple tree. By John Prince,
Esq.

JAMAICA PLAINS, JULY, 1819.

DEAR SIR,—I have, within a few years past, lost a number of apple trees of from ten to fifteen years old, and was not able to account for it. My young trees also, that were beginning to bear, produced chiefly wormy and knurly fruit. The last year I found what I supposed to be the cause, which was a small, white, ringed worm, about three quarters of an inch long, with a dark coloured head, (I believe the same that attacks the peach tree,) attacking them at and just below the surface of the ground. I mentioned the subject to professor Peck, yourself, and several other gentlemen, who had never heard of this destroyer of the apple tree. I feared much the loss of my trees, of which I have near one thousand, and mostly of my own planting. This spring, a man, who was grafting for me some old trees, told me he had trees that had been affected in the same way, and that they were very easily got rid of, by digging round the trees, and

clearing away the earth to the roots, and then, with a sharp pointed knife, a chisel, or gouge, (and a small wire to probe, if they were deep in the tree,) they were easily destroyed. I employed him in June for this purpose. I believe there was not an apple tree on my farm but had some worms; and from some of them twenty-four were taken; and the trees almost entirely girdled, and would not, probably, have lived through the year. After taking out all that could be found, the wounds were covered over with grafting clay, and a large proportion of dry wood ashes, mixed, and the earth then returned to the tree. I shall have them again examined this fall, and looked at every spring. The trouble is much less than would be imagined, till tried. One capable man will dig round and turn the sods, two or three feet from the tree, (and which is also extremely beneficial to young trees in grass ground,) and examine at least thirty trees in one day; and in garden, or ploughed ground, one hundred.

When it is found how little expense is required to extract these destructive little worms, I do hope those persons who have young trees particularly, would examine them as soon as possible. They are soon discovered by the worm casts, or saw-dust borings, which should be followed, and wholly extracted.

I have also lost several mountain ash and quince trees by, I believe, the same destroyer.

The *borer*, says Mr. Hersey, rarely exceeds one inch in length; it has a reddish head, and its body is white. It is sometimes mistaken for the apple worm, but it differs in its nature from that insect. The egg which produces the *borer* is deposited very near the surface of the earth, and is seldom found more than three or four inches below or above the surface of the ground: it sometimes however is discovered in the crotch of the tree. The insects enter the trunk of

the tree at the distance mentioned above, and ascend from six to fifteen inches ; in their progress they never interfere with each other, and therefore every *borer* inflicts a different wound upon the tree. They do not injure the outward bark, and excepting occasionally by the worm casts or saw dust thrown out of their holes on the surface of the ground, there are no external marks of their being within the tree, until its unfruitfulness and decay prove that its deadliest enemy has attacked it. The method of discovering if the *borers* have commenced their ravages, is to dig round the tree to the depth of three inches, and if after cutting the outer bark, the inward bark be decayed, it is certain that the insect is within, and that unless it be taken out, the tree will certainly die. Mr. Hersey was in one season employed to examine upwards of four thousand trees, and in most of them he found from two to thirty *borers*. He saved many valuable fruit and mountain ash trees from being ruined by this worm.

Report of a Committee to whom was referred the application of Mr. E. Hersey.

The committee appointed by the trustees of the Massachusetts agricultural society, to inquire into the facts relative to the destruction of the worm called the borer, which has of late years been so injurious to the apple trees in this neighbourhood ; and to ascertain whether any thing be due to the exertions and adroitness of Mr. Ebenezer Hersey, of Roxbury, housewright, and generally known as a successful *grafter*, in destroying this troublesome and voracious insect, beg leave to report :—That they find, although it be uncertain whether Mr. Hersey was the first person who discovered the easy mode now practised by him, in taking the insect from the body of the tree, yet they are satisfied that the great advantage which

the publick are like to derive from the extirpation of this worm, is principally owing to the exertions and cleverness of Mr. Hersey in this branch of his profession ; and they recommend that a premium be awarded him of twenty-five dollars.

Your committee feel it incumbent on them to state, for your information, that Mr. Hersey has extirpated the insect in at least a thousand apple trees on *one* farm in Roxbury ; that he has probably saved many thousands in other parts of that town, and its neighbourhood, either by his personal attendance and labour, or by the information which he has given to others on the subject ; that he has restored to vigour and soundness many valuable peach trees that were gummy, and rapidly declining, from the effects produced by this, or a similar worm ; that he has traced them to the mountain ash, and saved many of those beautiful trees from perishing : and your committee have no doubt, if, from his example, the farmers of this commonwealth will examine their orchards, and cut out those insects from their trees, wherever found, they will, in a short time, feel the benefit of their attention, in the increased and improved quality of their fruit.

Your committee feel it their duty also to add, that from their own experience, they feel assured, that all those who can command the services of Mr. Hersey, will find it more economical to employ him to perform this work, than to undertake it themselves ; as his experience and original profession of housewright, acquainted with the use of tools, enables him to do it not only more thoroughly, but very much quicker than any one can who has not been in the practice of the art.

The seasons when this operation is performed with most effect, are the spring and fall ; and if in the spring, before the month of June, as the perfect in-

sects escape before that time. In apple and mountain ash trees, the existence of the animal in the tree may generally be known, by the mossy appearance on the bark; and it may be traced by removing a little earth from the body of the tree, next above the insertion of the great roots. Although the hole at which the insect enters, is, in many instances, very small, yet it is easily discovered by an appearance of powdered wood, or fine saw dust, which is thrown out by the worm;—here you may introduce your chisel, and follow his track. Cut the bark smooth, and when you have cleansed the tree of all the insects, (of which there are sometimes as many as twenty to be found,) plaster the wounds over with a little clay, and when it is dry, restore the earth to its place. The operation should be renewed the succeeding season, to make the work complete. In peach trees the insect is traced by the gum; but as this is also produced by bruises, it is not infallible.

SAMUEL G. PERKINS, }
JOHN PRINCE, } Committee.

Note.—If the frost be out of the ground, we recommend to farmers to perform the spring cleansing as early as March and April.

Boston, April 16.

Having so happily discovered a method of destroying this pernicious reptile, it still remains extremely desirable to devise some means by which its successful attack upon the tree may be prevented. We are unacquainted with the natural history of this worm, but it is highly probable that it is the progeny of the fly which deposits its eggs in the bark of the peach tree. Whether this be the fact, or whether it derive its existence from some source in the earth, it is reasonable, from its habit, to suppose that the soil or mould is congenial to its nature, and that native in-

instinct directs it to enter the tree, for its future residence and support. The most obvious mode of prevention, therefore, which reflection has suggested, is the following. Early in the spring, let the soil from around the trunk of the tree be removed, down to the roots, and fill up the vacant place with some substance that would prove obnoxious to the fly or worm, or that would infallibly resist its powers to penetrate the bark. Among the substances which appear most likely to prove successful, I will mention the flax rubbish and sea-weed, page 61 of this volume. The next which occur, are ashes, lime, sea-shells, sea-sand, mortar-rubbish from old buildings, clay, tanner's bark, fragments of leather from the tanner's and shoemaker's shops, &c. Some, or perhaps any of the above-mentioned substances, if pressed closely round the trunk of the tree, must inevitably prevent the fly or worm from having access to the bark, and of course prove an effectual remedy. Should it be the case, that the worm advances from some distant part in search of the tree, it is possible, on meeting foreign substances, to which it has not been habituated, its instinctive faculties may be baffled, or it may die before it can effect its object. Besides the expedient just described, another remains to be mentioned; it is the application of the clay paint, page 79, or the following composition, which is preferable. Take equal parts of quick lime, cow dung and clay, which by the addition of soap suds and urine, should be reduced to the consistence of common paint. To make it more adhesive, add a little hair. Let the whole stem, from the roots to the branches, be enveloped with a coating of this composition, and occasionally repeated, and it will scarcely be possible for the fly or worm, or insects, to injure the trunk of the tree; and it will at the same time prove conducive to its health and vigour. It might even be recommended

to make this application to all young trees, at the time of transplanting, especially in places where the worm is known to prevail.

It appears that this destructive worm is rapidly extending its ravages among our orchard trees. In attending to the examination of my own trees since writing the above, (September 4th,) I was astonished to find that more than half of them were suffering injury by the borer, in considerable numbers, fifteen being taken out of a single tree; I was struck with the remark of the workman, that those trees which were surrounded by a cluster of root suckers, were in particular the greatest sufferers; and when the tree had suckers on one side only, the worms were found on that side of the tree. It is not improbable that the suckers and leaves facilitate the operation of depositing the eggs by affording a convenient shelter for the fly or moth; but we are destitute of the natural history of this insect. The suckers and worms all being removed, I directed the wounds made in the trees, and also the whole trunk near the surface of the earth, to be covered with a mixture of clay and cow dung, with a little hair to render it more adhesive; and afterwards a circuit of about three feet round each tree, to be covered with tanner's bark, or seaweed. It is now known that the ravages of the borer are not confined to the root of fruit trees, but are found in the whole extent of the trunk, and even to the larger branches; and that in some local situations, instead of abandoning the trees in June, they continue to perforate the bark and prey upon the wood the most of the summer. It seems requisite, therefore, to guard diligently against this insidious enemy during the whole season.

SLUG WORM, OR NAKED SNAIL.

It is from the accurate observation of professor Peck, that we are enabled to present the reader with the history of the slug worm, by which, of late years, our fruit trees have been infested. These reptiles make their appearance upon the leaves of fruit trees, in the month of July, and our ingenious professor has discovered, that they are the progeny of a small black fly, which deposits its eggs in the leaf in the months of May and June, and in fourteen days after the deposit, the perfect slug is found adhering and feeding on the leaves. It is of an olive colour, with a slimy coat, and in the course of twenty days, it throws off four skins, at nearly equal periods; it remains in the fifth, or last viscous skin, six days, and acquires its full growth; it then quits this fifth skin, which is left adhering to the leaf, and appears in a clean yellow one, entirely free from viscosity, and has so different an aspect that it would not be supposed to be the same larvæ. After resting some hours, it proceeds slowly down the tree to the earth, into which it enters to the depth of from one to four inches; and in about eighteen days they again ascend from the earth, in the form of flies, and these again deposit their eggs in the leaf; so that they produce two hatchings in a year.

It is happy for the fruit planter that a simple method is discovered, by which these destructive insects may be effectually destroyed. This is done by means of lime sprinkled over the leaves in the form of powder. For this purpose, a wooden box, of convenient size, having its bottom perforated with numerous small holes, is to be filled with lime. This being mounted on a pole, by shaking over the tree, distributes the lime among the leaves, and the slugs are immediately destroyed. The labour is very triv-

ial; a man may cover a large tree in three or four minutes; and the desired effect is certain. Fine earth shaken through a basket or perforated box, will answer equally well.

Another remedy, it is said, will prove equally effectual. It is a strong infusion of tar, made by pouring water on tar, and suffering it to stand two or three days, when it becomes strongly impregnated. This, if sprinkled over the leaves by means of an engine, will kill these vermin instantaneously. A strong decoction of tobacco will probably produce the desired effect, and tanner's bark put round the tree, it is said, will have a salutary tendency as a preventive.

The following letter from E. Perley, esquire, is extracted from the Massachusetts Agricultural Repository, vol. 3, page 144.

LICE, INFESTING YOUNG ORCHARDS, IN THE DISTRICT OF MAINE—MODE OF DESTROYING THEM.

“This insect, called *lice*, is in form like half a kernel of rye, (but not more than one twentieth part so large,) with the flat side sticking to the smooth bark of the tree. They resemble blisters; and are near the colour of the bark of the tree. These blisters contain from ten to thirty nits or eggs each, in form like a snake's egg; which, in a common season, begin to hatch about the 25th of May, and finish about the 10th of June. These nits produce a white animalcule, resembling a louse, so small they are hardly perceptible by the naked eye; which, immediately after they are hatched, open the passage at the *end* of the blister, and crawl out on the bark of the tree; and there remain, with but little motion about ten days; when they stick themselves fast to the bark of the tree, and die. From this little carcass arises a small speck of *blue mould*, which is most plain to be seen

between the 10th and 20th of June, and continues about fifteen days; and then gradually wears off, until the old carcass appears, which by this time is formed into a new blister, and contains the spawns or nits before mentioned.

“These blisters prevent the circulation of sap, and prove as fatal to the tree as the canker worm.

“In order to remedy the difficulty, I have made many experiments within a few years; but long to no good effect, not knowing then the particular season when these animalcules could be most easily destroyed. This, however, I have lately found to be between the time they hatch, and that when the mould leaves them.* The application that I have found most effectual is, washing the trees with lie or brine. Lime, also, mixed with lie, to the consistence of white wash, may be useful. And although the *small* branches cannot be cleansed in this manner without much difficulty, still, if the body of the tree, and the branches near the body are kept clean until there comes a *rough* bark, I think the lice will not kill the tree.

“Some people have recommended the application of *train oil* to the tree, which, indeed, is a powerful antidote against lice, but being of a glutinous quality, is very detrimental to the tree. *Inoculation* has been proposed; which, I think, will have no effect at all on the lice; for I perceive they hatch in May, on branches that were pruned off the tree in March, and the sap entirely extinguished.

“These lice are natural in the *uncultivated* forest, on what is called moose-wood, and other bushes.

“Much care should be taken on their first appear-

*“It appears from this account, by Mr. Perley, that these appearances can, in general, only occur between May 25, and July 5.”

ing in an orchard or nursery; as the cutting down and destroying a few young trees is of no importance, compared with the difficulty of having an orchard overrun with them.

“P. S. The brine or pickle, with which the tree is to be washed, should not be such as has had meat salted in it; but let one quart of common salt be dissolved in two gallons of clean water.”

As a remedy against these lice, the *clay paint*, mentioned, page 79, may be recommended. If this were properly applied to the trunk and branches of the tree after the eggs are hatched, it would so completely envelop the insects as probably to counteract their mischievous effects. A pretty strong solution of potash would perhaps prove a very effectual remedy against lice, but on account of its caustic quality it must not be used too freely. A strong decoction of tobacco would probably prove a remedy.

CIRCULIO.

The following is extracted from the Domestic Encyclopedia, edited by Dr. Mease.

“The editor is indebted to his excellent friend, Dr. James Tilton, of Wilmington, Delaware, for the following original and very valuable communication, on the subject of the insect, which has been so actively engaged in destroying the fruit of Pennsylvania, Delaware, (and, probably, of the other states,) for a few years past. It were to be wished, that other gentlemen among us, who have opportunities, would be equally attentive with Dr. Tilton, in communicating their observations upon this subject of rural economy.

“Curculio, a genus of insects belonging to the *coleoptera*, or *beetle* order. The species are said to be very numerous. The immense damage done, by an

insect of this tribe, to the fruits of this country, of which there is no similar account in Europe, has given rise to a conjecture, with some naturalists, that we have a peculiar and very destructive species in America.*

“The manner in which this insect injures and destroys our fruits, is by its mode of propagation. Early in the spring, about the time when our fruit trees are in blossom, the *curculiones* ascend in swarms from the earth, crawl up the trees, and as the several fruits advance, they puncture the rind or skin with their pointed rostra, and deposit their embryos in the wounds thus inflicted. The maggot, thus buried in the fruit, preys upon its pulp and juices until, in most instances, the fruit perishes, falls to the ground, and the insect, escaping from so unsafe a residence, makes a sure retreat into the earth; where, like other beetles, it remains in the form of a grub or worm during the winter, ready to be metamorphosed into a bug or beetle as the spring advances. Thus every tree furnishes its own enemy; for although these bugs have manifestly the capacity of flying, they appear very reluctant in the use of their wings; and perhaps never employ them, but when necessity compels them to migrate. It is a fact, that two trees of the same kind may stand in the nearest possible neighbourhood, not to touch each other, the one have its fruit destroyed by the *curculio*, and the other be uninjured, merely from contingent circumstances, which prevent the insects from crawling up the one, while they are uninterrupted from climbing the other.

“The *curculio* delights most in the smooth skinned stoned fruits, such as nectarines, plums, apricots, &c.

*This is a bug about the size of that which is found in the pea in its dry state. No fruit should be suffered to rot under trees, as it is by this means that the *Curculio* is annually propagated.

when they abound on a farm : they nevertheless attack the rough skinned peach, the apple, pear, and quince. The instinctive sagacity of these creatures directs them especially to the fruits most adapted to their purpose. The stone fruits more certainly perish by the wounds made by these insects, so as to fall in due time to the ground, and afford an opportunity to the young maggot to hide itself in the earth. Although multitudes of such fruits fall, yet many recover from their wounds, which heal up, with deeply indented scars. This probably disconcerts the curculio, in its intended course to the earth. Be this as it may, certain it is, that pears are less liable to fall, and are less injured by this insect than apples. Nectarines, plums, &c. in most districts of our country, where the curculio has gained an establishment, are utterly destroyed, unless special means are employed for their preservation. Cherries escape better, on account of their rapid progress to maturity, and their abundant crops: the curculio can only puncture a small part of them, during the short time they hang upon the tree. These destructive insects continue their depredations from the first of May, until autumn. Our fruits, collectively estimated, must, therefore, be depreciated more than half their value.

“It is supposed the curculio is not only injurious above ground, but also in its retreat, below the surface of the earth, by preying on the roots of our fruit trees. We know that beetles have, in some instances, abounded in such a manner as to endanger whole forests. Our fruit trees often die from manifest injuries done to the roots by insects, and by no insect more probably than the curculio. In districts where this insect abounds, cherry trees and apple trees, which disconcert it most above, appear to be the special objects of its vengeance below the surface of the earth.

“These are serious evils ; to combat which, every

scientifick inquirer is loudly called upon to exert his talents; every industrious farmer to double his diligence; and all benevolent characters to contribute their mite.

“Naturalists have been accustomed to destroy vicious insects, by employing their natural enemies to devour them. We are unacquainted with any tribe of insects able to destroy the curculio. All the domestick animals, however, if well directed, contribute to this purpose. Hogs, in a special manner, are qualified for the work of extermination. This voracious animal, if suffered to go at large in orchards, and among fruit trees, devours all the fruit that falls, and among others, the curculiones, in a maggot state, which may be contained in them. Being thus generally destroyed in the embryo state, there will be few or no bugs to ascend from the earth in the spring, to injure the fruit. Many experienced farmers have noted the advantage of hogs running in orchards. Mr. Bordley, in his excellent ‘essays on husbandry,’ takes particular notice of the great advantage of hogs to orchards: and although he attributes the benefits derived from these animals to the excellence of their manure, and their occasional rooting about the trees, his mistake in this trivial circumstance does by no means invalidate the general remarks of this acute observer. The fact is, hogs render fruits of all kinds fair and unblemished, by destroying the curculio.

“The ordinary fowls of a farm-yard are great devourers of beetles. Poultry, in general, are regarded as carnivorous in summer, and therefore cooped some time before they are eaten. Every body knows with what avidity ducks seize on the tumble bug, (*scarabæus carnifex*.) and it is probable the curculio is regarded by all the fowls as an equally delicious morsel. Therefore it is, that the smooth stone fruits, particularly, succeed much better in lanes and yards, where the

poultry run without restraint, than in gardens and other enclosures, where the fowls are excluded.

“Even horned cattle, and all sorts of stock, may be made to contribute to the preservation of our valuable fruits. By running among the trees, they not only trample to death multitudes of these insects, but by hardening the ground, as in lanes, it becomes very unfit to receive or admit such tender maggots as crawl from the fallen fruits. Besides, the curculio is very timid, and when frightened by the cattle rubbing against the tree, or otherwise, their manner is to roll themselves up in a little ball, and fall to the ground, where they may be trampled and devoured by the stock, poultry, &c. Colonel T. Forest, of Germantown, having a fine plum tree near his pump, tied a rope from the tree to his pump handle, so that the tree was gently agitated every time there was occasion to pump water. The consequence was, that the fruit on this tree was preserved in the greatest perfection.”

To the foregoing valuable communication of Dr. Tilton, I will add a fact of which the Doctor was probably unapprised. Instead of retreating into the earth, a part of the worms at least, abandon the apple before it falls from the tree, and locate themselves under the scales of the bark, and in the crevices of trees. In making search this day, 25th September, I have detected a considerable number of apple-worms in that condition, entirely secure from the weather. This circumstance will shew the great utility of proper applications to the trees, both in the fall and spring, for the destruction of insects. All the rough bark should be carefully removed, and the trunk and large branches should be thoroughly washed with Forsyth's composition, page 78, or a strong decoction of tobacco with the addition of a small quantity of quick lime, which should be applied to every crevice which can afford shelter for insects or their eggs.

GATHERING AND PRESERVING APPLES.

The fruit orchard having attained to that productive state, in which the proprietor is about to remunerate himself for his labour and attention, it is still requisite to exercise due judgment and discretion in the grateful employment of collecting his crop. The injudicious method commonly practised in gathering apples is more destructive in its consequences than is generally understood. The first requisite is, to ascertain precisely when the fruit is fully ripe, as it is said, that the longer winter apples are suffered to remain on the trees, provided they are not overtaken by frost, the longer they may be preserved. In hot climates, and in hot seasons, fruit attains to maturity and ripeness earlier than in colder ones, because the sap performs its office more rapidly. It may be considered a correct rule, that apples are ripe when those that are sound and fair fall naturally from the trees, or separate very readily on being lifted by the hand. They should be gathered during a clear dry air, after the dew has evaporated. According to the late philosophick Dr. Darwin, in order to ascertain when fruits, for instance, apples and pears, are sufficiently ripe for gathering, it is requisite to attend to the colour of the skin enclosing the seeds. During their infant state, there is no cavity round the kernels, but they are in contact with the seed vessels. In a subsequent period, when the fruit has exhausted the nutritious matter, the cells containing the seeds become hollow, and the latter assume a dark colour. This, Dr. D. observes, is the proper criterion by which to judge when such fruits should be gathered; as it indicates that they will not continue to increase in size, but waste and become hollow, by absorbing the mucilaginous particles from the centre. In gathering apples and pears, it is necessary carefully to avoid injuring

the blossom buds, which are already formed for the next year's fruit. These buds are placed at the side of the foot stalk of the fruit, and if the spurs are broken, there will be no fruit on that part the next season. The pressing against the trees, therefore, with heavy ladders, and the rash practice of thrashing the limbs with poles, ought to be entirely abandoned; for by such means, the bark and limbs are bruised, and the blossom buds for the succeeding year are destroyed. Instead of ladders, stepping frames should be employed, and a pole, furnished with a hook at the end, and covered with coarse cloth, may be used to shake the small limbs, without injuring the bark. When perfectly ripe, apples for cider may be shaken off without injury to the buds, but still they will be bruised, unless the ground be covered with blankets or straw. Particular care is requisite in gathering winter fruit for keeping: they should be gathered by the hand, and without injury, removing them from the gathering basket to the casks prepared for them, with great care: if bruised, they soon decay; and the less those that are sound are moved, the better. When in barrels, they should be placed in a dry, cool, shaded situation, above ground, and remain until endangered by frost, and then put into the cellar.

The following valuable observations, contained in a letter from N. Webster, esquire, have been published in the Massachusetts Agricultural Repository, from the Connecticut Courant.

PRESERVATION OF APPLES.

"It is the practice with some persons, to pick them in October, and first spread on them on the floor of an upper room. This practice is said to render apples more durable, by drying them. But I can affirm this to be a mistake. Apples, if remaining on the

trees as long as safety from the frost will admit, should be taken directly from the trees to close casks, and kept dry and cool as possible. If suffered to lie on a floor for weeks, they wither and lose their flavour, without acquiring any additional durability. The best mode of preserving apples for spring use, I have found to be, the putting them in dry sand as soon as picked. For this purpose, I dry sand in the heat of summer, and late in October put down the apples in layers, with a covering of sand upon each layer. The singular advantages of this mode of treatment are these: 1st. The sand keeps the apples from the air, which is essential to their preservation. 2dly. The sand checks the evaporation or perspiration of the apples, thus preserving in them their full flavour—at the same time, any moisture yielded by the apples, (and some there will be,) is absorbed by the sand; so that the apples are kept dry, and ail mustiness is prevented. My pippins, in May and June, are as fresh as when first picked; even the ends of the stems look as if just separated from the twig.”

An English writer recommends the use of dry pit sand, for the preservation of apples and pears. Glazed earthen jars are to be provided, and the sand is to be thoroughly dried. A layer of sand, an inch thick, is then to be placed in the bottom of the jar; above this, a layer of fruit, to be covered with a layer of sand, an inch thick; then lay a second stratum of fruit, covering again with an inch of sand. An inch and a half of sand may be placed over the uppermost row of fruit. The jar is now to be closed, and placed in a dry, airy situation, as cool as possible, but entirely free from frost. Wheat bran is sometimes substituted for sand.

“One of the most easy methods,” says Dr. Darwin, “of preserving fruit is, that of depositing it in ice-houses, where it may remain in a frozen state for a con-

siderable time. And if the fruit be afterwards gradually thawed, by covering it with melted ice, or immersing it in cold spring water, it will lose but little of its flavour, provided it be consumed on the same day."

Mr. Forsyth gives the following directions for picking and preserving fruit. "All apples, pears, &c. ought to be carefully picked by hand, and laid in baskets containing dried grass, to prevent them from being bruised; and if they fall spontaneously, some dry barley straw, or pease haulm should be prepared for their reception on the ground; in the latter instance, the fruit ought to be separated from, and sent to table before that which is collected by hand; and such as may be accidentally bruised ought to be reserved for culinary purposes, because it cannot be long kept in a sound state. When all the fruit is collected, it should be conveyed to the store room, laid gently, in small heaps, on dried grass, and their tops be covered with short grass, in order to *sweat*. Here it may remain for about a fortnight, during which time, each apple, pear, &c. must be occasionally wiped with a dry woollen cloth, and those exposed on the surface should be placed towards the middle of the heap. At the end of this period, all watery ingredients that may have been imbibed during a wet season, will be evaporated; the heaps should then be uncovered, and each article carefully wiped; separating those which may be injured, or unfit for keeping. During this process of sweating, the windows of the store room, excepting in wet or foggy weather, ought to be continually open, in order to discharge the moisture perspiring from the fruit. Mr. Forsyth then directs, as the best method of preserving fruit, to pack them in glazed earthen jars, each apple and pear to be wrapped separately in soft papers, &c. Few persons will be disposed to subject themselves to such expense and trouble, by adopt-

ing the directions of Mr. F. I should prefer the following mode : take a quantity of clay, let it be thoroughly dried in the sun, and reduced to fine powder ; and while packing apples in dry casks, instead of sand, let each layer be covered with the clay powder. This will secure them from the air, absorb the moisture that exudes, keep the fruit cool and dry, and preserve their flavour. The fruit thus packed may be removed immediately from the tree into the cellar. It is a good practice adopted by some persons, to store their apples on long broad shelves erected against the walls of a cellar secure from frost. These shelves may be constructed one tier above another, and the apples carried directly from the tree and spread so as to lay separately. This method has been found to answer every purpose ; the apples may be sorted occasionally with little trouble without bruising, and the expense will be less than if barrels are employed. A captain of a whale ship has just informed me that he has found the best method to preserve vegetables (potatoes and beets) on a long voyage, is to pack them in lime casks and to sift some air slacked lime over them ; this absorbs the moisture, secures them from the effects of heat, and prevents in a great measure, potatoes from sprouting. By this method he has preserved potatoes over a year in a better condition than by any other. He is of opinion that this would be an eligible method for preserving apples and pears, and I have resolved this season to test the experiment accordingly.

LIST OF APPLES

HELD IN MOST ESTIMATION IN THE UNITED STATES.

An accurate technical list of the various sorts of apples known in the United States, would be considered an acquisition of importance; but their names are derived from such various and capricious causes or incidents, that a correct list cannot be easily accomplished; some have received names descriptive of the fruit, and others are derived from the places where they have been first found, or from the original cultivator. But a serious misfortune is, in several instances the same fruit bears many different names in different places; which subjects the planter to much inconvenience, as it not unfrequently happens, that grafts of a supposed new variety are obtained from a distance, under a different name, which eventually prove to produce the same kind of fruit, with which his orchard already abounds. It is very desirable that fruit should be known by the same name in all places; with this view it will be useful when writing or speaking of any fruit, to give an accurate description of it and its qualities, with the tree by which it is produced. By such means, different varieties may be identified, and in due time a catalogue may be formed, much to the convenience and satisfaction of every cultivator. William Coxe, esquire, of Burlington, New-Jersey, possesses the most extensive orchard and cider establishment, it is presumed, in the United States, consisting of more than four thousand apple trees, besides other fruit. This gentleman has favoured the publick with a view of the cultivation of fruit trees, &c. which contains a descriptive list of one hundred and thirty-three varieties of apples, which are

cultivated on his own plantation. To this list may be added others, in various parts of the union, amounting, probably, to several hundreds. The following is from Dr. Mease's edition *Domestick Encyclopedia*: "The family of Prince, at Flushing, Long-Island, have been many years celebrated for their fine fruit, and some of the choicest kinds to be met with, in various parts of the United States, have been brought from their nursery. A very extensive and excellent collection of fruits, both imported and native, were originally commenced about ten years since, by William Coxe, esquire, of Burlington, New-Jersey, and is now for sale by I. Smith & Co. at that place. In this grand collection, there are eighty kinds of apples, (now one hundred and thirty three,) ninety kinds of pears, and fifty-one of cherries, nearly all imported, and one hundred varieties of peaches. Mr. Samuel Coles, of Moor's town, New-Jersey, has also an excellent collection. Several French gentlemen, who have taken up their residence near Philadelphia, have done much in a few years towards improving our stock of fruits, by importing largely of the finest kinds from France; and there can be no doubt, if we take pains to propagate from the valuable stock in our power, that in a few years, the neighbourhood of Philadelphia may boast of as fine a collection as can be desired.

"Under the article apple, some important remarks were given on this subject; the editor has now great pleasure in presenting to the American publick the first attempt ever made to collect, in one view, a list of the finest kinds of apples growing in the United States. For the materials, of which this list was composed, he has been indebted to Mr. William Prince, of Long-Island, Mr. R. Riley, of Marcus Hook, Chester county, William Coxe, esquire, of Burlington, and the honourable Judge Boudinot, of Newark, New-Jersey; through whom, also, the valuable facts from Mr.

John Ogden, of Newark, and from Mr. Asa Hillyes, of Orange, Essex county, New-Jersey, were obtained; and he, with thanks, expresses his obligations to them for their ready assistance and communication. Attentive, however, as his friends have been, he cannot suppose that the list comprehends every apple in the United States; but he is satisfied, that the most valuable have been described, and he will gladly receive accounts of any others, which may have been unnoticed, and add them to the list, should another edition of this work be called for."

John Kenrick, esquire, and sons, of Newton, near Brighton, have for several years been engaged in a nursery establishment consisting of a handsome collection of fruit and ornamental trees and shrubs. From their long experience they are enabled to conduct such an establishment with much advantage; and by the aid and encouragement of several gentlemen who are in the habit of importing horticultural productions from abroad, their nursery is continually increasing in variety and improving in character. They are particularly desirous to discard all such fruit as are known to have become deteriorated or subject to blast, and to cultivate such only as stand high in the opinion of connoisseurs as possessing superior qualities.

From the ample catalogues of Dr. Mease and William Coxe, esquire, and from other sources, I have selected a list of those which are held in most estimation, and such as are generally in demand at market.

Those marked c. are cider apples.

1. *American pippin*, c. "was brought from Maryland to Marcus Hook, thirty years since. It is of a flattish form, middle size, firm substance, resembling the vanderere, and will keep till harvest. Mr. Coxe describes it as a long fruit, having a dull red stripe. Fourteen bushels of these apples are required, at Marcus Hook, to make one barrel of cider." (Mease.)

2. *American nonpariel*, or doctor apple, in Pennsylvania. "Will keep from November to March. A large red-striped apple, of excellent flavour, and very juicy. It keeps tolerably well during winter. The tree is subject to blast."

3. *Autumn*, or *Fall pippin*. "Ripens in October. A large yellow apple, acid taste, and pleasant flavour. It is also a good kitchen apple. It usually weighs nineteen ounces. Keeps well."

4. *Aunt's apple*. "This is a beautiful and large apple, of an oblong make, resembling the Priestly in shape; the skin smooth, streaked with a lively red, on a yellow ground; the flesh is yellow, breaking and juicy; of an agreeable flavour, but not rich. It ripens in November, and, from its handsome appearance, is a valuable market fruit. The tree is small, the growth delicate, and its fruitfulness great. It is extensively cultivated in several of the eastern counties of Pennsylvania." (Coxe.)

5. *Baldwin apple*, or *Pecker apple*; is a very valuable red apple, large and beautiful, fine flavoured, and will keep till April. It is in high estimation in Massachusetts.

6. *Baltimore apple*. In the transactions of the horticultural society of London, published in 1817, it is stated, that a *large apple*, raised in the garden of Mr. Smith, near the city of Baltimore, was exhibited; it had been recently imported by captain George Hobson, of Baltimore, who sent it to sir Joseph Banks, by whom it was presented to the society. This apple, of which an engraving accompanies this account, weighed one pound seven and a half ounces; it measured in circumference one foot two inches and three quarters, and in height as it stood, was four inches, it proved very good, though over ripe; it was very close at the core, and, if a good bearer, will deserve general cultivation. The drawing is coloured, and very interesting.

Note by the editor of the *American Farmer*. "The apple here spoken of grew on the farm of Robert Smith, where, we are authorized to state, cuttings may be had for grafting."

7. *Black apple*. "Ripe in November; a very deep red. A much-admired fruit near Trenton, New Jersey. Mr. Boudinot, of New Jersey, says, "there is an apple lately discovered here, which is called by the owner of the orchard, a *black apple*. It appears to be a species between the Spitzenburgh and common black apple." (Mease.)

8. *Brownite*. In Mr. Riley's opinion, this is excelled by none for the table. It is ripe in September, and keeps well. It was discovered by Rowson, an old Swede, near Marcus Hook.

9. *Bow apple*. Ripens in June and July;—equal to any summer apple. It is juicy, tender, and mild; of a light yellow colour.

10. *Bell flower*. "A long yellow apple, of good flavour, very large, and excellent for the table, and for cooking. When fully ripe, which is in October, the seeds may be heard to rattle, when shaken. This beautiful apple will keep well through the winter; and it is held in great estimation in the Philadelphia market."

11. *Bullock's pippin*, or *sheep's snout*. This is a native of New Jersey, and is sometimes called the *long tom*. It is in high repute, in autumn and the first part of winter, for its rich and sprightly juice, and is much admired when baked.

12. *Campfield*, or *Newark sweeting*, c. "Is a large sweet fruit, of a pale red colour; ripens about the beginning of October, and keeps well, if carefully picked. Being a rich fruit, it is necessary to mix the Harrison apple with it in order to refine the cider produced from it."

13. *Cat-head*. "This is a very large, round apple,

flattened at the ends, and deeply hollowed: the stalk is short and thick, so deeply sunk as to be almost imperceptible: the colour a greenish yellow, the flesh white: a good apple for cooking and drying, but apt to drop from the tree, from its great weight; and deficient in point of richness and flavour." (Coxe.)

14. *Catline*, c. A Delaware autumn cider fruit, and considered a pleasant eating apple, in its season. The tree is very productive, and an early bearer.

15. *Carthouse*, or *gilpin*, c. "This apple is said to have been brought from Virginia. It is highly esteemed for its excellence as a table apple, late in the spring, and as a good cider fruit. It is a most abundant bearer, and hangs on the tree very late in the season. The tree is hardy; of a handsome, open, spreading, and vigorous growth: the fruit is small; the colour a deep red, and sometimes a little streaked with yellow; the skin of a polished smoothness; the form inclining to oblong. The flesh is very firm, yellow, and rich; not fit for eating until mid-winter, when it becomes juicy, tender, and finely flavoured." (Coxe.)

16. *Cider apple*, c. "The apple propagated under this name is highly esteemed, as a most productive and excellent cider fruit, in the county of Bucks, and the contiguous parts of Pennsylvania. The size is middling; its appearance resembles the vandevere; the skin is smooth, a lively streaked red: it is a pleasant table fruit, but is chiefly used for cider. The tree is tall; the limbs shoot upward. It is sometimes loaded with fruit, beyond any other tree in our orchards; requiring great care to prevent the branches being destroyed by the weight of fruit. It ripens in October and November." (Coxe.)

17. *Codling*. The codling, called also the English codling, is a very fine fruit for pies and stewing, and is also a pleasant table apple. It grows very large and

fair ; the form is oblong, rather irregular ; the skin is a bright, though pale yellow, with a fine blush, frequently, towards the sun ; it is somewhat pointed towards the blossom end ; the stalk short ; the flesh white, tender and sprightly. The tree is uncommonly handsome, vigorous and fruitful ; bearing very young, and constantly ; the leaves are large ; it makes a fine appearance in an orchard. The fruit is fit for stewing from the first of August, but does not become fully ripe until the end of that month, and continues in season till late in October. It is one of the profitable apples for market ; ripening gradually, and being very free from rot." (Coxe.)

18. *Corlies sweet*, c. "This is a large, fair apple, rather long in shape, of a bright yellow colour, smooth skin, a faint blush, and a few small grey specks ; the stalk is short, and of a middling thickness ; the flesh is coarsely grained, white and sweet ; it ripens in September and October, but will keep later for cider, for which it is highly esteemed. The tree grows vigorously, with a deep green foliage, and round head : it is a great bearer. It was brought from East Jersey." (Coxe.)

19. *Cooper's russeting*, c. "Keeps from October to May. A natural fruit, produced on the farm of Joseph Cooper, of New Jersey, who believes it to be of Indian origin ; as the tree, from which he (when a young man) preserved a graft, was an old decayed tree, and the place on which it grew was originally the site of an Indian village. It is somewhat dry, but of a pleasant sweetish taste. This apple makes most excellent cider : it is also a good pie apple, and best when not pared. Pears, boiled in russeting cider, with about half sugar, make a good preserve. The trees bear abundantly every second year : the limbs spread horizontally, and are short. This excellent fruit, being justly esteemed, is much propagated by engrafting, in New Jersey." (Mease.)

20. *Flat sweeting*, or *hornet sweeting*, from the circumstance of its being a favourite of hornets, on account of its rich, sirupy juice. This is a flat apple, thin skin, and of a yellowish colour; flesh white, and juice saccharine and pleasant. Ripe in September, and will keep several months. It is doubtful whether this fruit is known out of the county of Plymouth. Its origin not ascertained.

21. *Gloucester white*, c. "The apple is of a middling size; of a shape not very uniform, varying from an oblong to a flat form; the colour, when ripe, is a bright yellow; rich, breaking and juicy; of a fine flavour, as a table apple; and producing cider of an exquisite taste. The stalk is of the ordinary length, inserted in a cavity of medium depth; the crown is moderately deep; the time of ripening is about the first of October, after which the fruit soon falls, and is fit for cider: it does not keep long, but while in season, is a delicious table apple. The tree is very thrifty, hardy and vigorous; of a regular and beautiful form, and very productive. It is much cultivated in the lower counties of Virginia; from whence I procured it, as an apple of high reputation." (Coxe.)

22. *Golden pippin*. "Keeps from October to January; slightly acid; yellow on one side, and red on the other: it is a good apple, according to Mr. Riley, and was brought from England by William Penn. It succeeds best on a sandy soil."

23. *Golden rennet*. "A beautiful and excellent apple, of a bright yellow tint, marked on the south side with faint red streaks, and yellow brown dots; its flesh is remarkably tender, and of a glossy white; the juice has the taste and flavour peculiar to pine apples, and which is also found in the golden pippin: when stored, it ripens in December, but attains to perfection only in February. The tree has a healthy appearance, and is of a middling size."

24. *Green everlasting*. "Light green colour; skin remarkably smooth and fair. This apple keeps well until late in the summer, and some have kept perfectly sound more than a year from the time they were gathered." (Mease.)

25. *Green Newton pippin, c.* "It is of a flattish form, and green colour, when first gathered, turning yellow in the spring, and is justly esteemed the best table apple in America. It is supposed to have come originally from Holland, but Mr. Prince says, it originated in the town of Newton, Queen's county, Long Island, state of New-York. In general, apples, kept till the spring, lose their flavour, and become mealy, but the Newton pippin may be kept till June, without losing either its juice or flavour. It is an excellent apple for cider, either alone or mixed with others. Many varieties are raised from the seed of it, of a large size, but different in form and colour. Mr. Riley, of Marcus Hook, says, there are two varieties raised at Newton, in Chester county. The flat sort is much the best, and the greatest bearer. It is an excellent apple for house use; makes a large quantity of cider, though of a thin quality. A large long kind, sometimes called lady-finger, is not so good; the taste is not so pleasant, and they have a thick skin. This apple is of a beautiful golden colour in the spring. The trees of both those varieties grow larger, and are great bearers. Forsyth remarks, that the Newton pippin seldom ripens in England. Mr. Cooper, of New Jersey, remarks, that the Newton pippin does not thrive in a sandy soil." (Mease.)

26. *Grey house, c.* "Mr. Riley, of Marcus Hook, thinks this is not excelled by any for making cider: it is of a middling size, reddish grey colour, ripe in October. Cider is made of it in November. The tree bears but every other year, and then is heavily loaded. It is a very tender fruit, though late in blos-

soming. At the time of the formation of this fruit, it is very subject to perish by easterly winds, attended by cold rains, which frequently cause the apples to fall off in abundance, sometimes to the loss of the whole crop ; and, on an average, the tree does not succeed in bearing a good crop above one fourth of the time. It was first discovered by P. Roman, in his township, (Marcus Hook,) by a natural tree, that grew close to his house ; hence called his *house tree*, and by some, Roman knights. This tree is of a middling size, inclines to grow low, and is short lived. Twelve bushels of these apples are required to make a barrel of cider." (Mease.)

27. *Hagloe crab*, c. "According to Mr. Marshall, a gentleman in Herefordshire, England, Mr. Bellamy, produces cider from the Hagloe crab, which, for richness, flavour, and price on the spot, exceeds, perhaps, every other fruit liquor, which nature or art have produced. He has been offered sixty guineas for a hogshead, containing one hundred and ten gallons of this liquor." William Coxe, esquire, of Burlington, New-Jersey, having cultivated this fruit, describes it as follows : "The fruit, when fully ripe, has a yellow ground, streaked with bright red ; the size about middling ; the form round, flat at the ends ; the stalk large ; the flesh remarkably soft and woolly, but not dry ; the taste acid, but highly flavoured ; the quantity of juice smaller, in proportion to the fibrous matter, than in most other apples, requiring nearly one third more of the hagloes for a barrel of cider, than of common fruit ; the juice, though uncommonly clear, is singularly rich ; and though the smell of the apple is faint, the flavour of the cider is high, and, when properly manufactured, is very rich. The colour of the flesh is pale, but that of the cider, dark ; it ripens in August and September ; keeps a long time without rotting ; it bears abundantly and early ; the growth of

the tree is very uncommon; thick strong shoots; buds, particularly at the extremity of the branches, very large; the colour of the wood dark; the size of the tree is small. The Hagloe is an uncommon fine cooking apple; and from its great beauty and large size, added to its abundant bearing, is a valuable market fruit."

28. *Harrison apple*, or *long stem*, c. "It is of a moderate size, and of a rich dry taste, with a tartness, that renders its sweetness agreeable and lively. It ripens about the beginning of November; keeps a long time, and answers well for culinary purposes. The cider made from this apple is clear, high coloured, rich, and lively. General Washington was presented with a barrel of it, by judge Boudinot, of Newark, New-Jersey, and he declared his preference of it to that made from Hughes's Virginia crab. This fruit originated in Essex county, New-Jersey, where it is now very extensively cultivated. The cider from this fruit sells from eight to ten dollars per barrel. Mr. Coxe observes, "as a more vinous, rich, and highly flavoured liquor, I prefer the Harrison to the crab cider." (Mease.) "One tree of this kind, this year, (1817,) in an orchard in Essex county," says Mr. Coxe, "produced upwards of one hundred bushels, eighty-seven of which were gathered, when fully ripe; the others were fallen fruit, carefully measured, to ascertain the quantity."

29. *Harty sweeting*, c. A small yellow apple; ripens in autumn, and is considered a valuable cider apple, but not very useful for other purposes.

30. *High-top sweeting*. This tree, it is believed, is peculiar to the old Plymouth colony. The first settlers, either from choice, or for want of other varieties, cultivated it more generally than any other apple. It is now much on the decline. The fruit is under the middle size; of a yellowish colour, pleas-

ant taste ; but chiefly used for baking, and for drying. It is ripe in August, and is not long preserved. The tree is remarkable for its long upright stem.

31. *Holmes apple*, c. Was first planted by J. Holmes, esquire, of Kingston, Plymouth county. He set in the ground a small sprout, without knowing its qualities, and in the eleventh year he gathered from it thirty bushels of apples. It is now much admired, and extensively cultivated, in this vicinity. The tree bears young, and every year ; the more abundantly every second year. The fruit is of a middling size ; the skin white, with a blush on the sun side. Ripe in November ; keeps through the winter ; has a pleasant flavour, and makes good cider.

32. *Holten sweeting*, c. It is among the excellences of this tree, that it flourishes on a thin soil, and that it bears remarkably early, and very uniformly. Ripe in September, and is an excellent fall apple for family use, and for cider of the first quality. It is deserving of general cultivation. No account of its origin has been obtained.

33. *Hughes's Virginia crab*, c. "A small fruit, of a light green colour, striped with red, and of a harsh unpleasant taste. Originated in Virginia ; and is highly valued as a cider fruit, as its must is less disposed, from its great acidity, to rise too high in fermentation, than that of any other apple ; and it has, besides, almost every other property of a cider apple. The trees bear abundantly ; the fruit ripens late, and is free from rot of any kind ; the fruit is small and hard, and, therefore, bears the fall from the tree without bruising. It grinds small, and the pulp is remarkably tough, yet parts with its juice readily ; and the must runs from the press very fine and clear.

34. *Lady apple*. *Pomme d'Apis*. This is of French origin ; of a bright red colour next the sun, and yellow and green on the other side. A most beautiful

little apple, and of pleasant taste. It keeps well during the winter, and is a much admired dessert apple.

35. *Lady finger*. A long, tapering fruit, of a beautiful yellow and red colour. It is well flavoured, and keeps until June. The tree bears abundantly.

36. *Large red and green sweeting*. Ripens in September. A very large fruit, weighing a pound. Red, streaked on a yellow ground; the flesh sweet and tender.

37. *Large early harvest*. "Ripens in June and July. It is usually as large as a middle sized Newton pippin; of a pale yellow colour, when ripe; of a pleasant acid taste, and answers best for tarts, and may be used for that purpose, when no larger than a nutmeg; but cutting them in two equal parts, without peeling." (Mease.)

38. *Loring sweeting*. The apple, known by this name, was brought from the county of Bristol, by Mr. E. Loring, of Plympton, Plymouth county, and is much cultivated in this vicinity; its origin, or the name by which it is distinguished in other parts of the country, I have not been able to ascertain. The fruit is large and fair; of a pale yellow colour; the flesh is sweet, and extremely pleasant; abounding in a rich sirupy juice; and, as a baking apple, it is of superiour excellence. It ripens in autumn, and retains its good properties till March. This fruit ought to be introduced into every orchard.

39. *Large yellow Newark pippin*—*Yellow pippin*—*French pippin of Newark*, c. "Abounds near Newark, New Jersey; an excellent winter apple, of a greenish colour outside, rich saccharine taste, yellow substance, and of a higher flavour than the Newton pippin. It is so abundant in juice, that a barrel of cider has been made from seven bushels; but the cider is not of the first quality. It is said to have been imported from France." (Mease.)

40. *Maiden's blush*. "This is an apple of large size, and great beauty; exhibiting a lively contrast—a yellow ground, with a bright red cheek; whence it derives its name, given to it by Samuel Allison, esquire, late of Burlington, who first brought it into notice: the form is flat, the skin smooth, the flesh white, tender and sprightly; remarkably light, and fitted for drying, for which it is preferred to any apple of the season; the stalk is short, and grows in a deep hollow, as does the eye: the fruit ripens in August, and continues in perfection till the end of September; and is fit both for pies and the table. The tree is uncommonly handsome, as well as vigorous in its growth; forming a fine open and spreading head: it bears abundantly and constantly, and is a very popular apple in the Philadelphia market." (Coxe.)

41. *Michael Henry*. "A winter fruit; a long green apple, much admired for the table, in Monmouth county, New-Jersey. It is a sweet, juicy, sprightly and well flavoured apple."

42. *Monstrous pippin, or American gloria mundi*. "It originated on the farm of Mr. Crooks, near Red Hook, in New-York. It is of a yellow colour, when ripe, and resembles in flavour the fall pippin, or piplin. It will keep from November till March. The fruit of the original tree weighed twenty-seven ounces." (Mease.)

43. *Morgan apple*. "Ripe in October. So named by Samuel Coles, of Moorstown, New-Jersey; as it came from the late I. Morgan. A pleasant eating apple; will keep till May. A great bearer." (Mease.)

44. *Newark king apple*. "It is a very large red fruit; ripens in October, and when mellow, has a very pleasant taste, and is generally used as a winter apple about Newark, New-Jersey, though it does not keep so well as some others."

45. *Nonsuch*. This is a fine red apple, having an

agreeable flavour ; will keep sound till late in the spring, and is much esteemed in Massachusetts, for its good properties.

46. *Nursery apple.* "Is the size of the Harrison apple. When first ripe it is of a greenish colour, but in the latter part of the winter, it turns yellow. It is frequently kept until June and July, and has been kept sound until September. It originated in a nursery of Jos. Baldwin, at Cranetown, New-Jersey." (Mease.)

47. *Pearmain, c.* The winter pearmain is among the first cultivated apples by the fathers of the old Plymouth colony, and is, undoubtedly, of English descent. Many trees of this kind are now supposed to be more than one hundred years old, and grafted trees from them produce the genuine fruit in great perfection. The tree is tall and upright, forming a handsome regular top : it is hardy, and will flourish in a light soil. It is not an early bearer, but when attained to about twelve years, from having been grafted, it produces more abundantly and uniformly than any other kind within our knowledge. The fruit is scarcely excelled as a table apple, or for cookery ; and the cider made from it, is said to be inferiour to none. The apple is of a moderate size ; fair and smooth ; of a reddish colour, interspersed with green and yellow ; the flesh a rich yellow ; the flavour slightly aromattick, and agreeable. There are two or three varieties of this apple, but rather of an inferiour quality.

48. *Pennock's red winter.* A large, fair, pleasant, spicy, apple ; of an oval, and somewhat flat form ; of a reddish colour. It originally came from Jos. Pennock, of Springfield township, Delaware county. The tree grows large, and is very handsome ; a great bearer, and the fruit is in great repute in the Philadelphia market.

49. *Priestly*. "Keeps from December to April ; originally cultivated in Buck's county, Pennsylvania. A large, long, juicy fruit, and of a spicy flavour ; colour red. This tree grows very straight, and is of a handsome shape." (Mease.)

50. *Pove-shon*, c. "Is a small red apple ; ripe about the latter end of September ; of a pleasant flavour, and makes good early cider ; for which purpose it is generally used about Newark, New-Jersey." (Mease.)

51. *Pound apple*. "This is a large fair apple, very showy, the form is flat, the stalk short, and planted in an indented cavity : the skin is smooth, a pale yellow, inclining to a green, streaked with a lively red ; the flesh of a yellowish cast, mixed with a small portion of green ; juicy and sprightly ; well fitted for cooking ; it ripens in October, and keeps for several months : the tree is large, vigorous and spreading." (Coxe.)

52. *Quince apple*. "The tree is of large and vigorous growth, the size of the apple large, the shape flat, the skin when fully ripe is yellow, the flesh rich, yellow and juicy : in appearance, it somewhat resembles a large yellow Newton pippin. It came originally from the state of New-York. Ripens in November." (Coxe.)

53. *Queen apple*. (Summer queen.) "The summer queen is an apple of the finest quality, and its appearance is uncommonly beautiful. The size is large ; the skin has a fine, rich, yellow ground, mixed with red, handsomely striped and clouded, sometimes in a proportion greater than the yellow ; the blossom end is much pointed, and full of little furrows and protuberances ; the stalk is long, and planted in a deep cavity, with projections of the flesh around the stalk, like the Roman stem—the flesh is rich, yellow, and highly scented ; equally suited for eating and stewing. It is not fully ripe until the beginning of August, but can be used for stewing long before that time : the

tree is of a very luxuriant growth, with large leaves, and hanging boughs: it is a great and constant bearer: it is known by the name of sweets harvest, in many parts of New-Jersey." (Coxe.)

54. *Rariton sweeting*, c. "Rich flavour, egg-shaped, makes good cider, which keeps well: brought from Rariton, by Mr. Ogden's father. (Mease.)

55. *Red everlasting*. "Ripe in November. Its colour deep red, it is a small sized fruit, of tolerable flavour, and keeps well till June or July, but grows mealy and dry." (Mease.)

56. *Redling*. "Was brought about sixty years since from Pennsylvania to New-Jersey, by the mother of Mr. Jos. Cooper, who thinks it is the best keeping apple now known. The colour is of a light shining red, and of very pleasant smell and taste. They hang on well, being suspended at the end of a twig. It somewhat resembles the Priestly apple." (Mease.)

57. *Red streak*, c. "Originally from England—a winter fruit; keeps well, but shrinks; of a pleasant flavour, red with spots, and generally has a russet coloured teat on the lower side. The tree grows straight. When used for pies, they need not be pared. The cider from this apple is much admired." (Mease.)

58. *Rambo*. From Delaware—a fine apple of the size of the vandevere; same shape, and a highly valued fruit.

59. *Roane's white crab*, c. "This apple I procured from colonel John Roane, of Virginia: the original tree was discovered a wilding on his estate, in the year 1790. In growth it resembles the Hewes crab; the leaves being very delicate, the wood hard, and the size of the tree small: it is an early and great bearer every second year: the apple is very small, not larger than the Hewes crab; the form is round, the stalk thin, the skin yellow, with a small portion of russet about the stem, and spots of red scattered

over it: the flesh is rich, dry, and of a musky sweetness; rough to the taste, from its astringent and fibrous properties, and leaving the pomace undissolved, after pressing: the liquor is remarkably strong, of a sirupy consistence when first made, but becoming singularly bright by proper fermentation and racking. It will keep perfectly sweet, in casks well bunged, and placed in a cool cellar through our summer months: the fruit ripens in September and October, and may be kept without rotting, for late cider." (Coxe.)

60. *Rhode-Island greening*. This is a fine large fair fruit, of a green colour when first gathered, and turns yellow towards spring. The flesh is rich, juicy, tender and very yellow. It is a most excellent apple for the table, in the first part of winter, and will keep and retain its flavour till March. The tree grows rapidly, spreading its luxuriant branches very extensively, and inclining towards the earth. It is doubtful whether this is the same, or a different variety from the Jersey greening.

61. *Roman Stem*. "This apple was first propagated in the neighborhood of Burlington, New Jersey, where the original tree is now standing. It is an excellent early winter fruit, much admired for its tender, mild, juicy and agreeable properties: the size is small; the form round; the stalk of a singular appearance, from a fleshy protuberance of the neighbouring part, resembling an aquiline nose; whence the apple derives its name: the skin is rough; the colour yellow, with black clouds and spots: the tree is of handsome and vigorous growth, with long shoots, and great fruitfulness: it is in every respect deserving of extensive cultivation." (Coxe.)

62. *Royal pearmain, c.* "Is a fine large apple; rather flat in its form; of a rich russet colour, blended with red, faintly streaked, and dotted with spots of russet. The skin is rough, the flesh a rich yellow,

of a very sprightly taste, and firm in its texture: when first gathered, rather tart, but becomes both sweet and tender by keeping: it is a good table apple, and makes excellent cider: the size that of a vandevere: it ripens in October, and will keep till February and March: it is highly esteemed by the planters in Virginia, whence I procured it, from the neighbourhood of Richmond: the tree grows tall and straight, with a luxuriant foliage, and regular form, and is a most abundant and uniform bearer. This apple is known in Pennsylvania, and much cultivated, under the name of the Merrit's pearmain." (Coxe.)

63. *Royal russet, or leather coat.* "This is an apple of moderate size, and of a flat form: when ripe, the side next the sun is a rich red, intermixed with russet, with spots of white: the flesh is well flavoured, sprightly and tender; the stem short and thick, with small swellings in the surrounding parts: it is a fine cooking apple; keeps well; and bears abundantly. It was imported from England, where it is highly esteemed as a valuable winter apple." (Coxe.)

64. *Roxbury russeting, c.* This is one of the best known, and most valuable fruits in Massachusetts. The apple is rather flat, and the colour a yellowish russet: it is not fit to eat till February, and is very easily preserved till June, when its juice and flavour are peculiarly pleasant. The trees are the most constant to bear, and seldom bear so full as to break the limbs; and the fruit is excellent for cider; and for the table, late in the spring. But the trees require a moist situation, and are less likely to thrive well in a dry soil, than any other kind of apple. They require also more manuring and care than most others, or the fruit will be very ordinary.

65. *Ruckman's pearmain, or golden pearmain, c.* "Called in New York and East Jersey, the Ruckman's or Dutch pearmain; and in other places, the red rus-

set; is a most valuable apple for cider, and for family use: the size is middling; the form rather flat; the skin rough, with a large portion of bright russet, mingled with red, towards the sun, when fully ripe: the flesh is rich, tender, and rather dry: it is a great and uniform bearer: the tree grows luxuriantly, with strong shoots, and a close, compact head: the fruit ripens in November, and keeps well through the winter." (Coxe.)

66. *Seek no further.* "This apple is a native of one of the eastern states: it is a large fruit; of round, but oblong form; the skin smooth, of a yellowish green colour; the flesh yellow, juicy, rich and tender; an agreeable early winter apple. The tree bears well; the trunk straight and tall, shooting into branches upwards, in a handsome and regular form." (Coxe.) The *seek no further*, or by some called *signifinger*, is much cultivated at Raynham, county of Bristol, where it probably originated. From its high reputation, it is now extending, by engraftments, into various parts of Massachusetts.

67. *Spitszenburgh.* "Keeps from November to March. There are three sorts: the Esopus; Flushing; and the Newton. The first, of a light red colour, round form, pleasant flavour, and slightly acid. The second is generally larger, and of a deeper red colour, covered with small white specks; its form is flatter, and is of a more acid taste than the first. The third species resembles the second in taste and colour, but in form is much flatter. According to Mr. S. De Witt, surveyor general of New York, the Spitszenburgh was discovered as an accidental production, in the neighbourhood of the city of Albany, and in his opinion, may challenge the world to match it. The flavour he thinks superior to the Newton pippin. Mr. Cooper and Mr. Coles, of Moorstown, New Jersey, mentioned another kind, called the Cane Spits-

zenburgh, from a family of that name near Gloucester Point, New Jersey, and which they thought superior to the kinds mentioned above." (Mease.)

68. *Spice apple*. "Is a large autumn apple, of an aromattick flavour, very tender, and good for house use, but will not keep long. It appears to be peculiar to New Jersey."

69. *Styre, c.* This is the most celebrated and extensively cultivated cider apple in England; and is also a good eating apple. The size is above middling; the colour of a pale yellowish white; the flesh is firm, and when fully ripe, of a fine flavour: the cider, when produced from a light, rich soil, is rich, highly flavoured, and of a good body; its price in England is frequently fourfold of that of common sale cider: the fruit is pale-rinded, but produces a high-coloured liquor. The tree is of a singularly beautiful growth, remarkably besom-headed, throwing out numerous straight luxuriant shoots, growing upwards from the crown, in the form of a willow pollard, running much to wood, and, in deep soils, growing to a great size before it becomes fruitful. It suits sandy ground. By the end of September it is ripe in England; generally the middle of October, in common years, the time of gathering. By Mr. Knight's experiment, they must outweigh all others, except that of a new variety produced by mixing the Laltham green and Siberian crab. Marshall states, that nearly one third more of Styre apples is required to produce a barrel of cider, compared with common apples." (Coxe.)

70. *Summer pearmain*. "This is one of the finest fruits of the season—frequently preferred to a fine pear. The size is middling, the form oblong, uniformly regular—the ends both deeply indented, the colour in the shade is dull red, somewhat streaked, and faintly spotted—in the sun it is frequently of a lively red, blended with a rich yellow: the juice is abundant, un-

til too ripe—the flesh is singularly tender, it frequently cracks open on the tree, and bursts from its own weight in falling: it is equally adapted to the table and stewing, and is probably the most popular apple of the season, which commences with the first of August, and (it being very free from rotting) continues through that and the following month. The tree is of a moderate size, the head very round and close: it grows remarkably well on light and sandy soils.” (Coxe.)

71. *Swaar apple*. Keeps from November to March. A large, yellow, and greenish apple, of good flavour: much admired as being a winter table fruit, of superior excellence. The trees bear largely.

72. *Sweet greening*. A large, handsome apple, resembling in size and form, the Rhode Island greening. Ripens in autumn, and possesses the valuable property of retaining its soundness and flavour till the middle of June. It is an excellent apple for baking, and deserves to be more extensively cultivated. Its origin is uncertain, and it is doubtful whether this fruit is known out of the old Plymouth colony.

73. *Tolman sweeting*. I have not been able to trace to its origin this justly admired apple. In Dartmouth, county of Bristol, where it is best known, it is held in much estimation for family use during the autumn, and through the winter. The fruit is above the middle size, yellow, with a small bluish stripe on one side: it is juicy, and the flavour pleasant.

74. *Vandevere, c.* “Formerly called stalcubs. A well known and most excellent eating fruit; pleasant, and sprightly acid, joined with a sweetish taste, and much preferred for pies and sauces. Unfortunately the trees have greatly failed of late. On a rich heavy soil, they are subject to the bitter rot: on a light soil, not so much so. Mr. Riley, of Marcus Hook, says, this apple originally came from Wilmington Dela-

ware, and was called after a farmer who raised it.”
(Mease.)

75. *Vanwinkle*, or *granniwinkle*, c. “Is a large, red, and very sweet apple; rich taste, and fine flavour: ripe about the middle of October, when the fruit falls and decays so rapidly that it is difficult to preserve the apple till the proper time for making first rate cider. These apples answer best, when mixed with half of their quantity of the Harrison apple. Cider made from this apple alone, resembles unfermented metheglin, and must remain in the barrel until the next summer, when it will fine. The tree originated in the orchard of Thomas Williams, deceased, according to Mr. Hillyes, of Orange; but Mr. John Ogden, of Newark, says, he was told the first graft was taken from a tree belonging to an old lady, Mrs. Van Winkle Poveshon.” (Mease.)

76. *Wine apple*, c. “An uncommonly large, fair, handsome, red apple. The form is round; flat at the ends: the skin is a lively red, streaked and spotted with a small portion of yellow; the stalk end frequently of a russet colour; both ends deeply indented; the stalk very short: the taste is rich and pleasant; an admired table fruit, and excellent for cooking, as well as for cider: it ripens in October, and keeps well through the fall and winter. The tree is uncommonly large and handsome; the leaves small; it bears abundantly; from its spreading form it does not require much trimming: it is probably as saleable an apple as any sold in the Philadelphia market. In the state and county of Delaware, it is called the Hays winter: and in one place in New-Jersey, the fine winter, and large winter red. I have been informed, that the original cultivator of this apple made admirable cider, by throwing about one shovel full of sandy loam into a pressing, which had an effect in lessening the acidity, and made a clear, sweet liquor, by this novel mode of fining.” (Coxe.)

77. *Wine sap, c.* "An autumn fruit, of a deep red colour, and sweet but not sprightly taste; makes excellent cider, which is preferred by some to that of the red streak, cultivated by Samuel Coles, of Moors-town, New Jersey."

78. *Yellow sweeting, c.* "A large, yellow, sweet apple, will keep till harvest, makes good cider, and answers for family use. Mr. J. Ogden's father took the scion from an old tree of J. Johnston's, at Connecticut farms, fifty years ago." (Mease.)

Scions of the following new varieties have been received by John Lowell, esquire, from that eminent English horticulturalist, Mr. Knight :

Gilliflower apple. Form angular, flesh perfumed and remarkably yellow. It is in perfection in winter and spring. It would afford a most excellent cider.

Sweeney nonpareil apple. A very large variety of the nonpareil, very excellent when well ripened in a warm season. It is entirely new.



CIDER.

I HAVE now the satisfaction of presenting the most ample and approved rules and directions relative to the important art of manufacturing and preserving that valuable and salubrious beverage, the produce of our orchards. The importance of the subject will justify the extent and minuteness of detail which occupy the following pages, and it is hoped the reader will find them, in the perusal, interesting and profitable.

"The value of fruits, for the manufacture of cider, may be judged of from the specifick gravity of their expressed juices. The best cider and perry are made

from those apples and pears that afford the densest juices; and a comparison between different fruits may be made with tolerable accuracy, by plunging them together into a saturated solution of salt, or a strong solution of sugar: those that sink deepest, will afford the richest juice."

The first authority of which I avail myself, is to be found in papers on agriculture, by the Massachusetts society for promoting agriculture, vol. 1.

"OF MAKING AND MANAGING CIDER.

"From the apple, in our country, we obtain a beverage highly useful. The wines of other countries do not differ more in quality, than the cider of ours. And much of this difference arises from improper management, either in grinding the apples, or, what is more common, putting the must or juice into foul casks, and neglecting or mismanaging it while fermenting. Mr. Marshall asserts, that a gentleman in Herefordshire, (England,) Mr. Bellamy, produces cider from an apple called the Hagloe crab, which, for richness, flavour, and price on the spot, exceeds perhaps every other fruit liquor, which nature or art have produced. He has been offered sixty guineas for a hogshead of one hundred and ten gallons of this liquor. Thus we see how capable the fruit from the apple tree is of improvement. We are favoured with the observations of a gentleman residing near Philadelphia, on the making and fermenting cider, and his directions to preserve the casks that have been used for cider. He begins thus: "It would be to little purpose, at present, to say much on the kinds of fruit capable of yielding the best cider, yet it may be proper to mention those most common here, and give them a place according to their respective merits. The sweet russet, called the pair apple, is unquestionably

the richest fruit we have : the house apple stands second : they both yield very sweet must, and consequently, specifically heavier than that of any other apple. The Newton pippin yields its must free from the finer pomace, and, although not so rich, from that circumstance, ferments more moderately, and is soonest fine in the cask. The Spitszenburgh and pearmain I do not rank among the cider apples, because they seldom afford a must that will bear fermentation, except the season be *uncommonly dry*, or the trees *very old*. The largest and finest fruit grows on young trees, and in moist seasons, and these yield the greatest quantity of cider. Old trees and dry seasons afford a smaller fruit, highly flavoured, and less juicy. The vandevere is little better than good water cider. If it be fermented, it very soon becomes acid, and if not fermented, becomes ropy. The red streak, the cockagee, and the royal wilding, so famous in England and Ireland, are not known here, but the Virginia crab well enough supplies the place of them all. This apple deserves every possible attention, and its must is less disposed, from its great acidity, to rise too high in fermentation than that of any apple known here. Were there no other advantages, this simple one would render it exceedingly valuable to the common farmer, who will be hardly brought to pay attention to the nice operation of fermenting the sweeter fruits ; but it has almost every other good property of a cider apple. The trees bear abundantly, the fruit ripens late, and is free from rot of any kind ; the fruit is small and hard, and therefore bears the fall from the tree without bruising. It grinds small, and the pulp is remarkably tough, yet parts with its juice readily ; hence the must runs from the press very fine. It would be going beyond my present object, to say much more of this apple ; yet I cannot forbear observing, that being acid, it will bear to stand in the pomace longer than any sweeter apple.

This fact deserves more attention than is commonly given to it ; and if the time and occasion would admit, I should indulge myself in speaking largely on it."

"As the inquiry is how to make the *best cider*, there need not any thing be said of imperfect fruit, or that which falls from the tree early in the season, as they cannot be applied to this purpose ; the September gale beating down such great quantities of apples, tempts the farmer to use them with those that continued longer on the tree. But where this gale happens early, the effects are fatal to the cider : for, if they are made up immediately, the fermentation rises too high, in consequence of the too great degree of heat in the air ; and this evil is increased by the *imperfect* and *great* quantity of juice contained in the fruit ; if they remain unground, they become insipid, especially those which lay on the ground under the trees ; and if gathered in heaps, they are disposed to rot. To make the best cider, you must have sound fruit, gathered late in the season, in dry weather, after the middle of October, if possible. They should lay in large heaps, covered with the dews and rain, about fourteen days ; in which they heat, and throw off a great proportion of their indigested and insipid water, and ripen more uniformly than while on the tree. They must not be ground while they are wet, either from the rain, the dew, or from the moisture thrown out by the heat produced by their laying together. The finer the apple is ground, the more it will yield. If the mill is well fitted, it crushes the seed, and gives a peculiar aromatic bitter to the must, which becomes more and more distinguishable as the cider is longer kept. Some prefer this flavour, and others dislike it, not distinguishing it from the bitter of the rotten apples, although very different from that pungent bitter, both in taste on the palate, and effects in the stomach. If straw is used in forming the cheese for the press (cloth made of

hair is best, but very expensive) it must be clean from *rust*; for there is no liquor which more readily imbibes and betrays offensive taste than cider. Too hard pressing on the cheese, before it is sufficiently closed, presses out the pulp with the must, and it is in all cases necessary to return the first running on to the cheese, until you you perceive it free from pulp. If you choose a pale cider, the pomace must be pressed as soon as possible from the mill: the colour is raised by exposing it longer, and in greater surfaces to the air. The aptness in cider to imbibe foreign tastes, renders an exact attention to your vessels of great importance. New vessels, made of seasoned oak, do very well; but those that have been used are better, provided they be kept *sweet* and clean. The must, or juice of the apple being obtained, the first object is to clear it of pumice: the second, to produce a fermentation to your palate and purpose.

“The most expeditious mode of doing the first in the great way, is by putting the must in large open vessels, there to stand until the first appearance of fermentation.* This comes on sooner or later, from circumstances too various for our present consideration at large. It may serve the purpose to consider the operation, as dependent on the degree of heat in the air at the time: perhaps sixty hours is long enough to be wished for. During that time the *heaviest* of the pulp sinks to the bottom; the larger and lighter parts rise to the surface, where it remains until the fermentation begins; but the fermentation would involve a great part of the pulp, both from above and below, into the body of the liquor, and in-

*Hogsheads, or even barrels, answer very well with a head out, where there are plenty of casks; but it is as well done in the casks you intend to ferment in, provided you attend to the first appearance of fermentation at the bung-hole, and remove the pulp entirely out of the cask.

crease the fermentation beyond our control. It must therefore be removed before this effect be produced. Soon after the fermentation begins, the covering on the top of the *must* cracks and separates, when there is not a moment to be lost before you draw it into your casks, leaving the pulp behind. In this cask it undergoes the first of the fermentation for eight or ten days ; but before this *most difficult part* of the art of making the *best cider* can be well understood, there are so many points to be considered of, that I have always hesitated to give my opinion of it, from a certainty that the subject would become tedious beyond sufferance. There are, however, a few obvious principles of great importance, which may be borne with.

“ Cider requires a very gentle fermentation, and ought to be confined between forty-four and forty-eight degrees of heat (by Fahrenheit’s thermometer.) Musts, of all kinds, increase their heat by fermentation. Liquors, of all kinds, will not be colder than the air in which they stand. It is easy to comprehend, if these are facts; the impossibility of making *good cider*, when the medium heat of the day exceeds forty-eight degrees. I say the *medium heat of the day*, because our best cellars being fifty degrees of heat in the latter end of October, renders them, generally, unfit for fermenting cider, and involves a necessity of having your first fermentation above ground, where the heat of the day will have its effect. Hence the known fact that cider ferments most kindly in the shade, on the north side of your buildings, wherever the cool nights of the fall reduce the medium heat of the day below forty-eight degrees. During the first fermentation abovementioned, attention must be given to it, that, in case of rising above forty-eight degrees, it should be racked off early in the morning, (before sunrise, if the weather be warm for the season;) this racking checks the increase of heat occa-

sioned by the fermentation : but in late made cider there is seldom a necessity of racking in less than eight or ten days ; at which time there will be a considerable quantity of lees fallen to the bottom of the cask, from which the cider should now be removed.

“ If the air in the cellar be fallen to forty-six degrees, or below, you may place the cider in it, leaving, however, the windows and doors open in the night, until the air becomes as low as forty degrees, (the heat, in my judgment, best for cider during the winter, provided it could be had without artificial heat, which is too difficult to manage, to be applied in cellars.)

“ The earlier made cider, checked in its fermentation by water from time to time, becomes soon fine, and is a very pleasant drink. That made later, and checked in the same manner, with the proportion of one fourth water, is soonest fine, and, during the winter, is not inferiour to the best cider unmixed.

“ During the whole time of fermentation the casks must be kept full, so that the yeast, pulp gas, or whatever you please to call that matter which rises in fermentation, may be thrown out of the cask, and not return into the liquor : for if it does, it operates as yeast, renews the fermentation, and will destroy the cider.

“ In about five weeks after the first racking, it should be again racked, taking care to draw off none of the lees. The bung may be left out a *month* longer without any ill consequence, or at most laid lightly on the bung-hole, when it may be proper, if the fermentation is ended, to bung it down ; in a few weeks it will be fine spontaneously, provided the fermentation has been well conducted. If any part of the process has been injudicious, or unavoidably wrong, and the cider be not fine by the 20th or 25th of February, it should be forced with isinglass. But let me

warn you not to attempt fining it after the 20th of March, unless your cellar be uncommonly secured from air. For the spring will as certainly produce a motion in your cider, as blossoms on the trees; at which time glutinous finings, retaining the air produced or separated by this new fermentation, will be either retained from falling down in the cask, or borne to the surface of the liquor. Three staples of isinglass, dissolved in cider, is sufficient for a hogshead. It should be pulled into small pieces, and covered with cider in an earthen vessel, adding a quart of cider to it every six hours, till it is dissolved; stirring it frequently. When dissolved, which will be in two or three days, strain it through a coarse cloth; add a gallon or two of cider, and pour it into the cask, stirring the whole together with a stick. Leave the bung out; it will generally fine in four or five days. It must not remain above ten or twelve days at most on the finings; if you do not bottle it, it must be racked again into other casks.

If cider is to be kept in casks after May, early in the spring cover the bungs with rosin, or cement of some kind: to do this, open a spile hole while the cement is laid on; otherwise no art can cover the bung effectually: the air from within will force up the cement through the smallest passage, and disappoint a thousand attempts to fill it up: when covered, and the cement cooled, make the cask tight by driving an oaken spile into the hole. Inferiour cider, for the harvest field, is kept by adding a gallon of cider brandy to a barrel. The method I have directed above, produces a fine sweet cider, retaining the taste of the apple. More frequent racking weakens the body and preserves the sweetness; fewer rackings, and laying long on the lees, renders it harsher and more heady. If cider be *well fermented* in *due time*, you may freeze it down to any strength;

taking care to draw it off before a thaw comes on. If cider be imperfectly fermented, the spring produces fermentation anew, and it will destroy itself, unless preserved by distilled spirits, or by brimstone, which last is too offensive to be used." Mr. Cooper, of New Jersey, says, that he finds advantage from burning a match of sulphur, suspended in the cask by a wire, after putting in two or three buckets of cider. To prevent a succeeding fermentation, put in a handful of powdered clay; and to preserve it, add one quart of apple brandy to each barrel. It is said, that if cider become somewhat tart, about half a peck of good wheat, boiled and hulled in a manner similar to rice, may be put into each hogshead (or one quart to a barrel,) which will effectually restore it; and also contribute to preserve it when drawn out of one cask into another." Dom. Ency.

The following method is recommended for trial. "On the evening of the day your cider is made, place it in your cellar. Take one quarter of a pound of isinglass for a hogshead, or two ounces for a barrel, and put it into two quarts of cider: let it simmer and dissolve over the fire. Then put it into your cider, well secured from air except a small vent hole, and your cider will be *perfectly clear, and remain sweet and good for years.*" This process from the New England Farmer (vol. 2, page 121) merits consideration, and the following facts may serve to assist in the explanation of the nature of the process. It is ascertained by chemists, that *gluten* or jelly in must is essential to fermentation,; and the gluten from the isinglass in this process, uniting with the acid from the fruit, produces the desired effect in promoting the vinous fermentation, and rendering the liquor perfectly clear and pure.

HOW TO CLEAN CIDER CASKS.

Casks made of good seasoned oak, iron bound, and well painted, may be used for many years ; but no part of the management of cider is more essential than to keep the casks perfectly sweet and clean ; without which, it is impossible to have good cider. When a cask having contained cider, is emptied, it must be thoroughly rinsed with cold water *immediately*, or otherwise, the lees will sour, and fix an acid that can hardly be removed ; and if long continued, dries on the staves so hard as to require much labour in scrubbing it off: in this case, it should be white-washed with lime—put about one pint of unslacked lime into a barrel, to which pour three or four gallons of boiling water, shake it well, giving it vent ; let it stand till cool, and rinse with cold water ; if it still retains the sour smell, let the operation be repeated. When it is rinsed *perfectly clean* with cold water, pour into a hogshead at least six gallons of boiling water, roll and shake the water to every part of the cask, so as to heat it on all sides ; then pour out the water and lay your cask exactly bung hole downwards, the water running clear and entirely off, *the heat in the cask will dry it perfectly*. In this state, bung it up as carefully as if filled with your choicest liquors, and return it to the cellar and it will remain perfectly sweet and fit for use in the following season. *It is best however, to inspect each cask before you fill it.* This is done by fixing a candle to a wire, three feet long, and letting down the candle through the bung hole into the cask, you can then see every part of the inside distinctly. If it is clean and tight, it is not best to rinse it again with water.

STUMMING CIDER CASKS.

Take strips of canvass, or linen, or cotton rags, about two inches wide, and twelve inches long, dip the

end of each, in melted sulphur to the extent of one inch : prepare a long tapering bung, so that between the two ends, it will fit any hole ; to the small end of this bung, drive in a wire with a hooked end, to hold the match. The match being lighted, let it be suspended from the bung of a cask in which there are a few gallons of cider, until it is burnt out ; and, if necessary, a second match may be burnt. The cask must remain stopped for an hour or more, and then rolled to and fro, to incorporate the fumes with the cider, after which, the cask may be filled up with cider for use.

From the Farmers' and Gardeners' Remembrancer.

1st. The first step towards making good cider, is to procure good fruit. This fruit should be all of one kind, or the juice of each kind should be pressed and preserved by itself. The complete Farmer's Dictionary, says, "The worse the apple is for the table, the better it is in general for cider. The more red the apple is in its rind, the fitter it is for cider, that is to say, if it is at all fit : for I have seen an apple of a very deep red, which was worth nothing for that purpose. A sweet apple, with a tough rind, will always yield a good vinous liquor. The more yellow the flesh of the fruit, the better and finer coloured the cider will be.

2d. The apples which are intended to make cider of the best quality, should be perfectly sound, ripe, and clean. None should be ground together, but such as are of about an equal degree of ripeness. They should not be allowed to remain in a heap till the life or spirit of their juices is lost, and they become insipid and *mealy* ; and as a general rule, they may be said to be in the best state for making into cider, when they are of that degree of ripeness which makes them

most pleasing to the palate; or as the complete Farmers' Dictionary says, the fruit should be ground when it is in the greatest perfection for eating."

3d. The apples should be spread on a floor, under cover, and protected from the weather for the purpose of sweating. When the weather is dry and warm, they should be permitted to remain in this situation four or five days; but if the weather is wet and cool, they should lie a day or two longer.* They should then be picked over, wiped, and dried in the sun, and those which are rotten, or otherwise defective thrown away.

4th. Apples which drop early, commonly called wind falls, or those which are not ripe, or of inferiour quality, may be made into an inferiour kind of cider, which is sometimes submitted to the still, by which, cider spirit is obtained for mixing with store cider and other purposes.

5th. The cooler the weather in which your cider is made, provided it does not freeze your fingers nor your pumice, the better; and it is recommended to choose a time when the wind is from the west or north. Cider, intended for spring and summer use, should be made the latter part of October, or still later, if the season will permit.

6th. The cider-mills, press, grinding mill, trough, and other implements should be perfectly sweet and clean. Some farmers tell us that cider will work itself clear, and therefore, a little want of cleanliness in making it, does no harm. But the truth is, that cider receives offensive, unpleasant, or unhealthy taint, and

*Willich's Domestick Encyclopediâ says, "The duration of the time of sweating may be determined by the flavour of the fruit, as different kinds require various lengths of time—from 8 or 10 days to six weeks. The harsher and more crude the apples are, the longer it is necessary that they should remain in a sweating state."

communicates it as soon as any liquor. The pomace should be laid on the press in clean straw, without using any water.

7th. The finer apples are ground, the more cider they will yield. If the mill is well fitted, it crushes the seed, and gives a peculiar and pleasant aromack bitter to the must, which becomes the more perceptible as the cider acquires age.

8th. The trough to hold the pomace should be large enough to contain a whole cheese at once. The pomace may stand from six to twenty-four hours, according as you wish to give a higher or paler color to your cider. But it should be stirred frequently, if the weather is warm, to prevent fermentation. Joseph Cooper, Esq. of New-Jersey, says, the longer a cheese lies after having been ground, before pressing, the better for the cider, provided it escapes fermentation before the pressing is completed.

9th. The first running from the press, if you would have your cider of the first quality, should be put by itself. Some have gone so far, as to keep separate that which is obtained without pressing. An English farmer says, "as fast as the fruit is ground (I need not say I use the ripest first) the pulp is put into the cheese; at the bottom of the vat is a tap, through which a considerable quantity of vinous juice will run *without pressing*. This is the best cider, and I barrel it separately." The Farmers' Assistant, however, says, "the first and last running of a cheese should be put by itself, as it is not so good as the rest."

10th. When the pressing of the apples is finished, the most careful makers of cider strain it through a hair sieve or coarse cloth, or sand, to separate it from the coarsest dregs. It must then be left to itself, till it has gone through the necessary fermentation; for this purpose some put it into hogsheads, and others into great tubs or vats, wide at top and narrow at bot-

tom, containing from five to twenty hogsheads. In these vessels the heaviest lees subside, and the lighter lees form a crust on the surface, which, when it begins to crack and sink, gives notice of the time to draw off and barrel the cider. This is the English practice in general, but our farmers most usually dispense with vats or vessels, merely for the purpose of containing the must while fermenting. They put it directly into the barrels or casks in which it is intended to remain, at least till racked off some time in the winter or spring. It is then deposited in a cool cellar, and the bungs are usually left out of the barrels till the fermentation begins to subside. The bungs are then driven in tight, leaving a small spiggot vent a while longer if necessary, when at length the spiggot hole is closed, and the vessel made perfectly air tight.

11th. There are three fermentations of which cider is capable, viz. the *vinous*, which produces the alcohol that gives the liquor its stimulating and exhilarating qualities; the *acid*, which turns the cider to vinegar, and the *putrid*, which totally destroys its spirit and texture, and reduces it to a nauseous and poisonous liquid. The principal object in making good cider is to stop the *working* of the cider as soon as the vinous fermentation is completed. There are several modes by which this may be effected. The first mode is, to have the vinous fermentation conducted in vessels air tight, or as nearly so as possible; thus preventing the escape of carbonic acid or fixed air, which gives it life, and causes its briskness. Cider cannot become vinegar unless it can give out carbonic acid gas, (fixed air) and receive oxygene gas, (vital air) which is the principle of acidity, from the atmosphere. If the fermentation proceeds slowly, especially in air tight vessels, the liquor is impregnated with carbonic acid which under different circumstances would make

its way into the open air. It has been a practice to pour a tumbler of oil into the bung hole of every cider cask. This entirely excludes the oxygen of the atmosphere from access to the liquor to turn it sour, and in part confines the carbonic acid which gives it life and makes it brisk and sparkling. Another practice is, to confine by main force, the carbonic acid to the fermenting cider. Dr. Darwin, says he was told by a gentleman who makes a considerable quantity of cider on his estate, that he procured vessels of stronger construction than usual, and directed the apple juice, as soon as it was settled, to be bunged up close, and that though he had a vessel or two burst by the expansion of the fermenting liquor, yet this rarely occurred, and that his cider never failed to be of the most excellent quality, and was sold at the highest price. New cider may likewise be stopped in vessels of no more than common strength, and buried pretty deeply in the ground, or immersed in spring water, in which situation we are told that it may be kept for years, and be very fine when taken up.

12th. It is likewise said, that a handful of powdered clay, or a quarter of a pound of salt petre, or the same quantity of alum, put into a barrel of cider when fresh from the press, or before the fermentation has begun, will so check and regulate that process, that the barrel may be stopped tight immediately, and then will retain all its fixed air.

13th. It is often the case that those who undertake to be very philosophical in the process of manufacturing cider, make a troublesome and expensive job of it, and after all, spoil their liquor. They cause it to undergo so many fermentations, while exposed to the open air, that it loses all its carbonic acid gas, or fixed air, and perhaps, a part of its alcohol or vinous spirit. If the whole fermentation, which is necessary to change the raw apple juice into sound and rich ci-

der, could be conducted in closed vessels, according to Dr. Darwin's theory, as given in paragraph 11, the products of such fermentation, which are alcohol and carbonic acid gas, would be preserved, become incorporated with the liquor, and cause it to be rich and lively, without being harsh and heady. By exposing new cider in open vessels till the acetous fermentation has produced its results, the carbonic acid gas is expelled, but a part of the alcohol is retained. Hence, vinegar will intoxicate, if drank in sufficient quantity. But the carbonic acid gas retained in cider, properly manufactured, exhilarates, without inebriating; stimulates and enlivens, instead of operating like an opiate, and causing those who drink it to become at once wild and stupid. It is the want of understanding these principles which lead so many would-be philosophical geniuses to *doctor off* their cider, and punish themselves by *drinking the dead liquor*. They rack and rack, fine and superfine their cider, till it becomes as vapid as dish-water and as sour as lemon juice, or a something which tastes like a compound of both those articles. It is much better to proceed according to a common practice of New-England cider making, viz. Take the must or new cider directly from the press. Strain it through straw or a coarse sieve into clean and sweet casks; give it no more vent during fermentation than is necessary to prevent the bursting of the vessels, and not draw off till it is drawn for use. It is necessary, however, during the fermentation, to keep the casks full, that the matter which rises may be thrown out of the vessel.

14th. It was well observed by Mr. Winkley, in his communication respecting the mode of making cider, adopted by the religious society called Shakers, that "the slower cider is in fermenting, the better it will be." The reasons are these—if cider ferments slowly, it generally stops working at the end of the vinous

fermentation, and does not pass to the acetous fermentation, which would convert it into vinegar. And if the fermentation proceeds slowly, the fixed air has time to combine, and become incorporated with the liquor, instead of escaping into the atmosphere. By mixing a proper quantity of alcohol (spirit of any kind) with cider fresh from the press, you may stop the acetous, and of course prevent the putrid fermentation. But the spirit so mixed, hastens the vinous fermentation, which, as before observed, is the only fermentation which can be suffered in making *good* cider. The alcohol will check the turbulence of the fermenting liquor, by combining with the carbonic acid gas, which causes the fretting and fuming as well as gives the life of the liquor. Thus Nicholson's Fourcroy says, "*alcohol dissolves the carbonic acid gas, which it condenses and liquifies more than in the proportion of a volume equal to its own.*"

15th. We learn that the religious society mentioned above, make use of cider-spirit, distilled from the lees of cider, to regulate the fermentation of their new cider and fit it for the table. They do not, however, make use of their cider-spirit till they have racked off their cider about the first of January. They then add from one to three gallons of the spirit, to one barrel of cider, and "bung it down air tight, and let it stand till it becomes of mature age." This appears to have been the principal improvement, which has rendered the cider manufactured by the society so famous, and caused it to command an extraordinary price in market. A friend of ours, however, has a mode of using the cider-spirit in refining his cider, still less troublesome, and we believe at least equally efficacious. This gentleman mixes from one to two gallons of cider brandy with his cider, when fresh from the press, and immediately closes the barrel perfectly air tight. In about a month's time, in the or-

dinary temperature of a common cellar in the latter part of autumn, his cider is perfectly fermented, and purified, so as to be in its best state for the table, without the trouble of *stunning* his casks with brimstone, and hazard of their bursting, or any necessity of racking off his liquor.

16th. The quantity of spirit to be thus mixed with cider, we conclude should be in some proportion to the strength of the *must*. If that contains a good deal of spirit, it will ferment quietly and quickly; otherwise, it will be turbulent, and must have vent, or it will endanger the vessel which contains it, and soon become flat and sour. The same thing will take place with malt liquor. Ale, or *strong* beer, which contains considerable alcohol, can be bottled without difficulty; but small beer, which has but little alcohol, is apt to burst the bottles. And in bottling cider, a spoonful or two of brandy or other spirits mixed with the cider in the bottles, will prevent that violent effervescence, which might otherwise burst the bottles. Some writers say, that sugar, honey, molasses, or other sweet substances, mixed with new cider, will strengthen it, and prevent its fermenting to excess. This is probable, for any sweet substance mixed with a due quantity of water, or other mild liquid, will generate alcohol, and the latter will combine with the fixed air, and thus put a stop to its turbulence. But, doubtless, to fine cider with saccharine matter, would require a longer time than with alcohol; and we doubt whether it would be so safe or so effectual to use the former as the latter, in close vessels.

17th. An English writer says, that an infusion of hops is useful in cider, to give it a flavour, and an agreeable bitter. Another recommends grinding elder berries with the fruit, which gives the cider a fine colour as well as flavour. Rye whiskey is likewise recommended as a good substitute for cider-spirit to

mix with new cider. Ginger, cinnamon, spices, raisins, &c. have their advocates, who assure us that they are very good ingredients in cider. But we believe genuine cider-drinkers prefer the clear apple juice. Some advise to make use of bullock's blood, calf's feet jelly, isinglass, &c.* which may be well if the cider needs *doctoring*, but we believe it best to make vinegar of cider which requires to be medicated with such materials, to render it palatable and wholesome.

18th. The complete Farmers' Dictionary, says, that "the best shaped vessels for keeping cider in, are those in which the barrel boards are straight, the vessel broader at one end than the other, and standing on the lesser end with the bung hole in the top. The advantages of this form is, that in drawing off the cider, though but slowly, the skin or cream, contracted by its fermentation, descends and covers the liquor by means of the tapering of the vessel, and thereby preserves the spirit of the cider, which would otherwise evaporate and waste." A sensible writer, whose essay was republished from the "*Farmer's Weekly Messenger*," in our vol. 1, p. 155, has made it apparent that white oak iron bound hogsheads, made of heart stuff, well painted, and of a size to hold about three barrels and a half, and smeared over with some kind of refuse oil, with a little spanish brown and lamp black, once in three years, will prove more convenient and economical than such barrels as are commonly used. Besides, cider ferments more kindly, and keeps better in large than in small vessels. Beer vessels are said to

* Mr. Cooper fines with isinglass or calf's feet jelly, but in case the liquor should not fine in ten days, he directs to rack it again, and repeat the fining as before, but says it is best to rack, whether fine or not, in ten or twelve days, lest the sediment should rise which often happens. The foregoing operation should be performed previously to the apples being in bloom in the spring; it succeeds best in winter, during steady cold weather.

be bad for cider. They spoil cider and cider spoils beer. New vessels made of seasoned oak do well; but those which have been used do better. The religious society mentioned above, clean casks by taking them from the cellar as soon as convenient after the cider is out, (reserving the lees for stilling,) and rinse each clean first with a pailful of scalding water, then with cold, leaving the casks with the bungs down for a day or two. They are then bunged tight and returned to the cellar, or some convenient place proper for their reception. Previous to filling the casks for the season, they are scalded and rinsed as above mentioned." The society of shakers, whose cider has obtained such celebrity that it commands in the market ten dollars per barrel, practice the following method: The grinding trough being large enough to contain a whole cheese, the pomace is allowed to remain overnight before pressing; which contributes much, both to the colour and quantity of the cider. In the morning it is pressed out gradually and put into casks through straw or rather a coarse sieve placed within the tunnel; it is conveyed immediately to a cool cellar, leaving out the bungs till the fermentation chiefly subsides, when the bung is driven in tight, leaving a small spigot vent a while longer to check the pressure, which is finally closed air tight. About the first of January, they will rack it off free from the lees into clean casks. Having put in three or four pails full of cider, a match of brimstone is burnt in the cask until the cider is well impregnated with the fume, and the cask is then filled. After this process they add from one to three gallons of spirit distilled from the cider lees, to one hogshead; fill up the cask with cider, and bung it down air tight, and let it remain till it becomes of mature age. Cider managed in this way, says Mr. Winkley, one of their members, will keep pleasant for years. He would not, however, be

understood to suggest that good cider cannot be obtained without the addition of spirit, especially for immediate use, or the first years drinking; but the spirit will give it a new and vigorous body, and insure its preservation.

A USEFUL METHOD TO PRESERVE CIDER.

“Take your first made cider, which is fit only for the still, and convert it into brandy; put nine gallons of this brandy into a new barrel; then fill the barrel with late made cider well strained, and bung it tight. This gives you the strength of near four barrels of cider in one. The strength given to it by brandy, will preserve its sweetness entire for many years. The barrels should be new and clean. In this manner, any farmer who has the fruit, may put up in six barrels, the essence of twenty barrels of good cider, and keep it until a time of need. It will fine itself and grow better with an increase of age. Beside, if it is not wanted as cider, it is a very pleasant cordial when undiluted; and with the addition of a bushel of wild grapes, bruised, and put into each barrel, it imbibes the peculiar flavour of the grapes, and becomes a very pleasant wine.” (New Eng. Farmer.)

BOTTLING CIDER.

The most proper time for bottling cider is in the month of March or April, before the blossom fermentation takes place, or in cider spontaneously clear, it may be delayed till after this period of fermentation, even late in May, but never during the season of blossoming; for the finest ciders are then somewhat affected in cleanness, and will have a tendency more or less to break the bottles. The liquor should be perfectly clear and transparent, and the bottling should

be in clear weather. Great care should be observed in making the bottles perfectly dry and clean, the remnants of corks or any kind of matter incrusting on the sides, will always impart a bad taste to the cider. A few drops of water will destroy a bottle of cider after it has been well fermented, more effectually than a pint before it has undergone that process. The best of corks should be used, but they should not be immersed in hot water, but dipped in cider, they will drive the easier for this; in driving with a wooden bat, turn the nose of the bottle downward, so that the cider shall come in contact with the cork, otherwise there will be danger of breaking the bottles. Cider should remain 24 hours in the bottles before they are corked, this improves the liquor, and renders it less dangerous to the bottles. A teaspoonful of brandy added to each bottle, is said to have a good effect in lessening the fermentation, and thereby preventing the bottles bursting. About an inch of vacant space should be left in the neck of the bottles below the cork, when placed on its bottom, which should be always during the first season; the bottles may then be placed on their sides with safety. When cider of a superior quality and great vinous flavour, is intended to be preserved for some years, it will be useful to wire down the corks with brass or copper wire. Bottled cider should be kept in a cool cellar, if the light can be excluded, it will be a great additional protection against the heat of our summers. The bottles should never touch, for the concussion which usually attends severe strokes of thunder frequently will crack them when in contact with each other. The best situation for them is a brick cellar floor; with clean dry sand up to their necks, to exclude the air and prevent their jarring, and still more effectually to prevent their bursting during the heat of summer; take a quantity of moss obtained from low, cold, and wet

swamps, cover the bottles while set on the ground in the cellar, and with a watering pot drench the moss once a week or fortnight. This moss retains moisture a long time, and will keep them constantly cool.

"In the transactions of the Mass. Agricultural Society, vol. 2, p. 66, there is an account of an improved method of pressing cider, communicated by Mr. Paul Dodge, of New Castle, State of Maine. Instead of making the pomace into a cheese, the apples after being ground, are put into a curb or vat, and levelled with a shovel; then covered with a plank and blocked up as usual. It may be pressed with a long beam or short cider screw, but hay screws are best. The cider may be pressed in two hours. Two men and a boy may make 20 barrels in one day. As no straw is used, it may be made in cold weather if the pomace does not freeze." (See a description of this implement in the New-England Farmer, vol. 3, p. 65.)

In the New-England Farmer, vol. 3, p. 86, may be found some account of an improved cider mill and press invented by — Hay, Esq. of Milton, New-Hampshire, who says, that with his mill and press, he could make 100 barrels of cider in 24 hours, and obtain more juice than could be gained by the mill and press in common use.

MEDICINAL PROPERTIES OF CIDER.

THIS excellent liquor contains a small proportion of spirit, but so diluted and blunted, by being combined with a large quantity of saccharine matter and water, as to be perfectly wholesome. When of a proper age, and well refined, pure cider may be considered as a pleasant and salutary beverage, and calculated to obviate a putrid tendency in the humours.

Strong, astringent cider, well impregnated with fixed air in bottles, has been found of great utility in va-

rious diseases. In low fevers of the putrid kind, it is not merely a good substitute, but is equally efficacious with port, or other foreign wines.

“*Excellent brandy* is made from apples in the United States, notwithstanding what Chaptal has said on the subject. If carefully distilled from sound apples, and kept a few years in a warm situation, it is very agreeable, when diluted with water. One wine glass full, added to a half gallon bowl of punch, highly improves the flavour of that drink.”

POMONA WINE.

“It is said that several of the agricultural societies have adopted regulations for the encouragement of American beverage, at their annual jubilees. *Currant wine* is to be substituted for *claret*; and the great staple of New England, *cider*, is to be substituted for *Madeira*. The following is a receipt to make it:

“Take cider, made of sound apples, sweet from the press, and leach it through a barrel filled with clean dry sand. After it has passed through, carefully drain it off into a brass or copper kettle, in which it must be boiled one hour over a slow fire, and skimmed clean. After it has been taken off and cooled, strain it through a fine cloth, and put it into a cask that is perfectly clean. Set it in a cool part of the cellar, and let it remain five or six weeks, when one quart of the best French brandy, and one pound of raisins, must be added to eight gallons.

“It ought to be made a year, at least, before it is used. It is needless to state that the quality of the liquor will be improved by age.”

“This American process has, of late years, been imitated in the cider counties, and particularly in the west of England, where several hundred hogsheads of cider wine are annually prepared; and being suppos-

ed to contain no particles of copper, from the vessels in which it is boiled, the country people consider it as perfectly wholesome, and accordingly drink it without apprehension. In order to ascertain the truth, various experiments were instituted by the late Dr. Fothergill; from the result of which, he proved that cider wine does contain a minute portion of copper, which, though not very considerable, is sufficient to caution the publick against a liquor that comes in so questionable a shape. Independently, however, of the danger arising from any metallick impregnation, we doubt whether the process of preparing boiled wines be useful, or reconcileable to economy. The evaporation of the apple juice by long boiling, not only occasions an unnecessary consumption of fuel, but also volatilizes the most essential particles, without which the liquor cannot undergo a complete fermentation, so that there can be no perfect wine. Hence this liquor is, like all other boiled wines, crude, heavy, and flat; it generally causes indigestion, flatulency, and diarrhœa. Those amateurs, however, who are determined to prepare it, ought at least to banish all brass and copper vessels from this as well as from every other culinary process." (Mease.)

The most valuable liquor to be obtained from apples unquestionably, is the cider wine made according to the following process.

APPROVED METHOD OF MAKING WINE FROM CIDER.

To one barrel of cider, when just from the press, add half a pound of sugar to each gallon, and two gallons of brandy, West India spirit, or cider brandy. The cask must be lightly stopped, and filled up every day, while fermenting, for four or five days, and then stopped tight and put into a cool cellar. In three or four months rack it off, and add two gollons more of

brandy to each barrel. Take one quarter of a pound of burnt alum, six whites of eggs, and one pint of clean sand, mixed together, and put them into the barrel when racked, to clarify. When racking, the liquor must be kept from foaming, by letting it run down on a thin board; and when the cask is about half full, while racking, a match of sulphur must be burned in it, and then the cask stopped close and shook, so that the smoke may incorporate with the liquor. In one year this will be equal to sherry wine, and in two, equal to the best Madeira. Having made one cask of this a few years since, it so far exceeded my expectations, that I can with confidence and pleasure recommend it to general notice, as a liquor possessing the qualities of a sprightly, cordial wine, the cheap produce of our own farms, and free from any deleterious metallick impregnation.

APPLE JELLY.

It is not known perhaps, so generally as it ought to be, that apples make an excellent jelly. The process is as follows: They are pared, quartered, the core completely removed, and put in a pot without water, closely covered, and placed in an oven or over a fire. When pretty well stewed, the juice is to be squeezed out through a cloth, to which a little white of an egg is added, and then the sugar. Skim it previous to boiling, then reduce it to a proper consistency, and an excellent jelly will be the product.

OF DISTILLERIES OF SPIRIT FROM CIDER.

It may be gratifying to our farmers, to be made acquainted with an establishment by which their fruit and cider may be advantageously disposed of when their orchards are abundantly productive.

Of Distilleries of Spirit from Cider, copied from a view of the cultivation of Fruit Trees, &c. By William Coxe, Esq. of New-Jersey,

"As these establishments have lately assumed considerable importance to the nation as a great and increasing source of revenue, and are not liable to many of the objections which exist against the distillation of spirit from grain—it may not be amiss to state some facts, founded on incontrovertible authority, to prove that the farmers of our country may calculate on a certain demand from these distilleries for the products of their orchards, however abundant they may be, without apprehension from the jealousy of rival commercial interests, or the narrow principles of colonial policy, which in fruitful years, reduce the price of fruit liquor in the cider counties of England so low, as to be insufficient to pay the costs of manufacturing the inferiour quality.

"Of the quantity of cider spirit distilled in the United States, we have no positive evidence, it is nevertheless certain that the quantity is great, and rapidly increasing in all the older States north of James River.

"In 1810, from the Marshalls returns it appears, that 1103272 gallons were distilled from domestick materials in the small state of New-Jersey; while in Connecticut, in the same year, there were distilled 1374404 gallons—of both these quantities we may safely calculate, that 3-4th parts were the product of cider. In Essex county, N. J. in the year 1810, there were made 198000 barrels of cider, and 507310 gallons of cider spirits were distilled—one citizen of the same county, in 1812, made 200 barrels of cider daily, through great part of the season, from six mills and twenty three presses. In the present season, 1816; 25000 barrels of cider were made within the limits of a single religious society, as it is called, in

Orange township, Essex county, New-Jersey ; comprising about three fourths of the township. Such has been the abundance of apples in many of our eastern counties, that hogs and horses have been kept fat on them till late in December: in the great scarcity of provender produced by the severe drought of the last summer, cattle have been fed on the pomace taken into the fields, and spread on grass grounds, and have been kept in good condition until the end of December. It is the opinion of some judicious men, that as food for animals, the extraordinary abundance of apples, has nearly compensated for the short crop of corn in our great cider districts. These facts might be supported by many others equally strong, to prove the importance of this department of agriculture ; although strictly considered, they do not come within the limits I had originally prescribed for this volume, they appeared to me too important in their nature, and too closely connected with the subjects I have discussed, to suffer me to pass them over without notice.

“A neighbour of mine, of great experience as a distiller of cider spirit, once in the month of August distilled at the rate of 16 quarts and 7 eighths from a barrel of 30 gallons ; i. e. about one 7th of proof spirit. The usual quantity of spirit distilled from early cider on an average, is 8 quarts from a barrel—it has been satisfactorily ascertained, that 14 quarts per barrel is the usual quantity obtained, from the four most celebrated Newark ciders, viz. the Harrison, Granniwinkle, Campfield, and Poveshon.”

VINEGAR.

VARIOUS METHODS OF MAKING VINEGAR FROM THE APPLE
JUICE.

“THE superiority of vinegar made from strong, well flavoured cider,” says Mr. Coxe, “over the ordinary wine vinegar imported from Europe, is generally acknowledged. The manufacture of vinegar has become an important branch of rural economy among our respectable farmers who are from principle opposed to the practice of distillation of ardent spirits: individual dealers in our large seaport towns are engaged in large establishments of this nature—in one instance, in a single parish in New-Jersey, 1200 hogsheads of cider have been converted into vinegar in a single season. The demand for cider for this purpose must be great and permanent, and there always will be a great demand for vinegar in our country. In one season, cider at five dollars per hogshead will be converted into vinegar at 14 or 15 dollars, an advance which will repay the expense and trouble of the manufacture.” Every liquor which has completely undergone the spirituous fermentation, is spontaneously and necessarily disposed to the acid fermentation. Accordingly, every vinous liquor does continually tend to become vinegar, and is actually changed into it sooner or later, according to circumstances, unless carefully prevented by art. There are numerous methods by which good vinegar may be produced from the apple juice by fermentation. The essential requisites are, exposure to the atmospherical air of a warm temperature, and the addition of some extraneous vegetable matter to promote the acetous fermentation. When vinegar is weak and vapid, a small

quantity of alcohol, either cider spirit or that from rye, will increase its strength and improve its qualities.

Cider vinegar may be made by fermenting new cider with *must* of apples, in a warm room or in the open air, where it should be exposed to the sun, the bung of the cask being left open for the discharge of the pomace and filth, and for the admission of air; but the bung hole should be secured from rain, as water proves injurious. In the course of a week or nine days, the vinegar may be drawn off for use. If new cider be put on vinegar, or upon the lees or mother, after racking off the vinegar, it will hasten the operation. When a liquor already fermented is used, it is of importance that yeast or some other ferment be added in order to hasten the fermentation. The following *method* is recommended by a writer in the *New-England Farmer*: "Take raw beets, cut them into disks about half an inch thick, and suspend them through the bung hole in a cask of pure cider. Renew them three or four times, at the intervals of three weeks. Fifteen or twenty pieces at a time are sufficient for a barrel containing 33 gallons of cider. Place your cask in a dry, warm situation, and put on the bung as tightly as the twine on which the pieces of beet are suspended, will admit." It is probable that the saccharine matter in the beet has a tendency to promote the acetous fermentation.

The following is a very cheap, easy, and speedy method of making the very first rate vinegar—Take any quantity you please of the *first* ripe apples that fall, and which are always worth the least for cider, which should either be ground very coarse in a mill, or what is equally good, bruised in a barrel with a common pounder. Then of the coarse ground or bruised apples, put a layer of about two inches deep into the bottom of a clean cask, then a layer of clean

straw of about the same thickness, and so on till the cask is full, observing to press the straw and apples well together with the hand, while filling the cask. Then take one fourth part as much water as the same apples would make of cider, if ground and pressed, and pour a little at a time into the cask of apples and straw. Let it stand two or three hours and then drain it off very slowly, just as you would water through ashes for making lye. And being thus drained off, the same liquor is then to be run through three or four times a day for two days successively. It is then to be put into a clean cask, where it may work standing in the sun. In a short time it will become very fine sharp vinegar. At the last drawing off, it will be necessary to apply some heavy weight to press out the liquor. If one pound of honey be added to each gallon of cider, it will greatly increase the strength of vinegar.



OF PEARS.

It is no longer questionable that the pear tree is well adapted to the climate and soil of New-England. Although much neglected by our farmers generally, numerous varieties are cultivated in different parts of Massachusetts, in great perfection. All the varieties of the pear are hardy and long lived, and will flourish in a clay or loamy soil, but wet situations are unfavourable. Most of the directions already detailed, relative to the cultivation of the apple tree, may be applied to that of the pear tree. The production of particular varieties from the seed is equally capricious, and the annihilation of certain kinds from long dura-

tion, is supposed to be no less remarkable than in the apple. The propagation of particular species is effected by grafting or budding, and by this method any desired variety may be obtained and perpetuated. Considerable attention is necessary in the choice of stocks for grafting. Suckers from other trees should never be employed, as they will have a constant tendency to generate suckers, to the injury of the tree. It should be observed, to graft or bud summer pears upon summer pear stocks; autumn pears upon stocks of the same kind; but never graft a winter pear upon a summer pear stock, for the sap of the summer pear will decline or diminish, before the winter fruit has sufficient time to mature and ripen. Every planter should keep a nursery of free stocks, by planting the seeds of the different varieties, and these should be taken from fair and choice fruit, and in their ripe state. The season for grafting or budding, and the manner of performing the operation, are the same as already described for the apple. The pear tree will succeed very well, when grafted on a quince; in which case, it is preferable to graft under ground in the root, as the tree will be more strong and vigorous; whereas, if grafted above the surface, the produce will be a dwarf tree. "The stock should be from what is called the Portugal quince, which grows as fast as the natural or free stock; and the pears put on them should always be of the soft flesh or butter kind; the breaking pears do not answer so well on this, as on the free stock. In France, all their finest pears of the buttery kind are raised on the Portugal quince stocks." In transplanting pear trees, we are advised, when the land is dry and sandy, to perform the business in autumn, and they will gain root fibres enough to support them, before winter, and will shoot in the spring better than those which are planted in April. But in moist places, it is best to dig the holes in autumn, and

plant in April, as the cold of winter might greatly injure them. The soil for pear trees ought to be two or three feet deep, and they should be planted shallow, that the roots may spread near the surface, and enjoy the benefit of the sun and air ; and by some it is accounted useful to expose the same side to the sun as when in the nursery. Pear trees require but little pruning, comparatively with the apple, and if carried to excess, it proves very injurious. All dead branches, however, and even thrifty ones, which interfere and chafe each other, and every sucker proceeding from the trunk or roots, should be carefully removed. Every large wound should be covered with the composition or cement, as a security against the effects of the sun and weather. If affected with diseases, or infested with insects, the appropriate remedies, recommended for apple trees, must be applied. In the Agricultural Repository, vol. iv. is a communication from Mr. Hammon, of Talbot county, Maryland, to the following purport. "Pear trees, and other fruit trees, are frequently affected, and sometimes suddenly decay, without discovering the causes of their decline. A gentleman of this neighbourhood, some years ago, observing the situation of his trees, and having unsuccessfully used many applications, at length directed their trunks or bodies to be washed with *soft soap* ; and it is not easy to imagine the early change which appeared in the bark and foliage : the bark became smooth and glossy, and seemed sound and beautiful ; and he thought the tree was greatly improved in every respect. I have tried the same experiment, and with equal advantage to apple trees ; and am persuaded they have been greatly benefited by this process. It is used in the spring, and may be repeated in the following years, as frequently as the trees appear to require it. Mr. Peters declares, that he used *soap suds* without beneficial effects ; but it is probable that

the *soft soap* in substance is more powerful, and that having more strength and virtue than the suds, as commonly made, it may more effectually destroy the worms, bugs, and other insects, which so materially injure the trees; and it is believed to be in consequence of their destruction, that the bark and branches are enabled to derive so much improvement from the application of this substance."

Mr. Forsyth's treatise contains his method of managing diseased pear trees, and such as were unfruitful from decay, and has clearly demonstrated, that the quantity of fruit was thereby remarkably increased, and the quality greatly improved. When old trees are affected with canker, or otherwise diseased, by which they are rendered unproductive, his practice is, to head them down in May or June, as near as possible to where they were engrafted. By this method the young shoots soon sprout forth, and grow so rapidly, that in two or three years they bear fruit most abundantly. Mr. F. illustrates his practical principles by two or three striking examples, and by plates representing the trees and fruit. One of the first four which he headed down, was a Saint Germain, which produced nineteen fine, large, well flavoured pears the next year, and in the third, bore more fruit than it did in its former state, when it was four times the size. Another bore four hundred pears the second year; and he finally found, that the trees headed down bore upwards of five times the quantity of fruit that the others did; and it keeps increasing, in proportion to the progress of the trees. "On the 20th of June," says Mr. F. "I headed several standards that were almost destroyed by the canker; some of them were so loaded with fruit the following year, that I was obliged to prop the branches, to prevent their being broken down by the weight of it. In the fourth year afterwards, one of them bore two thousand eight hun-

dred and forty pears, while another tree, not headed down, growing by its side, being twenty years old, bore five hundred pears, which was a good crop for its size : so that there were on the old tree, which had been headed down not quite four years, two thousand three hundred and forty more than on the tree of twenty years growth."

The following is Mr. Forsyth's method of training the trees, that are cut near the place where they were grafted. Every year, in the month of March, (April or May for our climate,) he shortens the leading shoot to a foot or eighteen inches, according to its strength. This shoot will, if the tree be strong, grow from five to seven feet long in one season ; and, if left to nature, would run up without throwing out side shoots. The reason for thus shortening the leading shoot is, to make it throw out side shoots ; and if it be done close to a bud, it will frequently cover the cut in one season. When the shoots are strong, he cuts the leading shoot twice in one season : by this method he gets two sets of side shoots in one year, which enables him the sooner to fill the tree. The first cutting is performed any time during the spring, and the second about the middle of June. When you prune the trees, and cut the fore-right shoots in April, always cut close to an eye or bud, observing where you see the greatest number of leaves at the lower bud, and cut at them ; for, at the foot-stalk of every one of these, will be produced a flower bud. You will have in some sorts of pears, in a favourable season, from five to nine pears in a cluster. This cutting should not be later than April, on account of the leading shoot beginning to grow ; the next topping, when the leading shoot grows quick enough to admit of it, should be about the latter end of June ; and the length of the shoots should be according to their strength, having from three eyes or buds to six on a side. Mr. For-

syth has been successful in renovating old trees when in such an advanced state of decay, that very little, except the bark, remained. He always applies the composition to the wounds, and when, on examination, the root is found to be decayed and rotten, he cuts away all the dead part, to the sound wood, and covers the wound. If the above directions be followed, he says, you will get more pears in three or four years, than you can in twenty-five years by planting young trees, and pruning and managing them in the common way. If it be desired to change the kind of fruit, it will be easy to graft or bud upon the young shoots.

The method recommended by Mr. Knight, for reclaiming old unproductive pear trees is, to cut away all the central branches, retaining those only that are nearly horizontal, and all the spurs of these must be taken off closely with the saw and chisel. Into the extremities of the branches thus retained, grafts are to be inserted at proper distances, so as to form a new crown. It was on an old Saint Germain pear tree, that had been trained to the wall in a fan form, that he adopted this mode. As soon in the succeeding summer, as the young shoots had attained sufficient length, they were trained *almost perpendicularly downwards between the larger branches and the wall*, to which they were nailed. In the second year, and subsequently, the tree yielded abundant crops, the fruit being equally dispersed over every part. Grafts of no fewer than eight different kinds of pears had been inserted, and all afforded fruit, and nearly in equal plenty. The same mode is applicable to common standard trees. By this mode, Mr. K. remarks, the bearing branches, being small and short, may be changed every three or four years, till the tree be a century old, without the loss of a single crop, and the central part, which is almost necessarily unproductive in the fan mode of training, and is apt to become so in the hor-

izontal, is rendered in this way the most fruitful. Where it is not desired to change the kind of fruit, nothing more of course is necessary than to take off entirely the spurs and supernumerary large branches, leaving all blossom buds which occur, near the extremities of the remaining branches.

DISEASE OF PEAR TREES.

Fire Blight.—Pear trees have of late years been subject to a malady commonly called *fire blight* or *brulere*. During the months of June and July, the extreme branches turn black as if burned and suddenly perish. From the extreme branches, the disease extends downwards to the larger limbs, and continues to increase until in some instances the tree is entirely destroyed; and what is very singular, trees while in a healthy and highly luxuriant condition, and loaded with fruit, are so suddenly seized, that they put on this deadly appearance in one night; or in 24 hours, without any apparent cause. Various are the causes assigned by different writers. A writer in the *New-England Farmer*, vol. 2, p. 42, says, on the first appearance of the disease on his trees, being convinced that it was the effect of some internal enemy, he instantly sawed off all the limbs affected. He found the enemy *not at the point* where death ensued, but some inches below it. The insect was very small, but had eaten a complete circle of the alburnum or sap wood, not exceeding the size of a knitting needle, so as completely to intercept the passage of the sap. Having produced the affected limbs and the insects, to the inspection of the late Professor Peck, he was led to investigate the subject, and ascertained that the insect is the *scotylus piri*, and in the *Massachusetts Agricultural Journal*, he has given a particular description of the insect with a plate. It deposits its eggs

between the bud and stem before the month of August is passed. After the egg is hatched the grub eats its way through the cup into the hardest part of the wood and passes through its chrysalis state before the next summer. The late Professor Peck observes that the mischievous effects of this minute insect, are observed in June and July, and that the dead part of the branches should be cut off and burnt without delay, as the insects have not then left them. The writer above referred to, says, that by steadily pursuing the system of cutting off the limbs many inches below the apparent injury and burning them, the insects have been extirpated from his estate. William Prince, Esq. proprietor of Linnæan Botanick Garden, on Long Island, says, the disease is caused by a stroke of the sun, which extracts the sap from the uppermost branches of the trees, or from such as are most exposed to its influence with more rapidity than it can be replaced; or from powerful rays of the sun, heating the bark to such a degree as to nullify the progress of the sap. The only remedy, he says, is to immediately saw off the affected branches one or two feet below where the blight extends, in which case, the tree generally revives. A writer in the American Farmer, published at Baltimore, January 1st, 1821, advances the opinion with full confidence, that it is a warm winter, especially a warm February, followed by a cold March, that destroys our pear trees. It is the order of nature, he observes, that a tree in severe cold weather cannot exist but by a union of the bark with the alburnum or sap wood. That if the latter part of winter is warm, especially if the ground on which the tree stands is rich and cultivated, the sap juice is set afloat and in a short time, winter returns upon the tree in the cold month of March; the sap vessels are instantly contracted, the juices are stagnated, and the limb or tree sickens, and as heat is further applied,

the injury increases till it dies because heat evaporates the juices faster than it can force them into contracted vessels. This rational theory we are disposed to receive as correct, and a probable remedy may be found in the application of cold water to the roots of the trees in the month of February, provided the weather should be so warm as to put the sap in motion. Another writer in the *American Farmer* ascribes the disease to worms in the root, having discovered in the roots of his trees numerous worms, similar in description to the borer in apple trees. Wherever this cause is found to exist, the mode of treatment should be the same as already detailed when treating of the apple tree borer.

A pear tree brought from Holland, and planted in the year 1647, is now in full bloom, standing in the third avenue at the intersection of Thirteenth street, (New-York.) This is probably the oldest fruit tree in America. About seventy years ago the branches of the tree decayed and fell off; and at that time it was supposed the tree was dying; but, without any artificial means being resorted to, new shoots germinated and gradually supplied the roots of their predecessors. The tree now is in full health and vigour, and appears to be not more than thirty years old; the fruit ripens the latter part of August, has a rich succulent flavour, and has been known by the name of the spice pear. (*New York Evening Post*, May 4, 1820.)

Old Endicot Tree.—This tree was brought from England and planted by Governor Endicot, nearly 200 years ago, is now living at Salem, and bears the present season. A scion from this tree produced four bushels the last year.

From the pear is prepared a pleasant liquor, known under the name of perry, which is made in the same manner as cider from apples. In England, particu-

lar kinds of pears are cultivated for this purpose, and the liquor is held in high estimation.

The subjoined list contains a selection, from various sources, of such as are much esteemed as table fruit, or will meet a ready sale at market.

1. *Amory*.—A very superiour pear. Resembles the Saint Michael in size and appearance, but ripens a little earlier; a great bearer and not subject to blast.

2. *Bensell's Winter*.—It is a large, full, round pear, skin yellow, the flesh fine and juicy. It is a fine keeping fruit and a great bearer.

3. *Brocas bergamot*.—A delicious pear, ripe early in October.

4. *Brown beurre*.—Is a large and long fruit, of brownish red colour next the sun, melting, and full of sharp rich juice, slightly perfumed. Indeed, it is one of the best autumn pears we have. Ripens in October.

5. *Catharine pear*.—Of this there are several varieties, the earliest of which ripens in July, and another kind in August. They are considered well deserving of cultivation, as an excellent summer fruit for the dessert and for baking. The tree grows large, and is very fruitful.

6. *Chaumontelle, or winter beurre*.—"It is a large, rich flavoured, melting pear; the skin a little rough; often of a pale green colour, but becoming purplish next the sun, sometimes with a good deal of red. The fruit is left on the tree till the close approach of winter. It is fit for eating in the end of November, and continues till January."

7. *Colmart, or manna pear*.—"Is large and excellent; the flesh is very tender and melting, and the juice greatly sugared. Both in shape and quality, it considerably resembles the autumn, or English bergamot. It keeps through the winter, till the end of February."

8. *Crassane*, or *bergamot crassane*—Is a pear of a large size and round shape, with a long stalk: the skin is roughish; of a greenish yellow, when ripe, with a russety coating: the flesh is very tender and melting, and full of a rich sugary juice. It is fit for use from the middle to the end of November, and is one of the very best pears of the season.

9. *Easter bergamot*, or "*winter bergamot*—Is a large roundish fruit, of a grayish green colour, with a little red: the flesh between breaking and melting. The fruit is fit for the table in February, and keeps till April."

10. *Early summer bergamot*.—One of the finest pears of the summer. It is a highly flavoured delicious fruit, if eaten before it is too ripe.—The skin is green covered with russet spots, turns yellow when fully ripe in July. It is of a round form, not large. The tree is of moderate size, hardy, and free from blight,

11. *Epargne*.—A delicious and much esteemed fruit. Resembles in shape and size the St. Germain. Colour of a greenish cast, with rusty spots. The flesh is melting and the juice sprightly. Ripe in August.

12. *Fine Gold of summer*.—A pear of superior excellence. The size is small, the stem long, growing a little on one side. The skin a rich yellow on one side, on the other a brilliant red, dotted with yellow. The flesh rich and juicy and highly flavoured, ripe the last of July. The tree is vigorous with long hanging limbs.

13. *Garden pear*.—This ripens in November. It is large and rather long; the skin yellow, and the flesh yellow, rich, and juicy. It is cultivated in Massachusetts, and is highly esteemed.

14. *German muscadel pear*, or *muscat allemand*. "A noble, large, pyramidal fruit, with a small blossom on a shallow excavation, and rather a long stalk. When

ripening on the floor, it acquires a red and yellow tint. Its flesh is melting and delicate, full of a spicy, delicious juice, similar to that of Muscadel grapes.—Eatable from March till May. The tree forms a fine crown, and is exceedingly productive.”

15. *Green Catharine, or Rousselet.*—This is by some called spice Catharine. The tree grows in form like the early Catharine, is very hardy, and a great bearer. The fruit fair and fine, excellent in a raw state or baked. The size is rather small, the colour of the skin a greenish yellow russet and spotted. Ripe in August and September.

16. *Green summer sugar pear, or sucre vert*—Has a very smooth green skin; flesh melting and the juice sugary, with an agreeable flavour: the tree is a free bearer. Its period of ripening is in August, and it can be preserved only a few weeks. The tree bears fruit every year, and its blossoms resist the most unfavourable weather.

17. *Grey butter pear*— } Are well known to ama-
18. *White butter pear*— } teurs, and deserve to stand
in every orchard, being excellent autumnal fruits. The white butter pear is also very excellent for culinary purposes, even before it attains to maturity by lying on the floor. In a good soil, it often forms a very large tree; but the grey butter pear is of a lower growth, though with more expanded branches.

19. *Holland table pear.*—This is rather a large pear, of very irregular form, the skin is green with small russet clouds. The flesh is remarkably juicy, melting and sprightly. The stem long. Few pears are more admired at a season when fine pears are common. Ripens in September and October. The tree is of strong and vigorous growth, the foliage luxuriant. It is a great and uniform bearer.

20. *Jargonelle.*—This is a well known, fine summer pear, ripening in August. The flesh is breaking;

sweet, and has a slightly musky flavour. It is best when picked before fully ripe, and matured in the house. The tree is a general bearer.

21. *Little muscat*—Is of an oblong shape, of a yellow colour, except next the sun, where it is red. Ripe in August.

22. *Mons Jean*—Is a valuable pear. It is ripe about the first of November, and will last till the middle of December.

23. *Mogul summer*.—A very large, fair and sweet pear, and a full bearer. Ripe in August.

24. *Orange pear*.—This has been long cultivated in Massachusetts, and is still a favourite fruit among those who are unacquainted with the superiour kinds more recently introduced. The fruit is roundish; the skin of a greenish colour, becoming yellow when ripe; the flesh is melting, and the juice sugary; the flavour pleasantly perfumed. It ripens in August, and, like all summer pears, is of short duration.

25. *Pound pear*—“Is an extraordinary large, thick, oblong fruit, of a greenish gray colour: it is often reared in the vicinity of buildings, to shelter its ponderous fruit from boisterous winds, before it has attained to maturity. Though its pulp be somewhat tough, it is a very useful pear in domestick economy, especially for drying. The tree rises to a considerable height, and spreads its branches; is very productive, and its blossoms are not liable to be injured in the spring.” The fruit should be suffered to remain on the tree till frost, and then preserved in the common manner, for baking and other culinary uses.—There is a variety generally called the small pound pear, which acquires only half the size of the former, but possesses all its valuable properties.

26. *Nonpareil bergamot*—“Is a considerably large pear, with a green peel, containing a mellow pulp of an incomparable aromattick taste. It becomes eatable

in October and November. The tree is one of the largest among the bergamots."

27. *Prince's pear*.—"Is a small roundish fruit, of a yellow colour, but red next the sun: flesh intermediate between breaking and melting: juice high flavoured. The tree is generally a great bearer, and the fruit will keep for a fortnight."

28. *Radish pear*.—"A very superiour summer fruit, the juice of which is so rich, refreshing and agreeably acidulated, that it excels in its kind the gray butter pear. But as it easily becomes mealy, though of a muscadel flavour, when left to ripen on the tree, it ought to be removed, and deposited on the floor. The tree is remarkably fertile, and produces fruit in seasons when almost every other pear kind has failed: hence it deserves to be reared, even in climates and situations not very favourable to orchards; as it is of vigorous growth, and attains to tolerable size."

29. *Rousseline*.—"Is of a deep red colour, with spots of gray; the flesh is very tender and delicate, and the juice very sweet, with an agreeable perfume. It ripens about the latter end of October, but will not keep."

30. *Sarasin*.—"A valuable winter pear, which ought to decorate every orchard, as it may be preserved a whole year. In shape and size it resembles the *brown Louise*, but generally becomes much larger. Its red colour rises on the south side: when it turns yellow in July, acquires a buttery consistence, and is then eatable. This likewise affords an excellent fruit for boiling, drying, and other domestic uses. The tree is tall and vigorous."

31. *Seckle pear*.—"In a letter from professor Hosack, of New York, dated October, 1818, to the London Horticultural Society, and published in their work, we are favoured with the following account of this most estimable fruit:

“The Seckle pear is so named from Mr. Seckle, of Philadelphia, who has the credit of having first cultivated it in the vicinity of that city. It is generally considered to be a native fruit of this country, accidentally produced from seed sown by Mr. Seckle, and the original tree is said to be still standing on the estate of that gentleman. An account, however, essentially different from this, has been lately communicated to me by my friend judge Wallace, of Burlington, to whom I recently paid a visit. He stated to me, on the authority of a correspondent in Philadelphia, that the pear was grown in that neighbourhood, sixty years ago, by a person named Jacob Weiss, who obtained the tree, with many others, at a settlement of Swedes, which was early established near Philadelphia, where Mr. Weiss had built a house. The judge suggested the probability of Mr. Weiss and the father or grandfather of Mr. Seckle having been intimate, as both families were German, and of that rank in society, which might be likely to lead to such an acquaintance. The conjecture therefore, is, that under such circumstances, Mr. Seckle's family obtained grafts from Mr. Weiss's tree.

“Mr. Coxe, in his view of the cultivation of fruit trees in America, an interesting volume, which I have forwarded to the society, after assigning the same origin as I have stated in the beginning of the letter, describes the fruit thus: ‘The form and appearance vary with aspect, age and cultivation: the size generally is small; the form regular, round at the blossom end, diminishing with a gentle oval towards the stem, which is rather short and thick: the skin is sometimes yellow, with a bright red cheek, and smooth; at other times, a perfect russet, without any blush: the flesh is melting, spicy, and most exquisitely and delicately flavoured. The time of ripening is from the end of August to the middle of October.

The tree is singularly vigorous and beautiful, of great regularity of growth and richness of foliage, very hardy, possessing all the characteristics of a new variety. Neither Rosier or De La Quintinge among the French, nor Miller or Forsyth among the English writers, describe such a pear as the Seckle; nor have I found one among the intelligent French gentlemen in our country, who has any knowledge of it in his own."

"I may add to the above, that the fruit is admitted by all to be one of the most exquisitely and highly flavoured we possess. Its flavour is very peculiar, having a factitious aromattick perfume, rather than the natural odour or taste of fruits. The late general Moreau informed me that he had never tasted this fruit in France, the country in which, of all others, the finest pears are cultivated."

32. *Skinless pear, or early ruselet*.—This is a long shaped, reddish coloured fruit, with a very thin skin; the flesh melting, and full of a rich sugary juice. It ripens in August.

33. *Squash pear*.—This pear is cultivated in Massachusetts, and Mr. Coxe thus describes it. The fruit of highest estimation for perry in England; it is an early pear, remarkable for the tenderness of its flesh; if it drops ripe from the tree, it bursts from the fall; whence probably its name. The liquor made from it is pale, sweet, remarkably clear, and of strong body; it bears a price fourfold of other perry.

34. *Saint Germain*.—Is a large, long pear, of a yellowish colour when ripe; flesh melting, and very full of juice, with considerable flavour. If the tree be planted on a dry soil, in a warm situation, and trained against a wall, it bears pretty freely. There are two varieties, a spurious and the true; and it is believed, the former is by much the more generally disseminated. The true is of French origin, and often is very

large, of a pyramidal form, having a thick and dotted green skin, but which, while ripening on the floor, becomes yellow. The spurious fruit ripens in December, remaining green when ripe, and generally decays by the end of January: unless the soil and season be favourable, it is insipid and watery; it is shorter, and its form is subject to more variations than that of the true variety. The true St. Germain keeps in perfection till the end of March, and for sweetness and flavour, ranks among the very best of the winter pears. Mr. Coxe complains that this tree, in our climate, is very subject to the fire blight, so destructive of the finest and most delicate pears in this country; and observes that it would be highly useful to the cultivators of fruit could the cause or cure of this evil be discovered.

35. *St. Michael's* or *yellow butter pear*.—The same as the *Doyenne*, or *Dean pear*. For the richness of its flesh, and excellence of flavour, it is said to be inferior to none except the *Seckle*; and few pears are more admired and extensively cultivated in the United States. The fruit is large, round, inclining to oblong in shape, fair and handsome; its skin glossy and smooth, resembling unpolished gold; occasionally streaked and marked with bright yellow spots. It displays either a blush or bright russet on the south side. The flesh of this luscious fruit is white, and the juice so remarkably cold that it sometimes offends a weak stomach, and occasions eructations. It should be gathered before it is quite ripe, and matured in the house, in order to have it in true perfection; and it may be in use from the beginning of September to the first part of November. The tree does not grow to a large size, but is an early and never failing bearer.

36. *Summer Beurree*, or *butter pear of summer*.—The fruit is of the common size, of a bright yellow when fully ripe. The flesh is sprightly rich and juicy, if

gathered before quite ripe and kept a few days in the house. The tree is of a singular growth, the branches long and bending, with large knobs at the extremities. It bears young and very abundantly. In perfection all the month of August.

37. *Summer good Christian*—Is a large, oblong fruit, with a smooth and thin skin, of a whitish green colour, but red next the sun; full of juice, and of a rich perfumed flavour. It ripens in August. The tree is large, and generally fruitful.

38. *Virgouleuse*.—"A delicious pear, of a pyramidal form, with a deep bloom, and short fleshy stalk. Its peel is whitish green, and, if ripening on a floor, (from December to March,) generally acquires a fine yellow tint: its pulp melts in the mouth, yielding a copious aromattick juice. The tree grows to a moderate height."

39. *Winter baking pear*.—This fruit abounds in Massachusetts, and is much valued as a baking pear. It is not eatable in a raw state, not being juicy or well flavoured. It keeps well through the winter, and the flesh, on being baked, turns to a fine red colour. The tree is not large, but seldom fails of affording an annual crop of fruit.

40. *Winter good Christian*.—The fruit is very large; the flesh is tender and breaking, and is very full of a rich sugared juice. The fruit is in eating from March to June.

41. *Winter thorn*—(Epine d'hiver)—"In size and shape is similar to many kinds of egg-pears. Its peel is at first whitish grey, and turns yellow when ripening on the floor. The pulp is mellow, sweet, and of a delicious aromattick taste. This pear is fit to be eaten in November, and remains sound till the end of January. The tree vegetates with great luxuriance."

42. *Red bergamot*.—This pear is of moderate size, and roundish form, flattened at the ends. The skin is

yellow, the side next the sun of a lively red, dotted with small russet spots. The fruit is very full of juice, of a fine flavour, rich and sprightly. Ripens in August. When the tree is considerably advanced, it is a great bearer.

The celebrated horticulturalist Mr. Knight, has generously furnished John Lowell, Esq. President of the Massachusetts Agricultural Society, with trees and grafts of the following new varieties, the produce of his own ingenious improvement.

Cassiomont.—A large pear, yellow upon one side, and red upon the other. Ripens in October.

Tillington.—It is perfectly melting or rather perfectly beurre, and very rich, sprang from a seed of the autumn bergamot, and the pollen of the Jargonelle, and its form is precisely such as you would expect from such a mixture. It is ripe in November. (This example, observes Mr. Lowell, will shew our cultivators the process of Mr. Knight, and the great changes produced by it. He removed from the flowers of the autumn bergamot all the anthers. He impregnated the germ with the pollen of the Jargonelle. He took the seeds of the fruit, thus obtained, sowed them, and produced a *new pear*, having a mixed form, between that of the Jargonelle which is long and eminently pear shaped, and that of the autumn bergamot, which is flattened, and rather apple shaped: and it ripens nearly two months *later* than either of its parents.)

Urbaniste.—A large and nearly globular pear; colour yellowish green; the flavour of rose water. Season November.

Buerre Knox.—Large, pear shaped, yellow; season, November and December; an excellent pear.

Marie Louise.—Middle sized; colour, pale yellow. Season, November and December; a most excellent variety.

Napoleon.—Somewhat smaller than the Marie Lou-

ise ; exceedingly melting and juicy. Season, November and December.

Florelle.—Middle size, and pear shaped ; colour, bright red, nearly scarlet, with minute dark points ; a most beautiful and excellent variety. Season, November.

Colmar d'Hyper.—Shape, varying from nearly globular to pear shaped ; colour, yellowish green. Season, January—a melting pear of first rate excellence, and very productive.

Passe Colmar.—Large, and pear shaped, but very broad towards the eye, An exceeding fine melting pear, which by being kept in different temperatures, may be brought to table in perfection, from the beginning of January to the middle or end of April. The variety is so productive as to make it necessary, generally, to take off 9-10ths of the fruit.

Hardenpont de Printems.—A large, pale, green pear, with rather a rough skin. It ripens in England in the end of April or beginning of May, and its flesh at that period nearly resembles that of the brown Beurre in autumn. It is a very productive variety, and in our climate, Mr. Knight, thinks will prove the most valuable variety of all.



QUINCE TREE.

THE quince may be propagated by layers, or young sprouts, which must be covered in the earth, or by cuttings taken from the tree in April, and set into the ground at proper distances, where they will take root the first season, and they may be transplanted at pleasure to the place of their ultimate destination. This

tree may also be propagated by budding or grafting ; and, according to Mr. Forsyth, trees thus obtained will bear sooner and be more fruitful than those reared by any other method. Quince trees flourish best, and are more productive in a moist soil, though the fruit from those set in dry situations, is said to possess a finer flavour. The quince tree requires but very little pruning ; the most important part of their management consists in clearing their stems from suckers, and in cutting off such branches as interfere with each other. All luxuriant shoots that strike up from the middle of the tree, must be lopped off, to prevent the head from being too much crowded with wood, which might impede the growth of the fruit. If the tree becomes diseased or rotten, the dead parts should be cut away, and the composition applied, as in apple trees. We are advised to plant quince trees at a good distance from apple and pear trees, lest the farina become mixed, and the fruits degenerate. The quince tree is liable to the attack of the worm *borer*, the same as the apple and pear tree ; and the same remedies are to be recommended.



OF PEACHES.

THE soil and climate of our southern and middle States are considered as peculiarly congenial to the growth of the peach tree, and accordingly, it has long been more generally and extensively cultivated there than in any other section of the union. It is reared on every plantation, and not unfrequently peach orchards, covering many acres, and consisting of several thousand trees, are presented to the view of the trav-

eller. It is, however, more for the purpose of distillery than the luxury of the table, that this species of fruit receives so much attention from our southern brethren; an excellent and highly-flavoured brandy being obtained from it by distillation. It is exceedingly to be regretted, that the peach tree of late years has become liable to premature decay, and the period of its duration is greatly diminished, inso-much, that its continuance in a healthy bearing state seldom exceeds three or four years. This misfortune is increased by the circumstance, that a peach orchard cannot be reared a second time on the same spot, unless the soil be renovated by several years' intermediate culture of other crops. The soil best adapted to the peach tree is a mellow, sandy loam. Situations naturally wet, or inclining to clay, are unfavourable. Water should never be suffered to stand round the roots of tender trees, especially in strong land, as it is apt to produce the mildew, and destroy them.

In England, peach trees are planted against a wall, to which their branches are trained, and nailed either in the fan form, or nearly horizontally, and being the subjects of particular care and culture, it is not uncommon for peach trees to continue to produce annual crops during forty years.

The propagation of peach trees is accomplished either by planting the stones or kernels, or by budding on proper stocks. By the first method there is constantly a great tendency to deviate from the nature of the variety from which the seed was taken, and the variety may be almost indefinitely increased. In Maryland and Virginia, this last mode is adopted without budding, by which numerous varieties are obtained, and among them are found some of superiour quality. It, indeed, on some occasions happens, that the same fruit is produced with that of the seed planted. The stones are planted in beds or drills, in October or No-

vember, or they may be preserved in sand, and planted in March: in this case the stones must be broken open without injuring the kernel, which is the part to be planted. In one year the seedlings may be transplanted in rows into the nursery, which may be done either in autumn or spring. It is to be recollected, that neither the stones nor seedling trees should be planted on ground lately occupied by peach trees, unless the whole of the old roots be removed, and fresh mould be put in to supply the place of the old. But the most certain method of preserving a particular variety is by budding; peach trees thus obtained, always afford fruit in size, colour, and taste, exactly similar to that of the tree from which the bud was taken, and come sooner into a bearing state. Stocks, on which peaches may be budded, besides those of their own kind, are the almond, the apricot, and the plum. The proper season for budding are the months of August and September, and the operation is to be performed in the manner directed for apples and pears. In two or three years after budding, they bear fruit. In taking up the young trees, care must be taken to preserve the roots as much as possible. Such parts as are bruised should be removed, and the small roots may be shortened. It is important that the trees be equally filled with side shoots from top to bottom; for when suffered to run up in single branches, the trees in general are so weak and spongy, that they are unable to bear good fruit. Accordingly when the seedlings are about one year old, Mr. Forsyth recommends to head them down to five or six buds, or otherwise to cut off the extremities of the leading shoots, which will make them send out side shoots, and form a handsome, fruitful tree. None of the shoots should be suffered to grow too long during the first and second years, which is easily prevented by pinching off the tops of them with the fingers during the month

of June. Peach trees when left to their natural course are apt to run up to a long naked stem, with a few naked limbs and small weak boughs at the tops, the tree inclining to one side in an uncomely form, and not capable of bearing much fruit. Peach trees, says Mr. Cobbett, should be so pruned as to give them a good broad form. The tree should in the first place be budded very near the ground. After planting it where it is to stand, cut it down to within 1 1-2 feet of the ground, and always cut sloping, close to a bud. In this foot and a half there will be many buds, and they will the first summer, send out many shoots. Now when shoots begin to appear, rub them all off but three; leave the top one, and one on each side, at suitable distance lower down. These will in time become limbs. The next year, tap the upright shoot that came out of the top bud again, so as to bring out other *horizontal* limbs, pointing in a different direction from those that came out the last year. Thus the tree will get a spread: after this keep down the aspiring shoots; and every winter cut out some of the weak wood, that the tree may not be over burdened with wood. The lowest limb of the tree should come out of the trunk not more than 9 or 10 inches from the ground." When peach trees come into a bearing state, they produce two sorts of buds: where three stand close together, the two on each side are called flower or blossom buds, and the central one is called a wood bud. The former rise immediately from the eyes of the shoots, and are round, short, and prominent, while the wood, or shoot buds are oblong, narrow, and flattish. Sometimes whole trees, or a large proportion of the branches, produce nothing but single flower buds, and in pruning, if a shoot be cut off at a single flower bud, the remains of it, as far down as the next wood bud, it is said, will surely die; it must, therefore, be observed, as a rule, to cut just above the

cluster of three buds, and the wood bud will shoot forth and become the leader, and be prepared to produce fruit the next year.

It is the practice of Mr. Forsyth, when old peach trees run up too high and thin, to cut them down as far back as he can find any shoots or buds, always leaving some young shoots or buds, otherwise there will be great risk of killing the tree. If there are a few young shoots, the top may with safety be cut off just above them, as they will lead the sap up, and produce strong branches, which should be topped, the same as a young tree. The operation should be performed in the month of April, and the young shoots will bear fruit the next season. The composition must be applied to the wounds, where the old branches are amputated, and the canker should be carefully cut out, and any part where the gum is seen to ooze, or the new wood will be affected as it begins to grow. When young trees are overloaded with fruit, it is absolutely necessary to thin them out while small, according to the strength of the tree.

“The premature decay of peach trees has been ascribed to various causes; by some, to the degeneracy of the soil, and neglecting to manure them regularly; by others, to the supposed alteration of the climate, the changes from heat to cold being more sudden and violent now than formerly, when the country was more in forest. But the true causes, as detailed by Dr. Mease, (Dom. Ency.) seem to be the following.”

“Peach trees are liable to three casualties :

“1. The fly, that deposits eggs near the root, and there forms a worm.

“2. The bursting of the bark by severe frosts in wet winters.

“3. The splitting of the limbs at the fork of the tree.

“The fly, which is blue, (but not a wasp,) begins its

attacks about the middle of July, and continues its depredations until the middle of September. It wounds the tender part of the bark, and *generally* at the surface of the ground, there depositing its eggs, which hatch into worms, that prey upon the mucilage and tender part of the bark, until the communication between the root and the branches is cut off, causing the death of the tree. To guard against this, raise a little hillock in the month of June, round the tree, about a foot high, so as completely to cover that part of the bark kept moist and tender at the surface of the ground. This hillock will not stand so long at one height, as to tender the bark above, as the rain will gradually wash it down level with the surface, and must be raised again every summer."

"To take out the worm, the roots must be uncovered, and the spot looked for where the gum oozes out, following the cavity round with the point of a knife, until you come to the solid wood, and lay the whole open: the worm will be found with a white body and black head; which must be destroyed, and the holes carefully filled up with cow manure, rendered adhesive by sand or lime core and ashes, as directed by Mr. Forsyth.

"Soap suds, heated after a family wash, and poured on the roots of trees, about the middle of August, have been used with success in destroying the eggs, or the young worm.

"According to Mr. John Ellis, of New-Jersey, the injury arising from the worm may be prevented in the following way:

"In the spring, when the blossoms are out, clear away the dirt so as to expose the root of the tree, to the depth of three inches; surround the tree with straw about three feet long, applied lengthwise, so that it may have a covering, one inch thick, which extends to the bottom of the hole, the butt ends of

the straw resting upon the ground at the bottom ; bind this straw round the tree with three bands, one near the top, one at the middle, and the third at the surface of the earth ; then fill up the hole at the root with earth, and press it closely round the straw. When the white frosts appear, the straw should be removed, and the tree remain uncovered till the blossoms put out in the spring.

“By this process, the fly is prevented from depositing its egg within three feet of the root, and although it may place the egg above that distance, the worm travels so slow that it cannot reach the ground before frost, and therefore it is killed before it is able to injure the tree.

“The truth of the principle is proved by the following fact, I practised this method with a large number of peach trees, and they flourished remarkably well, without any appearance of injury from the worm, for several years, when I was induced to discontinue the straw with about twenty of them. *All those which are without the straw have declined, while the others, which have had the straw, continue as vigorous as ever.*”*

“To guard against frost, plant the trees where the water will run off, and procure the sweetest and richest fruit, as the inferiour qualities are more injured by cold.

“The splitting of the tree at the forks is guarded against by preserving as many upright branches as can be spared, by breaking off, in bearing years, more than half the quantity of fruit while small, and by pruning almost the whole of every branch beyond where the fruit is set, leaving only a few buds on each, of the succeeding year’s fruit. The size of the fruit is by

* A band of matting, extending about six inches above, and the same beneath the surface of the earth, may be found preferable to straw, as it is easier applied.

these means rendered larger, more beautiful, and of a higher flavour, and the growth of the tree is rendered more vigorous."

"Mr. Thomas Coulter, of Bedford county, Pennsylvania, gives the following directions for cultivating peach trees, which he has successfully pursued in Pennsylvania and Delaware, for forty-five years. See Trans. Amer. Phil. Soc. vol. v.

"The principal causes of peach trees dying while young, are the planting, transplanting, and pruning the *same stock*; which causes the stock to be open and tender, and the bark of the tree very rough: this roughness of the bark gives opportunities to insects to lodge and breed in it; and birds search after these insects, for their support, and with their sharp bills, wound the stock in many places; from which wound the sap of the tree is drawn out, which congeals, and never fails to kill, or to render the tree useless, in a few years. To prevent which, transplant your peach trees, as young as possible, where you mean them to stand; if in the kernel, so much the better; because in that case there will be no check of growth, which always injures peach trees. Plant peach trees sixteen feet apart, both ways, except you would wish to take your wagon through the orchard to carry the peaches away; in that case, give twenty-four feet distance to every fifth row, one way, after transplanting. You may plough and harrow amongst your peaches for two years, paying no regard to wounding or tearing them, so that you do not take them up by the roots. In the month of March or April, in the third year after transplanting, *cut them all off by the ground*; plough and harrow amongst them as before, taking special care not to wound or tear them in the smallest degree, letting all the sprouts or scions grow, that will grow; cut none away, supposing six or more should come up from the old stump; the young scions will

grow up to bearing trees on account of the roots being strong. Let no kind of beasts into peach orchards, *hogs excepted*, for fear of wounding the trees; as the least wound will greatly injure the tree, by draining away that substance which is the life thereof; although the tree may live many years, the produce is not so great, neither is the fruit so good. After the old stock is cut away, the third year after transplanting, the sprouts or scions will grow up all round the old stump, from four to six in number: no more will come to maturity than the old stump can support and nourish; the remainder will die before ever they bear fruit. These may be cut away, taking care not to wound any part of any stock, or the bark. The sprouts growing all round the old stump, when loaded with fruit, will bend, and rest on the ground in every direction, without injuring any of them, for many years, all of them being rooted in the ground as though they had been planted. The stocks will remain tough, and the bark smooth, for twenty years and upwards; if any of the sprouts or trees from the old stump should happen to split off or die, cut them away; they will be supplied from the ground by young trees, so that you will have trees from the same stump for one hundred years, as I believe. I now have trees thirty-six, twenty, ten, five, and down to one year old, all from the same stump. The young trees coming up, after any of the old trees split off or die, and are cut away, will bear fruit the second year: but this fruit will not ripen so easily as the fruit on the old trees from the same stem. Three years after the trees are cut off by the ground, they will be sufficiently large and bushy to shade the ground, so as to prevent grass of any kind from matting or binding the surface, so as to injure the trees; therefore, ploughing is useless, as well as injurious; useless, because nothing can be raised in the orchard, by rea-

son the trees will shade all the ground, or nearly so; injurious, because either the roots, stock, or branches will be wounded: neither is it necessary ever to manure peach trees, as manured trees will always produce less and worse fruit than trees that are not manured; although by manuring your peach trees, they will grow larger, and look greener and thicker in the boughs, and cause a thicker shade, yet on them will grow very little fruit, and that little will be of a very bad kind—generally looking as green as the leaves, even when ripe, and later than those that have never been manured.*

“Peach trees never require a rich soil; the poorer the soil, the better the fruit—a middling soil produces a more bountiful crop.

“The highest ground, and the *north* side of hills is best for peach trees; they keep back vegetation, by which means the fruit is often preserved from being killed by late frosts in the month of April, in the Pennsylvania latitude. I have made these observations from actual experience.

“A gentleman from Monongahela county, in Virginia, called at my house, and asked me who instructed me to cultivate peach trees: I told him that observation and experience were my teachers. The gentleman observed, that colonel Luther Martin, in the lower parts of Maryland, and another gentleman near the same place, whose name he could not recollect, were pursuing the same plan advantageously.”

“The practice of Mr. Coulter, in cutting down the

* “This assertion is directly contrary to the experience of a gentleman in New Jersey, who has remarkably fine peaches, regularly manures his trees every year, and asserts that the speedy decay of common peach trees is owing chiefly to a neglect of the practice. He even said experience convinced him it was owing to the same circumstance, that peach stones did not, in general, produce fruit like the original tree.

trees, is highly rational: they are thus forced to spend their vigour upon their bodies and roots, instead of shooting up into the air with thin barks, which are easily penetrated by the fly.

“The best kind of peaches is said to be produced from inoculation; and upon an *apricot stock*, as they are not liable to be injured by the fly; and that peach trees thus produced, grow larger and rise higher than when on the peach stock. Grafting the peach upon a plum stock has also been practised, with a view of resisting the attack of the fly; but this operation must be performed under ground, otherwise an unsightly knob will be the consequence of the peach tree overgrowing the plum stock, and endanger the breaking off of the tree at the place of junction.*

“The directions given by Forsyth, with respect to wall peach trees, may be applied to our standard trees, viz. to pinch off all the strong shoots in June, the first year the tree bears; which will make them throw out side shoots: these, if not laid too thick, will make fine bearing wood for the succeeding year. If the strong shoots be suffered to grow to their full length they will be large and spongy, and will neither produce good fruit nor good wood for the following year. Sometimes weakly trees are covered with blossoms; but if too much fruit be suffered to remain on them, they will be weakened so much that they will never recover. In that case, I would recommend picking off the greater part of the fruit, to let the tree recover its strength. When trees in this state are pruned, never prune at a *single flower bud*; as the shoot will be either entirely killed, or, at least, die as far as the next wood bud.

* Mr. Cobbett, who has published a book on the subject of gardening, gives a decided preference to the plum stock for peaches, as being closer and harder wood.

“I have often topped the strong shoots twice in the course of the summer, before they produced the fine kind-bearing wood. These strong shoots exhaust the tree, and never produce good wood, when neglected to be topped. I would recommend to cut out such shoots when the trees are pruned in the spring, and to leave only the bearing wood, which may be known by two small leaves, where the flower-buds will be in the following year ; (the strong shoots having only one leaf bud at each eye ;) and to pick off all side shoots near the tops of the branches, as soon as they can be laid hold of.”

In addition to the foregoing details, I must not omit to recommend in strong terms, other means of preserving the health and vigour of this very valuable tree, the fruit of which, when in perfection is perhaps equal, if not superiour to that most luscious of the tropical fruits, the *ananas*. Since it is ascertained that the fly deposits its eggs which produce the fatal worm, in the bark, it is obvious that if the stem of the tree could be enveloped with some harmless substance, it might baffle the instinctive faculties of the fly, or from its hardness, resist its powers of attack. For this purpose, let the earth around the roots and stem be removed, and its place supplied with some one of the articles mentioned in page 107 ; after which, let the whole trunk of the tree and large branches, from the surface of the earth to the top, receive a good coating of the composition of quick lime, cow dung and clay, page 107. This would not be a very expensive expedient even for an extensive orchard, and the preservation of the trees would be an ample reward ; but for a few favourite trees in the garden no person need hesitate to try the experiment, even upon young trees, at the time of transplanting. Should it fail as a preventive remedy against the fly and worm, (which is scarcely possible) the application will have a ten-

dency to increase the growth and vigour of the tree. If in any of the uncovered branches black spots or oozing of gum should be discovered, let the branches be immediately cut away, and the wound covered with the same composition, and young shoots will soon sprout forth and bear fruit. When peach trees have become unproductive from old age or disease, Mr. Forsyth, from long experience, recommends to head them down according to rule, and apply the composition, by means of which, trees in the worst condition may be completely renovated, and rendered abundantly fruitful. Hitherto, the diseases of peach trees among us have eluded all our art and skill : how far a different management may prove successful, time and experience must determine. It may, however, well be questioned whether it is most profitable to renew our stock by frequently planting the seed, or to attempt to protract the existence of old unproductive trees by the application of remedies.

Since writing the above, the following fact has been announced in the newspapers of New York. A very simple mode of preserving and restoring peach trees when apparently nearly destroyed by the disease so fatal to them in this quarter, and commonly called the "*yellows*," has been accidentally discovered by a gentleman in that city. A statement of the fact, as it occurred, will convey all necessary information. In the fall of 1818, a very fine tree standing in his yard, was apparently dead from the effects of the above mentioned disease. Throughout the fall and winter, very large quantities of common wood ashes were casually thrown by the servants about the roots of the tree. To the astonishment of all who had seen it the preceding fall, it put forth its leaves vigorously the next season and bore abundance of fine fruit. A small quantity of ashes was again thrown round its roots last fall, and the tree has now become so full of

fine fruit, that it has now become necessary to prop it up. Another gentleman has since tried the same experiment with all the success he could have desired, and he wishes to have the information as widely diffused as possible. In the New York Evening Post, April, 1823, a writer ascribes the cause of the decay of peach trees, to small grubs, about an inch in length, that breed in the roots, from eggs deposited there the preceding season, and in the spring hatch and feed upon those roots until the tree perishes. He recommends the following remedy, which he says, has never been known to fail. As soon as the buds begin to put forth in the spring, and before the leaves are quite out, remove from the bottom of the tree entirely, all the earth till you come to the bare roots; from which, scrape all the loose, old rotten bark, and destroy all worms that may be discovered; then take three quarts of fresh slacked lime for a large and full grown tree, and so in proportion for a smaller one, and lay it carefully on and about the roots, covering it from the weather, and it will destroy these destructive insects entirely. Lime or ashes should be applied to the roots of peach trees every spring, by way of preventive, and the whole of their trunks should at the same time receive a thorough brushing over with soft undiluted soap. According to Mr. William Prince, proprietor of the Linnæan Garden, on Long-Island, the disease called the *yellows* is evidently contagious. It spreads at the time when the trees are in blossom, and is disseminated by the pollen or farina blowing from the flowers of diseased trees, and impregnating the flowers of those which are healthy, and which is quickly circulated by the sap through the branches, foliage, and fruit; causing the fruit, wherever the infection extends, to ripen prematurely. In order to stop the progress and prevent the farther extension of this disease, Mr. Prince recommends from his own ex-

perience, that as soon as a tree is discovered to possess the characteristic of the disease, which is known by the leaves putting on a sickly yellow appearance, but of which the premature ripening of the fruit is a decisive proof; it should be marked, so as to be removed the ensuing autumn, which must be done without fail, for if left again to bloom, it would impart the disease to many others in its vicinity.

“A good peach possesses these qualities: the flesh is firm; the skin is thin, of a deep or bright red colour next the sun, and of a yellowish green in the shade; the pulp is of a yellowish colour, full of highly flavoured juice; the fleshy part thick, and the stone small. They are generally divided into *free stone* and *cling stone peaches*. Those varieties, the flesh of which separates readily both from the skin and stone, are the *proper peaches* of the French, and are by English gardeners termed *free stones*. Those with a firm flesh, to which both the skin and the stone adhere, are the *pavies* of the French, and by English and American gardeners named *cling stones*.

LIST OF CHOICE PEACHES,

From McMahon's American Gardener, and other sources.

ALL the varieties, he observes, may be cultivated to advantage in every state of the union, if soil and exposure be given agreeable to their nature and necessities. 1. The Early Avant; 2. The White Nutmeg; 3. The Red Nutmeg; 4. Early Mignonne; 5. Early Ann; 6. Early Newington; 7. Early Elizabeth-Town; 8. The White Magdalen; 9. Red Clingstone; 10. White Clingstone; 11. Kennedy's Caroline; 12. Royal George; 13. Oldmixon; 14. Late Heath; 15. La Plata; 16. Georgia; 17.

The Congress ; 13. Bourdine ; 19. President ; 20. English Incomparable ; 21. Chancellor Rambouillet ; 22. La Titon de Venus ; 23. La Pourprie ; 24. Belle Chevreuse ; 25. Noblesse ; 26. Bellegarde ; 27. Large Yellow Freestone ; 28. White Pavie ; 29. Monstrous Pavie ; 30. Clifton's Nutmeg ; 31. Lemon Peach ; 32. Large Newington ; 33. Carolina Clingstone.

1. *Admirable peach*.—A very large and comely fruit, of an agreeable mixture of colours. Its pulp, though rather firm, has a delicate taste, contains a sweet, vinous juice, of a fine flavour, and is pale red near the stone. It becomes eatable about the middle of September.

2. *Alberge, or orange peach*—Is one of the most elegant and best flavored of the clingstones ; rather large than otherwise ; round ; dark red or purple next the sun, and bright orange on the other side ; being deeply furrowed from the stem to the blossom end ; the flesh of a deep orange colour, but purple at the stone ; ripens in August. The tree is a very great bearer.

3. *Aune peach, or early Ann*—Is a small, round fruit, of a yellowish white colour, faintly tinged with red on the sunny side ; ripening about the middle of August.

4. *Bellegarde, or Galande*.—This is a beautiful, large and excellent peach, with a strong tint of red on a yellow ground, and of a deep red shade on the south side. Its pulp, though rather firm, yields a sweet juice, of an agreeable taste. Ripens in September.

5. *Blood Peach*—Makes a beautiful preserve, and is cultivated chiefly for that purpose. The tree is hardy, and a great bearer.

6. *Boudine*—Is a large, round fruit, of a fine red next the sun ; the flesh white, melting ; juice vinous and rich ; ripens in September. The tree a plentiful bearer.

7. *Catharine*.—A large, round fruit, of a dark red next the sun; the flesh white, melting; full of a rich juice; a clingstone—ripens in October.

8. *Charlestown*, or *ananas peach*.—Is a new sort, reared in America from the kernel. Although its colour is inferior to that of most other peaches, being a uniformly pale yellow, without any red tint, yet its firm and juicy pulp possesses the delicious flavour of the pine apple. It ripens in October.

9. *Early Newington*.—Is a fruit of middling size, of a fine red next the sun; flesh firm, with a sugary, well flavoured juice. There are several varieties of this fruit, all clingstones; ripening in August and September.

10. *Heath peach*.—Of all peaches, perhaps of all fruits, it is said, there are none equal in flavour to the American *Heath peach*, a clingstone. It is large, weighing near a pound, in common; with but moderate attention, it is believed, they would very generally weigh a full pound. It is backward in ripening northward of the Susquehannah, and is generally one of the last sort that ripens. "This very fine clingstone peach is generally esteemed the finest in our country: the original stone was brought, by the late Mr. Daniel Heath, from the Mediterranean; it has ever since been propagated from the stone, in Maryland, where I have seen it in great abundance and high perfection, as a natural fruit, in September and October. It is usually propagated in this and the adjoining States by inoculation: I have for some years raised them from the stone, and have now a number of vigorous trees from stones, brought from Maryland. It is a very large fruit, of a form rather oblong, and uniformly terminating in a point at the head; the flesh is singularly rich, tender, melting and juicy; the stone frequently opens, disclosing the kernel: the skin is a rich, cream coloured white, sometimes with a faint

blush, but the finest peaches are entirely white; the juice is so abundant, as to make it difficult to eat this peach without injury to the clothes; the leaf is luxuriant, and smooth at the edge; the tree vigorous, hardy and long-lived, compared with other trees: the fruit ripens in September, lasts through the month of October, and is frequently eaten in high perfection in November. It is of all peaches, when not too ripe, the most admired, when preserved in sugar or in brandy," (Coxe's Cultivation of Fruit Trees.)

11. *Large mignonne*—Is somewhat oblong in shape, and generally swells out on one side. The juice is very sugary, and of high flavour. This is one of the most handsome and delicious fruits, of a dark red and greenish yellow cast; having a white, melting and agreeable pulp, containing a sweetish vinous juice, and is in eating about the middle of September.

12. *Large yellow rareripe*—Known at Kenrick's nursery by the name of Jacque's rareripe—an entire new sort, recommended by colonel Jacques, and Gorham Parsons, Esq. as a fruit possessing superiour qualities, and weighing 17 or 19 ounces. The tree, says Mr. Kenrick, exceeds in growth all other peach trees.

13. *Lemon clingstone*—Is a large, late, but beautiful and high flavoured peach. It ripens the last of September and beginning of October.

14. *Monstrous pavie*.—This is the largest of the peaches, and a true ornament to the dessert, as it displays a beautiful red tint on a white ground. Its pulp is white, though red in the parts next the stone, and contains a vinous, sweet juice. Ripens in September.

15. *Noblesse*—Is a large fruit, red or marbled next the sun; flesh greenish white and melting; juice very rich in a favourable season.

16. *Old Newington*—Is a large round fruit, of a beautiful red next the sun; the flesh white, and melt-

ing; when ripe, the juice very rich and vinous: a clingstone, and matured early in October.

17. *Rambouillet*—Is a fruit of middling size, deeply divided by a furrow; the flesh melting, of a bright yellow colour; juice rich, and of a vinous flavour: ripens about the middle of September. The tree is a good bearer.

18. *Red rareripe*—“Is a peach of uncommon excellence, frequently called Morris’s rareripe. It is of unusually large size, sometimes weighing eight and nine ounces; of a round form, beautiful red and white skin; rich, tender and melting flesh, full of sugary, highly flavoured juice; equal to any peach cultivated at the same season. Ripens in the early and middle parts of August. Clear at the stone.” (Coxe.)

19. *Red magdalen*.—It is large, round, and of a fine red next the sun; the juice very sugary, and of exquisite flavour: ripening in the end of August. The tree is a free grower, and a great bearer.

20. *Red nutmeg*—Is a great bearer, and valued for its early maturity. It is of a bright vermilion colour, and has a fine musk taste. Ripens in August.

21. *Royal George*—Is an excellent peach, and in a very good soil and aspect the fruit becomes large; dark red next the sun, juicy and high-flavoured.

22. *Swalch*.—This is a fine, pleasant-flavoured peach. Ripens early in September.

23. *Teton de Venus*—Is a fruit of middling size and longish shape; of a pale red next the sun; flesh melting, white; juice sugary, and not without flavour: ripens the end of September. The tree is a free bearer on a warm light soil, but the fruit comes to perfection only in fine seasons.

24. *Vanguard*—Is a good peach, ripens about the middle of September.

25. *White Magdalen*.—The fruit is of a middle size, round, with a deep furrow; of a pale colour, and the

flesh white to the stone ; melting, juicy, with considerable flavour. Ripening in August.

26. *White Rareripe*, or "*White cheek Malacotan peach*— Sometimes called the freestone heath : is a fruit of uncommon excellence. The size is large ; the flesh a rich white, inclining to yellow, melting, rich, and finely flavoured ; firm, like the flesh of a clearstone plum : the skin is a pale yellowish white : the stone frequently separates on the opening of the peach, leaving the kernel exposed ; the shells adhering to the flesh, though a freestone. It is the most admired fruit of the season, which is in August." (Coxe.)



NECTARINES.

THE nectarine is so closely allied to the peach in its nature and qualities, as to require no particular description or detail respecting its culture or management, whether in health or disease. It will succeed well if engrafted or budded on a peach, plum, or apricot stock. The plum is preferred by some as being a harder and tougher wood, less liable to the attacks of the worm ; but it should be engrafted beneath the surface of the earth. The fruit bears a close resemblance to the peach, though the flesh is finer, and the skin is smooth and naked, free from fur or down. In our climate, the tree will be benefited if sheltered and protected by buildings or a board fence. It should always be planted in cultivated ground, and great care should be taken to guard against the worm at the root, and the various species of aphides which perforate the bark. The roots in winter should be surrounded with tanner's bark, or some substance to se-

cure against the severity of frost, and in the spring give their trunks a thorough coating of whitewash or of soft undiluted soap. All stone fruit is liable to suffer injury by a small bug called curculio, which stings the fruit and causes it to fall from the tree. (See page 109 for a particular description.) It has been found by experience that the depredations of these insects may be prevented by paving the ground round the trees, as far as the branches extend, as it is well ascertained that the curculio will not infest those trees where they cannot find means of immediately concealing themselves in the earth, on dropping from the branches. The following are esteemed among the best on the list of Nectarines.

Brugnon,	Red Roman,
Early Scarlet,	Yellow,
Golden,	White French.
Murry,	



CHERRIES.

THERE are several native varieties of the cherry in the United States, which have been perpetuated from the seed, unaided by the hand of culture, and, as supposed, without any deviation from the original stock. But the cultivated kinds are far more valuable, and it is greatly to be regretted, that they are so generally neglected. Many advantages would accrue to the farmer from the cultivation of the cherry tree: it would serve the useful purposes of ornament and shade to his orchard and buildings, and the fruit would afford his family not merely an innocent, but a salutary luxury; and if near a market, the profit would remunerate him for all his labour and expense.

The cultivated cherry, when reared from the seed, is much disposed to deviate from the variety of the original fruit, and, of course, they are propagated by budding or grafting on cherry stocks: budding is most generally preferred, as the tree is less apt to suffer from oozing of the gum than when grafted. The stocks are obtained by planting the seeds in a nursery, and the seedlings are afterwards transplanted. Those kinds which are called heart cherries are said to succeed best on the black mazard stock; but for the round kind, the Morello stocks are preferred, on account of their being the least subject to worms, or to cracks in the bark, from frost and heat of the sun.* The whole method of management pertaining to cherry trees is so precisely similar to that already detailed, when treating of peach trees, that very little remains to be said on the present occasion. But the following directions given by Forsyth, in his treatise on fruit trees, will probably be acceptable.

“In choosing and planting of young cherry trees, the same rules are to be observed that are given for apricots, peaches and nectarines; and they must in like manner be headed down the first year.

“In pruning cherries, never shorten their shoots; for most of them produce their fruit at the extremities, the shortening or cutting off of which very frequently occasions the death of the shoot, at least of a great part of it. The branches, therefore, should be trained at full length. I have often seen the whole tree killed by injudicious pruning. Wherever the knife is applied, it is sure to bring on the gum, and afterwards the canker, which will inevitably kill the trees, if no remedy be applied to the wounds. I have headed down a great many cherry trees, which were almost

* The small black cherry that grows wild in the woods, answers very well for stocks for any kind of cherries, more especially if it is desired to have the tree grow very large.

past bearing, and so eaten up by the gum and canker, that the few cherries they bore were very bad.

“In the years 1790 and 1791, I headed down fifty trees. The operation should be performed in the month of April in each year. These trees made shoots from three to five feet, the same summer, bore fine cherries the next year, and have continued to bear good crops ever since.

“To the above trees I applied the composition. At the same time I cut down twelve trees in the same row, but did not apply the composition : these twelve trees all died in the second and third years after. One tree where the composition was applied, now produces more fruit than the whole number formerly, also much finer and larger.

“When cherry trees are very old and much injured by large limbs having been cut or blown off, (which will bring on the canker and gum) the best way to bring them to have fine heads, and to fill the vacant space, is to head them down as low as possible, taking care to leave some small shoots, if there be any ; if not, a bud or two at the end of some of the shoots. Sometimes it is difficult to find any buds. In that case, before you mean to head the trees, make some incisions in the branches. This should be done on different branches, at the most convenient places for filling the tree with good wood. The size of the incisions should be from one to two inches, according to the size of the branches, observing to make them just above the joint, where the buds should come out.

“The time for performing this operation, is March, April or May. The above method is only recommended where there are no young shoots or buds, and when the tree is in the last stage of the canker.

“Where you find a few young shoots or buds, cut down the head as near to them as you can, and take care to cut out all the canker till you come to the sound

bark. If any gum remains, it must be cut or scraped off: the best time for this is when it is moistened with rain; it may then be scraped off without bruising the bark. This operation is very necessary.

“Wherever the bark or branches have been cut off, the edges should be rounded, and the composition applied. If the young shoots are properly trained, they will produce fruit the following year; and in the second year they will produce more and finer fruit than a young tree which has been planted ten years.

“Never make use of the knife in summer, if it be possible to avoid it, as the shoots die from the place where they are cut, leaving ugly dead stubs, which will infallibly bring on the canker. These shoots may be cut in the spring to about two eyes, which will form a number of flower-buds.

“When cherry trees begin to produce spurs, cut out every other shoot, to make the tree throw out fresh wood: when that comes into a bearing state, which will be in the following year, cut out the old branches that remain; by that method you will be able to keep the trees in a constant state of bearing, take the same method as before directed with the fore right shoots.

“Great care should be taken to rub off many of them in the month of May, leaving only such a number as you think will fill the tree. By so doing your trees will continue in a fine healthy state, and not be in the least weakened by bearing a plentiful crop of fruit. The reason is obvious; the great exhalation which would be occasioned by the sun and air in the common mode of pruning, is prevented by the composition keeping in the sap which nourishes the branches and fruit. I cut some trees as directed above, more than twelve years ago, that are now in as good a state of bearing as they were in the third year after the operation, and likely to continue so for many years.

“In 1797 I cut some very old trees in the month of

May, which were left to show the old method of pruning; I at the same time cut some branches off the same trees, according to the new method, to show the difference of the fruit, which was taken by all who saw it for a different sort of cherry. The cherries from the old spurs were not half the size of the others, and were at least three weeks later.

“Several persons have adopted the new method with great success, and by renovating their old trees, which scarcely bore any fruit, have obtained from them an abundant quantity. But even the increased *quantity* of the fruit is not so material in cherries, as the increase in the *size* and in the *richness of the flavour*. In this respect the method of pruning here laid down is invaluable. When old standard cherry trees become decayed and hollow, I would recommend heading them down, as directed for wall trees and dwarfs. Scoop out all the rotten, loose, and decayed parts of the trunk, till you come to the solid wood, leaving the surface smooth; then use the composition as directed for fruit trees.”

“The following are the principal cherries cultivated in the United States.

“*May Duke*—Ripe in May and June: long stem, round and red, an excellent cherry, and bears well.

“*Black heart*—Ripe in June: a fine cherry.

“*White heart*, or *sugar cherry*—Ripe in June: white and red.

“*Bleeding heart*—Ripe in June, a very large cherry, of a long form, and dark colour; it has a pleasant taste.

“*Ox heart*—Ripe in June: a large, firm, fine cherry.

“*Spanish heart*—Ripe in June.

“*Carnation*—Ripe in July: it takes its name from its colour, being red and white; a large round cherry, but not very sweet.

“*Amber*—Ripe in July.

"*Cluster*—Planted more for ornament or curiosity than any other purpose.

"*Double blossom*—Ripe in July.

"*Honey cherry*—Do. small sweet cherry.

"*Kentish cherry*—Ripe in July.

"*Mazarine*—Do.

"*Late Duke*—Do.

"*Red heart*—Do.

Black Tartarian.—This incomparable fruit was brought from St. Petersburg to London by a British botanist in 1796, from whence, the late Ebenezer Prebble, Esq. imported a tree some years after, by which it has been propagated in the United States. It is a constant bearer; succeeds better by grafting than any other sorts; is of larger size, and may be said to be in eating from the time it is two thirds grown till some time after fully ripe; and as evidence of superior excellence, has generally brought double the price of the best black hearts in Boston market.

White Tartarian.—A fine pleasant fruit, a little inferior to the black Tartarian. Ripe in June.

Elkhorn cherry.—This excellent fruit grows to a large size, and is scarcely surpassed in its good qualities by any other sort.

Black Eagle— } Two of Mr. Knight's new sorts
Waterloo— } may be purchased at Kenrick's nursery next season.

"*Morello*—Ripe in July and August: a red, acid cherry, the best for preserving, and for making cherry brandy.

"*Early Richmond cherry*.—This fruit originated near Richmond, in Virginia, and is the earliest cherry in America, and valuable on that account: it is the size of a May Duke, and resembles it in form.

"*Red bigereau*—A very fine cherry, ripe in July: of a heart shape.

"*White bigereau*—Ripe in July and August: remarkably firm: heart shape.

“*Large double flowering cherry*.—This tree produces no fruit, but makes a handsome appearance in the spring, when it is covered with clusters of double flowers as large as the cinnamon rose; it differs from the common double flowering cherry, which never forms a large tree, and has small pointed leaves.

“The three last were imported from Bordeaux, in 1798.

“*Small Morello cherry*—Called also, Salem cherry, because it came originally from Salem county, New-Jersey, is cultivated by Mr. Cooper, of that state, who values it highly. The fruit has a lively acid taste. The tree produces abundantly, and is the least subject to worms of any cherry tree.

“Mr. C. says that the Bleeding Heart suits a sandy soil, but the May Duke will not flourish in it.”

Besides the foregoing list, the *black mazard*, or natural cherry, with its several varieties, should be mentioned as excellent fruits, and valuable for being later than the others. They make very useful and hardy stocks for propagating other varieties. This fruit ripens in June or July, and is used by way of bounce in rum or brandy. Another native fruit is the common red cherry which abounds in New-England. The fruit is not of a superiour quality, being very acid, unless perfectly ripe: it might perhaps be improved by grafting and proper cultivation.

The *wild*, or *native black cherry*, of spontaneous growth, is deserving of some attention. The fruit, when infused in rum or brandy, imparts its astringent and cordial qualities, and forms a pleasant and salutary liquor. The bark of the root of the tree is very astringent, and makes a useful stomachick bitter; and the wood is frequently employed by artists as a tolerable substitute for mahogany, being susceptible of a handsome polish.

Cherry brandy is made in the following manner:

Fill the cask with cherries; pour over them as much brandy as the cask will contain. When it has been on ten days, draw it off, and pour on hot water: let this remain some time, shaking the cask frequently; then draw it off, and mix the last with the first liquor.

Both cherry and plum trees are subject to the annoyance of the cherry and plum tree weevil, (*Rhynchæus Cerasi*) producing a disease which will prove fatal unless remedied. See plum tree.



APRICOTS.

THE apricot tree is raised from the stone, and propagated by budding or grafting on their own stocks or any kind of plum stocks. Their treatment is in all respects the same as the peach and nectarine trees. The best time for planting the trees is in autumn, and the best soil is a light loam. In our climate this tree should be screened from easterly and northerly winds; otherwise, it is said they will not bear fruit, though they may grow large. They do not attain to a bearing state so soon as the peach by one year. Some kinds ripen their fruit earlier than others. The following are those best adapted to our climate:

- The Black Apricot,
- The Brussels Apricot,
- The Breda Apricot,
- The Early Apricot,
- The Large Early Apricot,
- The Peach Apricot,
- The Moors Park Apricot,
- The Turkey Apricot.

THE PLUM.

PLUMS are natives of the United States, and have for many years been propagated from the stones with little variation from the original fruit. The kinds cultivated in our gardens have chiefly been brought from Europe or produced from the stones of imported plums. To insure a choice kind it is necessary to engraft or inoculate on peach or plum stocks. The soil should be a rich mould and their whole management should be the same as already detailed for other stone fruit trees. Plum trees have for a number of years been greatly annoyed by an insect called by the late Professor Peck, the *cherry weevil* which has proved fatal to a large proportion of our stock. The disease first appears in the form of black irregular tumours on the branches and twigs which increase in number and size until the whole tree becomes affected. The seat of this disease is in the bark, in consequence of its being perforated by the insect. The sap being diverted from its regular course is absorbed entirely by the bark, which is very much increased in thickness, the cuticle bursts, and rough irregular tumours are formed. "The wood besides being deprived of its nutriment, is very much compressed and the branch above the tumour perishes. The cherry tree is affected in a similar manner." The insect which proves so destructive to our cherry and plum trees, Professor Peck ascertained, is found in the bark in the month of June, and it leaves its residence before the end of that month. The only remedy in our power, therefore, is to cut off every diseased branch before the last of June, or as soon as discovered, and commit them to the flames. If this method were adopted and persevered in with all the trees in a neighbourhood, the destructive enemy might be in a great measure

extirpated, and the fruit preserved. The most probable method of preventing the attack of this insect, is during the whole summer season; to keep the bark of the tree with its branches, well coated with the white wash composition, which it is supposed will baffle their efforts. In order to guard against the attack of the worm at the root, lime or ashes should be applied every spring, and if their trunks were surrounded with tanner's bark, it would be an additional security. It is a fortunate circumstance that there are, according to Mr. Prince, of Long-Island, some kinds of plum not subject to the attack of the insect; among which are the following:—Chicasaw, Early Coral, Golden Drop, The Cherry plum, Flushing Gage, Yellow Egg plum, Balmer's Washington, a much celebrated gage plum, which has weighed four ounces, and has a superiour flavour, and beautiful appearance. The following list in addition to the above, comprises a sufficient variety of the most approved kind.

Blue Gage,	Large Queen Claudia,
Green Gage,	Little Queen Claudia,
Red Gage,	Smith's Orleans,
Yellow Gage,	Large Red Orleans,
White Gage,	French Copper,
Holland plum,	Magnum Bonum, red
Cooper's plum,	Magnum Bonum, white or egg
Swiss plum,	plum,
Jacinth,	Emperial Violet,
Cloth of Gold plum,	
American or common Damson.	

CURRANTS.

The different species of currants will thrive on almost any soil, but they require the benefit of manure and culture, annually, to make the fruit large and the juice rich. The goodness of the fruit depends very much upon their having the full benefit of the sun and air, to mature and give the berries a proper balsamic quality. By planting some on the south, and some on the north side of a wall, they will yield fruit from June to October. The red currant is preferable to the white as yielding richer juice, and in greater abundance. Currants are easily propagated in the following manner. Take the most luxuriant slips or shoots of a year's growth, set them in the ground about eight inches deep, and not less than twenty-four inches distant from each other; they soon take root, and begin to bear in two years: the roots should be kept from suckers and grass. When the bush has stood two years in the nursery, plant it where it is to stand, and take care that it has only one stem. Let no limbs grow nearer than six inches of the ground. Prune the shrub every year and keep it thin of wood, leaving the middle open; the limbs extended; and when these get about three feet in length cut off every spring all the last year's shoots. To cultivate on an extensive scale for the purpose of making wine, set the bushes in rows, six or eight feet between each bush, with intervals of proper width and at regular distances for passing across the rows. It is estimated that an acre well cultivated will probably yield on an average, a quantity of fruit sufficient to make one thousand gallons of wine annually. The expense of making this wine is about fifty cents a gallon.

The common black currants are larger than the red or white, but they have a peculiar flavour, which

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

TO MAKE CURRANT WINE.

Gather the fruit when fully ripe, rejecting all unripe berries; let them be picked in fair weather and washed, break them well in a tub or vat, (some have a mill constructed for the purpose consisting of a hopper fixed upon two lignum vitæ rollers,) press and measure the juice, having first strained it through a flannel cloth. To every gallon of pure currant juice add two gallons of cold water, then to every gallon of this mixture, immediately put three pounds of good brown sugar, stir it well till the sugar is quite dissolved, and then fill up the cask and put it into the cellar to ferment. Be careful not to let the juice stand unmixed over night, as it should not ferment before the mixture is made. Observe that the cask be sweet and clean, and such as never has had either beer or cider in them, and if new let them be first well seasoned. The cask must not be so full as to work over. Lay the bung or a rag lightly over the hole to keep out flies, &c. In three weeks or a month, or as soon as the fermentation is over the bung-hole may be stopped up, leaving only the vent hole open, till it has fully done working, then stop it up tight, and in six months it will be fit for bottling or for use. Like other wine, however, it improves much by age. If you intend to make thirty gallons agreeably to this

receipt, you require eight gallons of juice, sixteen of water, and seventy-two pounds of sugar. When you draw off the wine, bore a hole an inch at least above the tap hole, a little to the side of it that it may run clear off the lees. Dr. Mease (Dom. Ency.) gives also the following receipt which has been used successfully for many years. Take fourteen pounds currants when fully ripe, three gallons cold water, break the currants in the water and let them be therein two or three days and stir them once each day. Strain the liquor from the fruit and stalks and add fourteen pounds sugar, which being well mixed with the currant liquor the whole may then be barrelled and left fourteen days without the bung: after which bung it close and bottle it at Christmas, previously adding to every ten gallons one quart of brandy. A small quantity of the outer rind of orange peel will give this wine a grateful flavour. Currant wine is supposed to be greatly improved by the addition of brandy, in the proportion of one pint to every gallon of the mixed liquor, but it must be added before the fermentation takes place, that the spirit may check in some measure the violence of the fermentative process, which if carried to excess is apt to generate an acidity in the wine.



ORNAMENTAL TREES.

The following is selected from the very ample catalogue of William Prince, Esq. proprietor of the Linnæan Garden at Flushing, Long Island—presumed to be the most extensive establishment of the kind in the United States.

Horse Chesnut. White flowering, Yellow flowering, Scarlet flowering.

Mountain ash. European, American.

Black walnut.

Butternut.

Catalpa, much admired for its showy flowers.

Elm. American white, Slippery, English.

Locust tree, several varieties.

Honey locust, or *thorny acaica*.

Oak, several varieties.

Willow, weeping and several others.

Tulip tree, or *white wood*, very stately and ornamental.

Button wood or *American sycamore*.

Pride of India.

European Linden or *lime tree*.

Kentucky coffee tree, of singular growth with spikes of purple flowers.

Weeping ash, of singular appearance.

Venitian sumach or *purple fringe tree*. This beautiful tree is covered during summer with tufts of russet coloured down, and forms the most singular ornament of the garden.

American chesnut.

Chinese ailanthus, or *tree of heaven*. This tree attains to an enormous height, and its leaves are four feet long. It retains its foliage till very late in the season.

Umbrella magnolia, with very large, white, fragrant flowers.

Glaucous magnolia, with flowers of exquisite fragrance.

Double flowering magnolia.

Blue flowering magnolia.

Splendid magnolia, with leaves two or three feet long, and flowers twelve inches in diameter of a delightful fragrance.

Evergreen trees and shrubs, an extensive variety.

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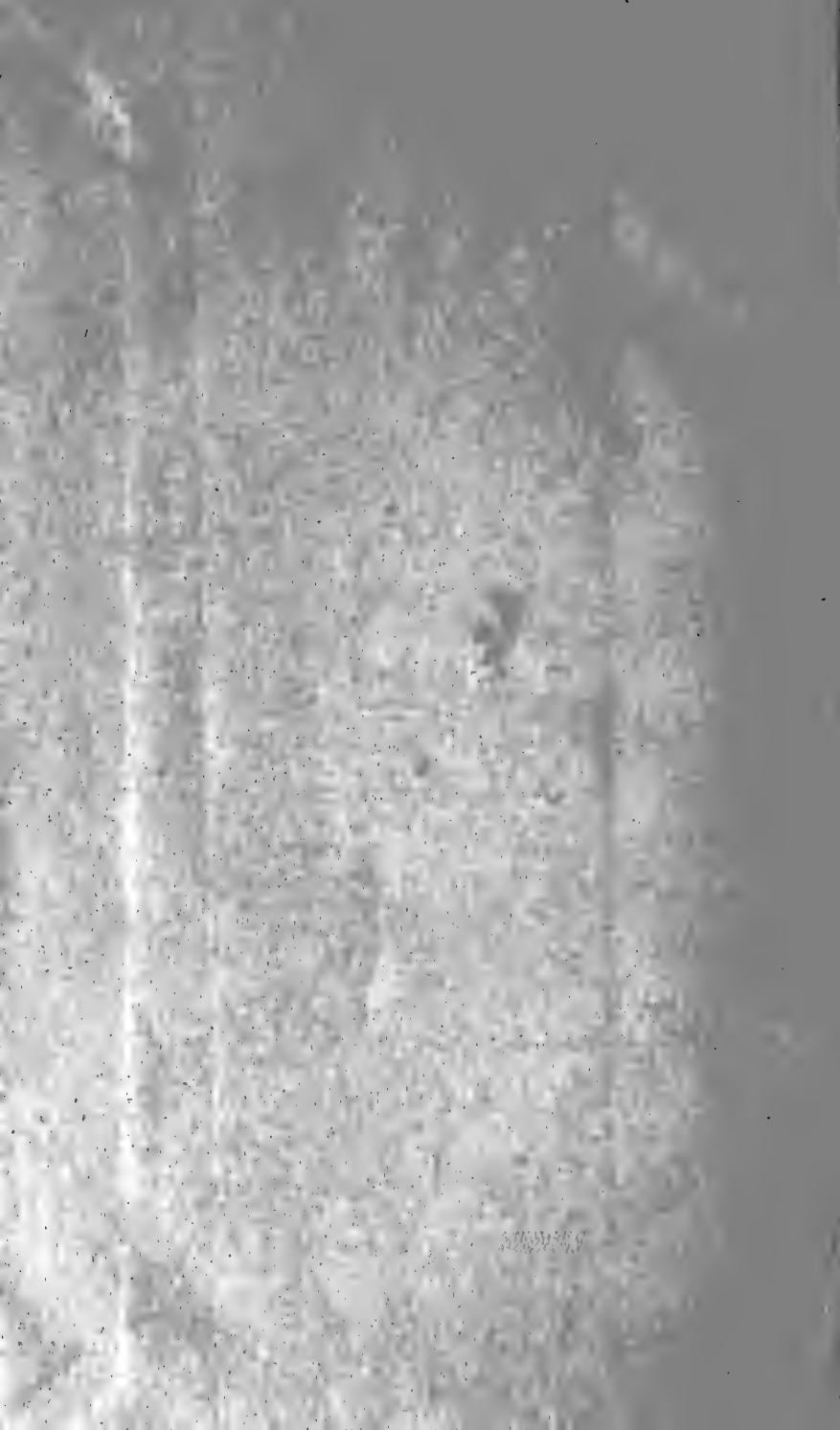
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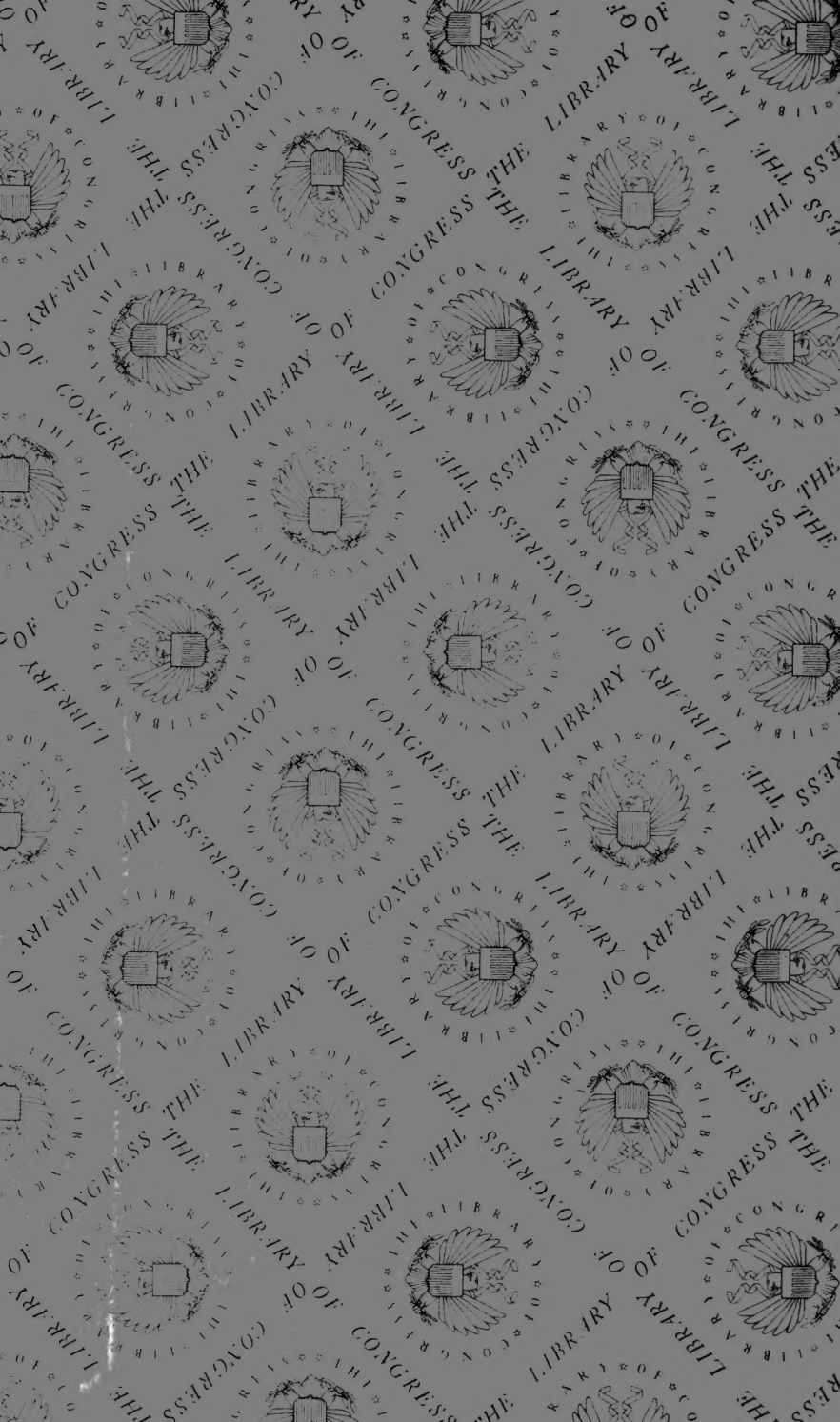
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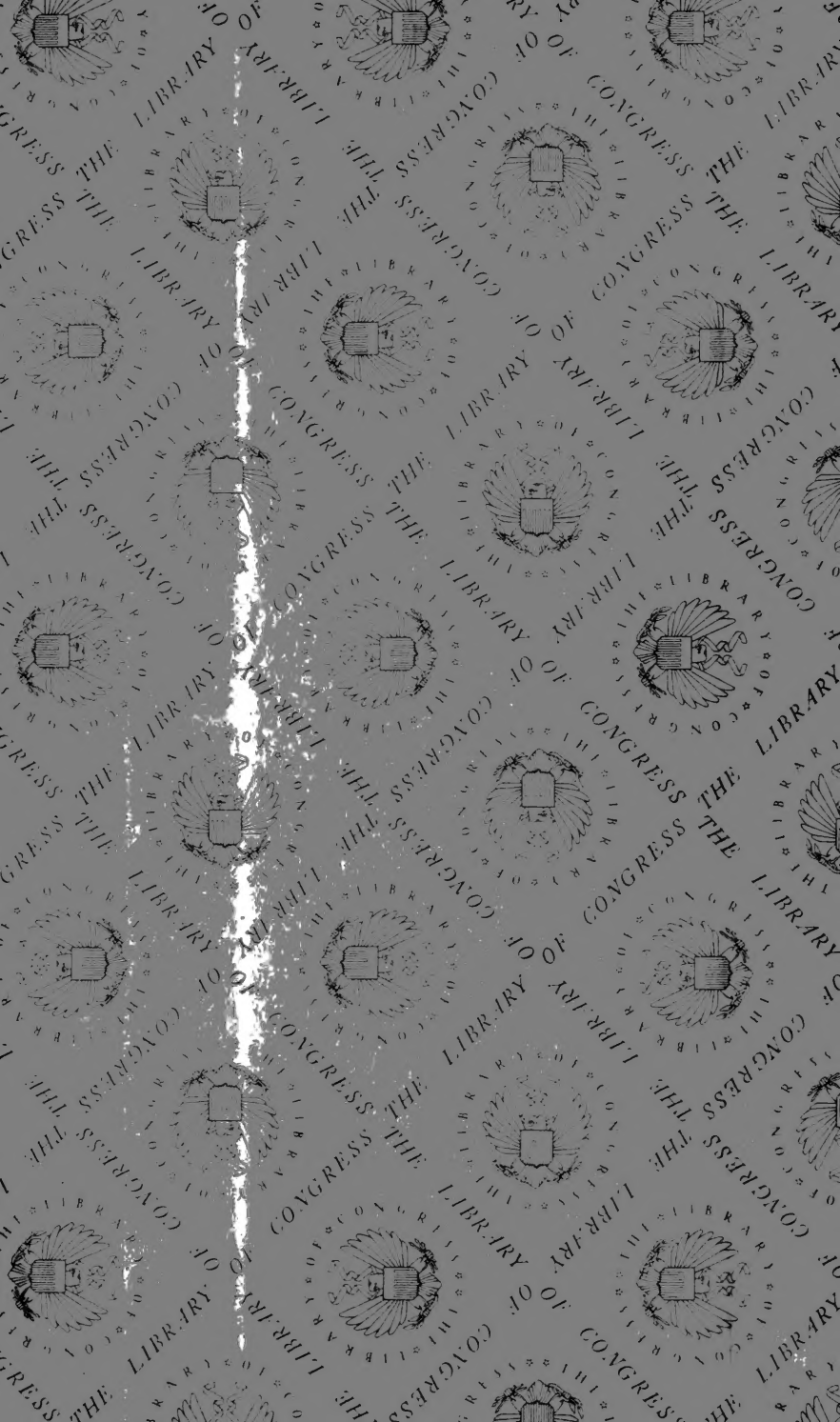
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