



GEORGE IV.

THE SOUTHERN
APPLE AND PEACH CULTURIST,

ADAPTED TO

THE SOIL AND CLIMATE OF MARYLAND, VIRGINIA, THE CAROLINAS, GEORGIA
AND FARTHER SOUTH, INCLUDING PORTIONS OF THE WEST
AND WEST VIRGINIA, CONTAINING

FULL AND PRACTICAL INSTRUCTIONS

IN

SUCCESSFUL CULTURE, GRAFTING, BUDDING, TRAINING, TRANSPLANTING,
MULCHING, PRUNING, FRUIT-GATHERING, &c., &c.,

TOGETHER WITH

Descriptive Catalogues

OF THE MOST ESTEEMED ORCHARD FRUITS, SUITABLE FOR THE TABLE, THE
KITCHEN, AND FOR MARKET PURPOSES,

WITH ILLUSTRATIONS.

ALSO

A TREATISE ON INSECTS AND THEIR EXTERMINATION.

BY

JAMES FITZ, Keswick, Va.,

*Practical Horticulturist, member of the Virginia Horticultural Society
and the American Pomological Society.*

J. W. FITZ, Editor,

Prof. West Tennessee Female College.

J. W. RANDOLPH & ENGLISH,
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PREFACE.

One of the most prominent authors on American Horticulture, says in the preface to his excellent work on "Fruit and Fruit Trees," "A man born in one of the largest gardens, and upon the banks of one of the noblest rivers of America, ought to have a natural right to talk about Fruit Trees." Our Grand Sire, Adam, also *first saw the light near a garden*—cultivated fruit there. That same garden was the source of a "noble river." The author of this work was not born in a garden or on the banks of a noble river; but on the breezy summit of a red-land mountain in Piedmont, Virginia—not so high, perhaps as that mentioned in Holy Writ, where all the kingdoms of the earth were shown in one view, but high enough for salubrious atmosphere, and for the pure air to play among the green foliage and white blossoms of the waving orchards in Spring, and the bending trees laden with red, striped, and golden burdens of tender, luscious apples in Summer and Fall; that might vie with the allegorical apples of Paradise—that flouted their tempting beauty and sweetness amid the groves in the garden of Eden.

The Peach too, the melting, juicy, nectared Peach, in all its perfection, grow here in the bright sun and ambient air. No borer ever, *in those days*, presumed to work destruction to its roots, or winged insects sting the soft blushing cheek of its downy fruit, that hung in delicious clusters, wooing the hand to reach forth and take.

Reared amid these surroundings, the author, in the recollection, regrets the lethargy that at present pervades the South in regard to fruit culture, and the degeneracy of fruits; and like the celebrated author just referred to, thinks he has a right to talk, and investigate the causes of both, to discuss freely *all other points* appertaining to successful, remunerative fruit-culture. He also hopes, from his practical know-

ledge and experience in horticultural and pomological pursuits, and from his valuable correspondence, and select and copious cullings from the best authors, both British and American, and a thorough examination of their views, to fill the vacuum that exists in Southern horticulture, by supplying the information so much needed in the successful culture of fruit-trees.

The prevalence of this apathy and inattention in a large, enlightened, rural community, whose soil and climate is unsurpassed as it regards adaptation to fruit trees, their longevity, luxuriant growth and perfection of fruit, is only to be accounted for by assuming that the agricultural interests of the people have monopolized not only their soil, but their energies, leaving only the "*truck-patch*" and a small part of the garden for fruit trees, and scarcely a thought about their cultivation.

We hope in the following pages to show the impolicy of a course so exclusive; and we might say so prejudicial to the community; as good health, good living, and good morals, to say nothing of pecuniary results that will rival cotton or tobacco, are prominent benefits that will certainly reward the care and attention bestowed on fruit-trees.

Although this work is arranged and intended for Southern and Western latitudes and climates, yet its use is not incompatible with wide range and general patronage; and with modifications to suit particular localities may be used in almost all sections of our country.

THE AUTHOR.

October, 1872.

PREFATORY REMARKS BY THE EDITOR.

The Author and Editor have been at great pains to render this work, the first of the kind published in the South, complete and exhaustive in the specialties of which it treats—in a word, a practical standard treatise for the farmer's and fruit-grower's library.

The numerous select lists of fruits for the various geological sections of each state are valuable, and may be implicitly relied on. As to this feature, it is unique and exceptional.

Fruit nomenclature, hitherto in such confusion, has received the attention its importance merits, and incorrect names have been signified under the requisite changes.

The Pilot and Albemarle Pippin, celebrated apples of this Piedmont country, have been for the first time introduced into a standard book. Shakspeare surely would have enjoyed them, as witness, Justice Shallow to Falstaff: "You shall see mine orchard, where in an arbour we will eat a last year's pippin of my own grafting," and again, Sir Hugh Evans, in the "Merry Wives of Windsor," "I will make an end of my dinner—there's pippins and cheese to come."

En passant, with deference, though the American Pomological Society in its Catalogue places the Newtown pippin, as the general name, and the Albemarle pippin as the local name for the same apple, yet we apprehend it is still a question which name ought to have precedence—a point to be inquired into.

As to foreign varieties of apples and peaches, but few have been tested with satisfaction. Of the former, some of Russian origin, such as the Tetofsky, have met with favor in the Northwest.

Southern pomologists should make trial of varieties of Southern Europe, and such parts of Asia, as in topical aspects are under like isothermal lines.

The Male Carle, the famous commercial apple of Italy, is well adapted to the South.

As the statistics of census of 1870 teach, horticultural progress is making rapid advances, and soon our Southland will be famed for its supremacy in fruit culture.

Pomological Societies should be established in every county, and chairs of Horticulture and Pomology well endowed, be founded in every college.

Iowa is in advance of Virginia in this regard.

The manufacture of the work is creditable to Richmond enterprise.

Mr. Kennedy Palmer, artist and attaché of the Richmond Enquirer Office, executed the engravings. As a work of this character should be both critical and comprehensive, it, of course, required great labor and peculiar qualifications in the author to produce it; hence, whenever preceding writers have described any matter well and clearly, he has endorsed them in their exact language. The results of his own experience are embodied in the work.

Appropriately to the foregoing, I may invoke the saying of a wise man, *alius alio plus invenire potest*; and to the same intent that of my Lord Coke, *nihil simul inventum et perfectum est*.

In conclusion, let me direct the attention of farmers and fruit-growers to the study of botany, entomology and meteorology, as bearing specially upon pomology, which is now a science; and the principles of the facts upon which it is based should be thoroughly comprehended.

J. W. FITZ.

Keswick, Va.

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INTRODUCTION.

It will be readily perceived, on examining authors on fruit culture, that the South has been neglected, not only by Northern agriculturists, horticulturists and pomologists, but also by Southern writers, some of whom were, and are, eminently qualified to handle this subject in a most comprehensive and masterly manner.

Perhaps no portion of the world can boast a more congenial and favorable climate than that part of the American continent which our title page designates, for fruit of almost every kind, and especially for the most palatable, wholesome, medicinal and valuable of all fruits—the apple and peach.

Situated between the extremes of Northern and Southern lines, deemed unfavorable to high flavor and delicious perfection, the field for successful culture is so ample, congenial and universal, that it is passing strange that able pens have not diffused among Southern farmers the art and science of horticulture and pomology in all their practical and interesting details, and the value, growing and care of young orchards understood and appreciated as it should be.

It is admitted that, to some extent, we are aroused on the subject, and are convinced of the natural advantages of our soil and climate; and that many thrifty orchards are cultivated with abundant success in the various portions of the Southern States, except in the maritime districts of the Carolinas and Georgia, which are sandy and level and the air replete with humidity, rendering that section not so well adapted to the apple and peach, but well suited for the culture of other delicious fruits.

Although English and Northern writers are profuse in general and particular directions and instructions in the culture and management of fruit trees, yet such works mostly apply to the particular humid climate of the one and arctic

location of the other, in which their own experience, although limited as to latitude, is very properly brought to aid them in their valuable compilations and publications. This ignorance, however, of what is best for more favorable climates, renders these works less valuable here, although the general culture and management may approximate to that proper for more favorable latitudes.

Still the question might be asked, Why will not Northern tillage and management and varieties of fruit answer about as well in the South? We reply, as farther objection, that climate makes the difference in all these things, or in the most of them. A list of fine apples and peaches originating and flourishing at the North, and the leading domestic and market fruits there, when carried to Virginia and farther South, lose their distinctive features: for instance, a winter apple at the North is a fall or early autumn apple here, and autumn fruit there becomes summer fruit here, and so on throughout all the different varieties in the catalogue. Time of cultivation, pruning, modifications in the culture and general treatment of the soil, have also some part in making up the difference between Northern and Southern success in cultivation.

Special and *select* catalogues, carefully prepared and arranged to suit our latitude and that of more Southern States, as well as portions of the West, will be found in this volume; and the author has spared no pains or expense in consulting pomologists and others of the different States of the South, from Maryland to Georgia, and the West, not only in regard to a list for general cultivation, but for lists for special localities, and for a succession of fruit during the different seasons, suitable for market and home consumption, for cider, and for all other purposes.

The author is not aware of the existence of any regular and extended treatise on apple and peach culture suitable for the latitudes designated in this work, although numerous valuable papers and articles have appeared from time to time in our excellent agricultural journals, from which, in compiling certain portions of this work, he has not failed to avail himself of their invaluable aid; and, in addition to his own views

and experience, numerous standard works, both British and American, have been carefully consulted. Nor has the author troubled the reader with a useless parade of quotations from different authors, but he has, when deemed proper, adopted their observations where his own were either defective or totally wanting. Some of those to whom he is most obliged are A. F. M. Willock, English author, with American notes by James Mease, M. D.; *The British Fruit Gardener and Art of Pruning*, by Thomas Abercrombie; *Kitts' Treatise on Fruit Trees*; *Bradley on Gardening*; *Art of Gardening*; *Knight on the Culture of the Apple and Pear*; *Philosophical Transactions*; *Plan of an Orchard*, by George Lindley; *Bucknel's Orchardist*, London; *British Fruits*; *Guide to the Orchard and Kitchen Garden*, by George Lindley, London; *The Orchard and Fruit Garden*, by Charles McIntosh, London. American authors: *The New England Fruit Book*, by R. Manning; *The Pomological Manual*, by Wm. R. Prince, New York; *The American Orchardist*, by James Thacher, M. D., Boston; *A Treatise on Horticulture*, by Wm. R. Prince, New York; *Fruits and Fruit Trees of America*, by A. J. Downing, New York and London; *Insects Injurious to Vegetation*, T. W. Harris, Cambridge, Mass.; *The Practical Entomologist*; *Fruits of America*, C. M. Hovey; *The American Fruit Book*, S. W. Cole; *Elliott's Western Fruit Growers' Guide*; *Barry's Fruit Garden*; *Bridgman's Fruit Cultivators' Manual*; *Thomas' Fruit Culturist*; *Rivers' Miniature Fruit Garden*; *Gardening for the South*, William N. White; *Fuller's Forest Tree Culturist*; *A View of the Cultivation of Fruit Trees in the United States and of the Management of Orchards and Cider*, by William Coxe, &c.

In addition to the above works on horticulture and pomology, we have had access to most of the magazines and periodical works treating on subjects connected with our work. Our correspondence with numerous fruit-growers and nurserymen have been valuable and satisfactory. For these esteemed favors we return our sincere thanks. From the information they have furnished, coming from different parts of

the country, we have been enabled to solve doubts and elucidate many facts connected with fruit-growing.

In addition to the scarcity of horticultural information suited to the South, a farther inducement for the writing and compilation of this work was suggested by the impulse lately given to agricultural and general improvement; and from the tide of emigration now flowing into Virginia and the South from the North and elsewhere, seem to render a treatise on "Fruit Culture" almost indispensable, as, it is presumed, such new settlers have many things to learn in regard to our climate, &c., that will not admit the delay attendant on practical experience; and more especially will information be desired as regards "*apple and peach culture*"—the art of producing the most valuable of fruits.

The advantages to be derived from diffusing among the people a scientific, comprehensive and practical treatise on horticultural and pomological subjects suited more especially for our Southern and Southwestern latitudes, must be apparent to all who have bestowed the least thought upon the subject. Not only is the culture of fruit a source of pleasure, but, if rightly understood and practiced, it is in many localities a money-making occupation—an interesting, easy and safe way to accumulate wealth—conducive to the health and comfort of man—"a labor of love," with ever increasing pleasure as the work proceeds.

Nothing immoral can grow out of employment so beneficial, but, on the contrary, an occupation so innocent and useful has a tendency to exalt our views of the goodness of Providence in bestowing the rich gifts of the vegetable kingdom with a profuse hand. The Almighty Power that sustains the universe, that points the course of the glorious orb of day and the silvery retinue of night, also unfolds the tender blossoms and flowers, and teaches our hands the art to aid in developing the green tree, the prolific buds and the golden fruit.

Sound and matured fruit is at all seasons grateful to the palate, nutritious, medical and desirable. It is especially in demand during the inclement season of snows and bleak

winds, for we have some weather of that sort in Virginia, and even farther South. How delightful to sit by the social board and enjoy the juicy, luscious apple, or the preserved products of the no less aromatic peach, the small fruits, done up in the shape of pies and tarts, jellies, &c. To the juveniles of the family circle, more especially, is the treat to be desired at this season, and the idea of such a repast makes bright eyes sparkle, and

Little mouths can never pout
When the apples are about.

The old, the middle-aged and everybody likes a good mellow apple, and its use at all seasons is extremely conducive to the pleasure and health of all.

Mr. Thomas S. Pleasants, of Petersburg, Virginia, in a valuable article on "Diversity of Agricultural Productions," says: "The business of fruit culture admits of almost infinite expansion; for though continually increasing, the demand is always ahead of the supply. It has been prosecuted in the vicinity of Norfolk with extraordinary success for a number of years, and to some extent along the margin of the large water-courses, where the facilities, both for production and transportation, are equal to any other locality. The contiguity of extensive sheets of water is a certain protection against the damaging effects of late frost. Peaches and apples are considered among the most profitable crops that can be grown, as they are always in demand at high prices on the spot, wherever a skipper can navigate his craft. The early apples from a thrifty and well-established orchard have been sold as high as a thousand dollars per acre. As there is no limit to the demand, the farmer can scarcely err in devoting a part of his premises to the culture of this fruit, always being particular to select the *very earliest* varieties. In passing, it may be well to give a caution against any Northern variety for domestic use in winter. Owing to the length of our seasons, they arrive at maturity too soon in the fall to admit of being kept for that purpose."

It appears from the experience of all farmers who have planted orchards, that trees furnished by nurseries of our own

State, Virginia, *grow better* than those brought from Northern States, and that our nurserymen know better what trees to recommend for different locations within the State, and are more reliable than those obtained from traveling agents. The same may be said of more Southern localities.

A good writer says, "It is much to be regretted that so many orchards throughout the South are so badly cared for. It is not enough, as some appear to think, to plant an orchard and fence it, and go annually for a crop of fruit. There are thousands of trees that have never been pruned nor manured."

In favorable situations these trees will still live and produce fruit, but in localities less favorable they die or gradually produce smaller crops and poorer fruit. The good effects of a liberal dressing of manure, and in most cases *ashes*, is no where so apparent as when applied to a poor scrubby orchard.

As a substantial element of food for many, as a valuable agent in preserving and promoting good health, and as a luxury which all classes may enjoy with a zest and a relish, "there is no substitute for the apple within the wide range of food for man." To the non-producer and to those to whom it is denied by climate, such gratification is unappreciated or unknown; and the same, to some extent, may be said of the peach. Both are devoured by most animals with avidity, and both are especially nutritious and fattening food for hogs.

"Good fruit upon the farm or in the garden may be justly regarded as the best indication that the agriculturist has been mindful of his duty to his family and himself, while he has been considerate in looking to the sure and liberal pecuniary reward which will follow the labors of the careful, industrious and intelligent cultivator. The growing of fruits is not only an attractive pursuit in which men become intensely enthusiastic, but it is profitable employment. Hence, under favorable circumstances, every desirable point for raising fruit should be speedily and thoroughly improved."

"If the Board of Health of large cities," says a judicious writer, "could have power to regulate the prices of fruits at certain seasons of the year, without establishing a bad principle or precedent, benefit would follow; and it would be a

grand thing to place in their hands a fruit fund for the purchase of fruits to be plentifully distributed among the poor. Good fruit, especially peaches and apples, during the latter part of summer, keeps the blood cool and prevents feverishness. The juices of fruits dilute the blood and keep it in a proper condition of fluidity, quite as well if not better than water. They also keep the kidneys in a high degree of health—a recommendation that cannot be given to any sort of artificial drink, not even to water, except it be pure and soft. It is well enough to disinfect streets and places with carbolic acid, chloride of lime, &c., but it would be better to stave off epidemics by making people too healthy to be assailed by them, and this, plenty of good fruit will help greatly to do.”

If “Agriculture is the nursing mother of the arts, and tillage and pasturage the two breasts of the State,” “*fruit culture*” must come in as furnishing a good supply of the nourishment. An esteemed writer, Col. John J. Werth, who has exhibited no little horticultural literature and good judgment, says, in an address to the Virginia Horticultural and Pomological Society:

“But while it is indispensable, under present discouragements, to offer directly profitable results in money actually received, to stimulate the zealous pursuit of any enterprise whatever requiring money, yet we would not be at a loss to find important encouragement for the cultivation of all fruits, small and large, for home consumption, by almost all classes who till the soil, if their value could be rightly appreciated as an economical and healthful, and, may I not venture to add, an elevating element of subsistence. There is good reason to believe that if our Southern people could be induced to limit their consumption of animal food, and proportionately increase their consumption of fruit, there would be a general prevalence of better health and more elastic temperament. It can scarcely have escaped the common observation of those who have mingled with other nations of the earth, at their own homes (or where they were congregated in sufficient proportions on other soils to encourage the indulgence

of their native tastes), that those communities of mankind who habitually subsist, to a large proportion of their diet, on animal food, are strikingly deficient in that activity and buoyancy and elasticity which mark the character of the vegetable and fruit-consuming classes. The difference is not all, nor nearly all, due to climate, as is generally supposed. The Spaniard and the Frenchman occupy nearly similar climates, and are very different in their temperaments. The former is the grosser feeder, and lacks the activity and elasticity of the latter. The Irish consume less meat than the British, and here again we find the vim and buoyancy of character largely predominant in the vegetable class. The Mexican and Central American have lived on beef until they are a mass of immobility, and have not the energy to pay the slight tribute of labor which their teeming soil demands for the abundant production of fruit and vegetables. And so on, through the various nations of the earth, I have no doubt that careful enquiry would establish the rule that energy and activity and elasticity of temper, and, consequently, a higher grade of rational enjoyment, are marked characteristics of those who subsist mostly on the lighter diet of fruit and vegetables.

“But beyond this, there is an urgent appeal, just now, arising from our peculiar condition and surroundings. We are not raising anything like meat enough, within the present arbitrary restriction of our State lines, to subsist our population; and, until something happens to enable the white men of the South to check the universal spirit of plunder which pervades the negro population, it is in vain to hope that we shall increase our domestic production of animal food. Here, then, we find a market at every man’s door for fruit and vegetables, to substitute the enormous consumption of meat, purchased from beyond our borders. And what is more certain, more economical, more healthful elements of subsistence are not to be found than are furnished under the various modes of preparation, which secure to us throughout the year all the large and small fruits of our climate, and which it is within the reach of all who have a few acres of land to cultivate and preserve.

“An eminent horticulturist of Massachusetts has practically found that pears, by carefully selecting a rotation of kinds as to their period of maturity, may be placed on the table every day in the year in their naturally ripened condition. But this extreme success is not necessary. It is only important to preserve in some form, the fruits of the summer and fall, until they are succeeded by the productions of returning spring. October finds us gathering grapes and apples and pears and peaches from the branch, and May renews the rotation with the strawberry crop.

“And as far as small fruits and the preservation of all kinds are concerned, we find an additional inducement to their culture in the adaptation of women and children to fill most of the employments involved in the pursuit. There seems to me, therefore, no sufficient reason why the small cottager should not, in Virginia and in most of the Southern States, as well as in France, surround himself with these healthy and delightful products of our soil; and high considerations of patriotism suggest that every inducement of precept and example, encouraged by the gratuitous distribution of trees, vines, plants and cuttings in a small way, should be held out to this class of our people, to invite them to this branch of horticulture.

“If there is anything in these considerations, they present encouragement to us to devote a share of our time and attention and labor to the culture everywhere, and by all, of some varieties of fruit, without stopping to enquire whether they will pay as an article of trade, if we can economically consume them at home. We commend this view of horticulture to the earnest consideration of the people of the South and other portions of our country; and trust that while we are active in seeking out and distributing information to encourage the vignerons and fruit-growers for market, we shall not forget, by ‘line upon line and precept upon precept,’ to enforce upon our people of all conditions and everywhere, to plant and *carefully cultivate* the best fruits adapted to their climate, wants and appliances.”

The great pleasure and profit arising from a choice collec-

tion of fruit is already becoming appreciated in our country, and especially in lower Virginia; and many orchards of fine fruit, judiciously selected, are now being cultivated in many portions of the State. Some are bearing fruit which would compare with that of any State in the Union, or perhaps in the world. Those who examined the splendid specimens of apples raised in the Valley of Virginia and exhibited at the late Augusta County Fair by Mr. Robert McCormick, Jones and others, will readily conclude that the Valley is the home of the apple, although in high flavor and aromatic juices, the Piedmont region may excel. Notwithstanding the severity of the drought of the year 1869, the exhibition of apples at the Virginia State Fair by those reliable and intelligent nurserymen, Messrs. Allan & Johnson and Franklin Davis & Co. and other gentlemen, was almost all that could be desired, as it regards size, flavor and variety; but the grand exhibition of the American Society at Richmond in 1871 surpassed any other display in fruit culture.

We wish to press this point, and recommend all who propose to plant trees to invest some little care and labor, *and a little money*, all to the amount of one dollar or less, for each young tree for the first year, and say twenty-five cents for each year afterwards, which would answer and not be extravagant. Trees thus attended to would soon realize a profit on the investment. In a very few years each tree would yield a profit equal to the interest of \$100 or \$200, and this interest-bearing fund would be increasing for a length of years, growing and maturing all the while, even while the farmers were asleep, abroad, or otherwise occupied.

In an address delivered some years ago before the American Pomological Society by Mr. H. F. French, of New Hampshire, we find the following suggestive remarks:

“The fact that this (apples) is the most profitable crop which can be cultivated among us, is well understood. It is a fair estimate in this part of the State (Exeter), that ten barrels of winter *apples* will generally sell for as much money as a ton of the best *hay*. *Hay* has been considered for many years the most profitable crop that can be raised for sale in

this section of the State, and it has borne a price, for ten past years, not upon the average above ten dollars per ton."

Mr. R. F. Williams gathered from an orchard *of one acre only*, the present year, from grafts set four years ago in very old and decayed trees, TWO HUNDRED BARRELS of first-rate Baldwin apples. This statement is more valuable as showing how readily old trees may be changed from producing worthless fruit to the production of that which is of the best quality, than as giving evidence of a remarkable product.

To show how long a time is required to bring trees from the nursery into bearing, I will give another statement, which is about a fair example of the success of good cultivation among us:

"John A. Lowe, Esq., of Exeter, set sixty trees about three years from the bud in his orchard in the spring of 1843, and forty more in the fall of the same year. They bore a few apples in 1847 and 1848. In 1850 he gathered six barrels; in 1851 twenty-one barrels; and in 1852 fifty barrels of fruit of the best quality."

A writer in the *New England Farmer* states that he knows "an orchard of *forty* Baldwin apples that yielded more than three hundred barrels of fruit of the best quality the past season, and about the same quantity in the season of 1850."

He says farther, "The ground about these trees has been kept in a perfectly pulverized state for half a dozen years or more, and manured like a garden." It should be borne in mind that the Baldwin usually produces every other year (unless highly manured).

It would be a fair estimate that fifty trees, which would stand upon an acre at the distance of about thirty feet apart, would produce an average annual crop of sixty barrels of apples, worth at least sixty dollars. It is not uncommon to see a single tree bear ten barrels of fine apples, and instances have occurred where *sixteen* barrels have been gathered at once from a single tree. At the lowest rate of product that any man in his senses, who has ever properly cultivated an orchard in this country, would estimate as a common crop, an

apple orchard will give *four times* as much profit as the same quality of land in grass or hay with less cost of cultivation.

In regard to the use of apples for stock, Mr. French says: "No accurate experiments have been tried by which the value of apples for cattle and swine has been ascertained. This, like so many other important agricultural questions, has been left to be guessed out by Yankee shrewdness.

"Most observing men believe now that apples of all kinds are very valuable for milch cows and swine. The general impression is that *sweet* apples are, for such purposes, more valuable than *sour*, although an analysis, I believe, shows little difference in their constituent elements. The opinion has been confidently expressed by intelligent farmers that sweet apples are of more value for stock than the same quantity of potatoes. The '*Green Sweet*' is, of all others, the apple to be cultivated for stock. Such food is not required till winter, and this variety will last till the 20th of May, which is pasturing time in this State."

If apples are proper food for stock in winter, they are equally proper at all other seasons; and where pasture and grass are scarce, they can be profitably used during summer and fall, especially for hogs, and they are of advantage to the orchard by consuming the defective and wormy apples as they fall, thereby aiding in the destruction of insects alike injurious to the fruit and to the trees.

We predict that soon a large and more regular trade will be opened for Southern fruit, independent of that raised for home consumption, and that no product of our soil can yield so liberal a return for the same amount of labor and capital as our crop of apples. Even at the low price of one dollar and fifty cents per barrel, which is lower than any price yet reached with us, the culture of this fruit pays twice, at least, the profit of any of our crops, including wheat or tobacco.

We quote further from Mr. French's valuable communication: "For reasons which are not easily understood, the apple seems extremely sensitive as to changes of climate. A variety which thrives well in New England often fails in New York, while the favorite apple of New York, the New Town

Pippin, cannot be raised in our part of New Hampshire." (The same rule applies farther South.) "A different list is, therefore, necessary for each locality, to be determined upon by careful observation of the actual success or failure of each variety." (*These lists we propose to prepare and include in this work, so that the farmer, with the advice of his nurseryman, may make such judicious selection of trees to suit his purposes and location, as may be desirable.*)

"In planting an orchard, regard should first be had to *home consumption*, so that the best variety of each *season* may be produced, and not a profusion followed by a famine."

In the preparation of lists of apples which have been *proved* in the *South* to be abundant bearers and of first quality, and which will probably, with such additions as every man will make, with two or three varieties, seedlings, perhaps, from the *old homestead*, which taste better to himself than any body else, be found a sufficient variety for market and for all useful purposes at home. "Except to the mere amateur, a great variety is a source of great trouble and little profit," whether intended for market or home consumption or both.

In a lecture by Dr. John A. Warder, of Cincinnati, delivered January 13th, 1868, we find the following appropriate remarks on the subject of fruit culture:

"Upon the present occasion, I propose to occupy your attention with a few general remarks upon the following questions:

"Why do not our farmers have a plenty of fruit?

"Why should not all who live in the country grow fruit crops just as they now produce grain, grass and live stock?

"The first question may be answered very readily, for most of those who have no fruits, *it is simply because they do not try to have them*; and this is the very natural result of their ignorance of the means of obtaining an abundance of those blessings upon almost every farm in the United States.

"The latter question may be answered by enumerating some of the great advantages of fruit growing. These are primarily the *health* of the families of the producers; where fruits are freely consumed upon the table at all seasons of the

year; next, the *pleasure* attendant upon their propagation, their culture, and above all, the satisfaction derived from the harvesting and consumption of these products.

“It is a well-established axiom in the medical profession, that the regular consumption of fresh, well ripened fruit, is conducive to health; and it is also a fact that the farmers of our country are not so *well fed* as they should be. This is no body’s fault but their own. True, they cannot have so great a variety of meats as those who reside in towns and villages, but they may enjoy the greatest profusion of fresh vegetables, and a succession of ripe fruits the year round, if they will but choose to take the trouble to plant and cultivate even a small portion as a garden and orchard.

“An appeal on behalf of fruit culture may also be made to the more sordid motive of money making. No crops that are produced from the soil yield so great profits. The productiveness of small pieces of land appropriated to fruit culture is truly wonderful, and the *money results* in some cases are so great as to be worthy of the fashionable term ‘fabulous.’ ”

One of the leading objects in presenting this work to the public, is to induce our farmers to direct more special attention to fruit growing. It has been, we think, fully demonstrated in the preceding pages, that fruit culture is to be an *occupation*, and a blessing, under Providence, to our people, and will materially aid in our recuperation from the damages and devastation sustained by the late war. The advantages as to good health, good living, good morals and pecuniary results that will be regarded as highly satisfactory, will all come in as inducements to our farmers to set out and cultivate orchards. Care in the selection of varieties of well-established merit, suitable for the location, comprising a selection that will insure a succession for the year round, is of the first importance; the earliest varieties being cultivated for market by those located in or near maritime districts and railroads leading to our large cities, especially to those north of us. *There can be no failure* if our farmers will avail themselves of the simple and cheap means within their reach, to surround

themselves with the beautiful scenery and rich rewards of teeming orchards. One of the fathers in horticulture says: "*If possible*, have a good orchard. When I say, I heartily desire that every man should cultivate an orchard, or at least a tree of good fruit, it is not necessary that I should point out how much both himself and the public will be in every sense the gainers."

In concluding these introductory remarks, the author begs leave again to be allowed to return his profound acknowledgments for the many favors of his correspondents in different parts of the South and of the United States, for their numerous suggestions and timely and valuable aid in compiling and writing this work.

The author also desires to say, that his attention has not been directed to the various and bulky compilations and quantity of materials within his reach, in order to deal in controverted theories, but rather to a *critical selection of facts*; and that this work has not been undertaken with a view merely to increase numerous volumes already extant of a similar complexion, but to furnish the more Southern and Western portions of our country with special and particular information suited more particularly to their soil and climate, no where to be found in contemporary or other authors, and to embody and present all the most useful, practical and well attested improvements, the result of more recent culture, observation and discovery.

Hoping from the advantageous circumstances in which the author is placed, and from his untiring efforts to produce a valuable treatise, the public will not be disappointed; that the spirit of improvement now abroad may extend to FRUIT CULTURE; that the hills and vales, fence-corners and waste places, as well as select places, may be adorned in spring with blooming trees and orchards, and in summer and fall with bending boughs laden with choice, luxuriant fruit for home and for market purposes, alike beneficial to the producer, the merchant, the consumer and the country.

ORIGIN OF THE APPLE TREE.

ITS PHYSICAL PROPERTIES, NATURAL HISTORY, HABITS, &c.

The Apple-tree, the common, or *Pyrus Malus*, L., (*Apple*, Sax., *Apfel*, Ger.,) a tree arranged by Linnæus under the genus *Pyrus*, it is too well known in this country to require a minute description. It frequently grows to the height of twenty or thirty feet, and produces a great variety of fruit. Botanists are of opinion, that the wildling crab-apple of the woods and hedges, is the original kind, from the seeds of which the apple now cultivated was first obtained.

The Apple-tree by cultivation has become indefinitely various and progressive, producing in a wild state, the small and bitter crab, and under high and successive cultivation, such fruit as the splendid Albemarle Pippin. The varieties of this species in this country, are now multiplied to some thousands in the different States; all having been accidentally procured from the seed or kernels of the fruit, or increased by the various modes of grafting upon crabs or any kind of apple stocks.

Notwithstanding the numerous sorts, it is believed that it would be best for all parties, that nurserymen should confine their stock to *forty or fifty varieties*; and having these well attested and adapted to the different regions, their different locations would enable them to furnish suitable catalogues for all parts of the country, and prevent the many vexatious failures and losses sustained by farmers and others, caused by improper selections.

The fruit of the Apple-tree arrives at full growth in successive order from June to the first of November, but comes to maturity only after gathering; and many of the winter kinds may be preserved until the next Spring.

The fruit of the wild crab tree of our woods and forest is flatish, about one inch in diameter, yellow when ripe, or of the color

of polished brass, and possesses an agreeable fragrancy. Perhaps no tree presents a gayer appearance in 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 color. It grows in woods and hedges, and flourishes better on declivities and in shady places than in open exposed situations or on boggy soils; its blossoms appear in the month of May.

This parent stock of all varieties of apples is well adapted as a stock for grafting, because its roots are neither killed by frost nor eaten by field mice; grass and even corn will grow beneath it. The wood of the crab tree is tolerably hard, turns clean on the lathe; and will receive a polish which renders it very desirable. The acid juice of the fruit is commonly termed *verjuice*, and is employed in recent sprains and in other cases as an astringent repellent. This fruit is eaten by horses, cows, sheep, goats, and particularly by hogs, which are extremely fond of it.

As this species quickly attains its growth, it deserves to form a part of every plantation; and we have only to regret that it is not more generally cultivated, as it will in a short time amply compensate the trouble and expense bestowed on setting it.

In dyeing, the bark of the crab-tree has been employed for forming a yellow and especially a citron color. Dambourney relates, that the dry shavings of this wood imparted a fine chestnut brown to wool prepared by a solution of bismuth. Turners and cabinet makers also use the wood.

Trees that come from Southern countries contain more aqueous juice than those that grow in the North, and trees from the South, when transplanted to a more Northern climate, are more liable to perish by frost. The remedy for this, is to deprive such trees of their leaves partially and gradually before they fall of themselves, so that by the beginning of Winter, the trees should be almost bare. This thickens the juices and renders them less liable to be injured by frost.

In cookery, apples are used in various ways and forms, constituting elegant table deserts. They may be sliced and fried in lard or after meat; they make fine pies and tarts, and the famous dowdy or family pie; may be made into excellent dumplings, sliced into puddings, boiled in rice, &c.; are fine roasted or baked; and the *apple butter* made from this fruit in the Valley of Virginia, East Tennessee, and in some of the Northern States is a delightful dish for any season. Dried apples keep well, and are a valuable article of trade.

As to the medical qualities of apples, consumptive persons have been greatly relieved, and even permanently cured by the persistent and regular use of this fruit in some form or other.

Apples serve as an excellent fruit for the desert, the kitchen and for making cider, brandy and vinegar; and stock of almost every kind thrive and fatten, when allowed free use of this most valuable of all fruits.

Concerning the physical properties of apples, it deserves to be stated, that besides their aromatic qualities, they are wholesome and laxative, when fully ripe. In diseases of the breast, such as catarrhs, coughs, asthmas, &c., they are of considerable service; for beneficial purposes, however, they ought not to be eaten raw, but either roasted, or stewed, or boiled; they also may be usefully employed in decoctions, which if drunk plentifully tend to abate febrile heat, as well as to relieve pectoral complaints. The author has himself found the use of *ripe* Apples and Peaches, both cooked and raw, a most admirable, convenient and palatable regulator of the bowels, and by their use has been happily relieved of chronic diarrhoea.

In treating of the general properties, as well as the relative salubrity of fruit, we shall in this place, only add, that the injudicious practice of promiscuously allowing it, whether ripe or unripe, to children and infants is very reprehensible, though their liberal use, when fully ripe, is rarely followed by any injury. On account of its acidity, they are not able to bear it in excess; and their digestive powers become too frequently impaired at the expense of other secretions; such

as insensible perspiration, and the discharges by stool, both of which are thus unnaturally promoted.

All fruit given to children should be given *perfectly ripe*. Mothers and nurses should likewise bestow especial attention to the cleanliness of the peels, which as they generally pass through different hands, or may have been stored in improper places, require to be previously wiped or washed.

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 possesses a most delicate flavor, 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 may 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.

While very young, no tree should be suffered to bear a full crop of fruit; and if they abound with blossoms, the fruit should be gathered as soon as formed; leaving only half a dozen of the produce, to ascertain the size and quality. By this measure, the trees will not only produce larger and finer fruit, but by being kept clear, the leading and collateral branches will every year become more vigorous. Nor ought any young plant or newly engrafted tree to be permitted to *run mop-headed*, as it will make no progress till each branch has acquired a determined leader, for, if the growth of a tree be prevented, it will be extremely difficult to throw such energy into the system, as to enable it to grow freely.

All vegetables in respect to their propagation are viviparus or

oviparus. The live progeny of vegetables consist of their buds, which rise on their branches in the bosom of each leaf, or on its long caudex extending down the bark of the trees, or which rise on the bulbs, knobs, wires, or scions, from the broad caudex on the roots of herbaceous plants. The egg progeny of vegetables consist in their seeds with the previous apparatus of the flower, and concomitant nutriment in the fruit and cotyledons."

Fruit trees are sometimes attacked by a disease called "crab," especially after transplanting them from the nursery: it destroys particularly the inner bark, by reducing it to a blackish powder, not unlike the smut in wheat.

Various conjectures have been formed as to the origin of this disorder which is often very destructive, especially to apple and pear trees; but none appear to us to be satisfactory. It is, however, very probable that it arises from the inattention of the gardener or orchardist, when transplanting young trees, by placing the Northern side of the trunk towards the South; where the powerful rays of the sun parch, and in a manner burn the tender bark which was grown on the north side. This change of situation to a different point of the compass may account for the disease, and the suspicion is somewhat confirmed by the circumstance, that the disease generally makes its first appearance on the south sides. It may also originate from injuries done to the tree, such as blows, scratches, &c. The remedy for trees thus affected will appear in its proper place.

Linnæus considers the apple and the quince as a species of the pear tree, or *Pyrus*, all the varieties of which are hardy and will succeed in any common garden soil, if planted in a free situation; they are propagated by grafting and budding upon any pear stock, occasionally upon quince, and sometimes upon white thorn stocks.

Apples of any kind may be reared in the manner above prescribed, and according to Dr. Anderson, the pure paradise stock is the best graft. They will not thrive, however, in a very low and moist soil, but a rich friable loam is best adapted to their health and rapid growth.

Mr. Forsyth in his treatise on fruit says: I have in numerous instances seen the stock have great influence on the fruit grafted thereon, in respect to bearing, size and flavor; 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 other in my orchard, yet are subject to the bitter rot, the original and well known affection of the fruit of the original stock.

Experience has fully proven that, although seedlings from apples will scarcely ever produce fruit exactly similar to the original, yet some of them will produce excellent fruit. Some will even be superior to the apples from which the seeds were taken. This fact shows that seeds planted from trees of a strong and rapid growth, and largest and best fruit, should be allowed to bear fruit before grafting, as they will seldom fail to bear good fruit, or at any rate, fruit of some good quality.

In reference to the latent powers of man and the soil, says a modern writer, "A kind providence has given man moral, mental and physical powers according to the circumstances of his existence, and placed him upon the earth, containing productive resources sufficient to maintain that existence. Within both are dormant energies requiring development and invigoration, for which man alone is responsible." It has been well said that he who makes one blade of grass grow where none grew before is a public benefactor. If so, how much greater is he that makes one healthy vigorous apple or peach tree bud, bloom and bend with its luscious load of grateful, health-giving fruit, where none grew before. In doing this work he finds the occupation pleasant, the time well spent, home made more attractive and pleasant, and all, with very little expenditure of money.

Trees are divided into two principal classes, namely, *fruit* and *timber* trees. The growth of trees is a subject of considerable importance; and as to fruit trees, but few accurate ex-

periments have been made, in order to ascertain their *annual* increase in height and bulk, and this would seem to be a difficult job, as so much depends on care and culture. In the Philosophical Transactions of the Royal Society for 1788, Mr. Barker states, as the result of his observations, that oak and ash trees grow nearly in equal proportions, increasing 1, or $1\frac{1}{2}$ inches every year. He remarks that when the annual growth amounts to 1 inch in height, a coat one-sixth of an inch in thickness will accrue to the tree.

The health and vegetation of trees may be greatly promoted by scraping them; by cutting away the cankered parts, and by washing their stems, at least once a year in the months of February or March, (and later in the Spring.) Hence Mr. Forsyth, (English author) in his ingenious treatise on "the Culture and Management of Fruit Trees," recommends fresh cow-dung mixed with urine and soap suds; and the composition to be applied to the stems and branches of fruit, forest or timber trees in the same manner as the ceilings of rooms are white-washed. This operation, he observes, will not only destroy the eggs of insects, that are hatched during the Spring and Summer, but also prevents the growth of moss, and if it be repeated in Autumn, after the fall of the leaves, it will kill the eggs of those numerous insects, which are hatched during that season and Winter; thus contributing to nourish the tree, and to preserve its bark in a fine and healthy state.

In common with other objects of vegetable creation, trees are liable to a variety of diseases, which, if not timely attended to, eventually destroy them. We shall in this place introduce a concise account of Mr. Forsyth's improved method of curing injuries or defects in either fruit or forest trees.

Mr. F. directs all the decayed, hollow, loose, rotten, injured, diseased and dead parts to be cut away, 'till the knife extend to the sound or solid wood, so as to leave the surface perfectly smooth; then, to one hundred gallons of human urine, and one bushel of lime, add cow-dung sufficient to bring it to the consistence of paint.

After having carefully brushed off all the moss, the infected trees should be anointed with this mixture, about the latter

end of March; which simple precaution it is said, fully answers the desired effect. The quantity of the composition may be made up to correspond with the quantity required for the trees to be anointed and made to the consistence of thick paint, and it should be laid on with a painter's brush to the thickness of one-eighth of an inch and the edges *finished off* as thin as possible. Next, five parts of dry pulverized wood-ashes should be mixed with one part of bone dust or ashes, and then put into a tin box, the top of which is perforated with holes; the powder must be sprinkled over the surface of the composition, being suffered to remain half an hour for absorbing the moisture, when an additional portion of the powder should be gently applied with the hand, till the whole plaster acquire a smooth surface. As the edges of such excisions grow up, care should be taken, that the *new* wood should not come in contact with the *decayed*; for which purpose, it will be advisable to cut out the latter, in proportion as the former advances; a hollow space being left between both, in order that the newly grown wood may have sufficient room to extend, and fill up the vacancy, so that it in a manner forms a new tree. By this process old and decayed trees have in the second Summer after its application, produced fruit of the best quality and finest flavor; nay, in the course of four or five years, they yielded such abundant crops, as young trees could not have borne in 15 or 20 years. By such treatment, likewise, large aged elm-trees, all the parts of which were broken, having only a small portion of the bark left on the trunk, shot forth stems from their tops, to the height of above thirty feet, within six or seven years after the composition had been applied.

Thus it appears, that both forest and fruit trees may be *renovated* and preserved in a flourishing state; while the latter may be rendered more fruitful than at any former period. We regret that our limits confine us to the present short account, and refer the reader to Mr. Forsyth's treatise above cited; which is illustrated with thirteen beautiful engravings.

Under the articles fruit, fruit trees, orchards, &c., some observations on these subjects will be given in the course of this

work, from the treatise of the ingenious Mr. Bucknal, and, on the present occasion, we will introduce some highly important remarks by the same valuable and practical writer.

ENGRAFTED FRUITS.

“Some friends have requested that I would introduce another paper on the nature of the valuable varieties of engrafted fruits, as they are of opinion that the essay in the 17th vol. of the *Transactions of the Society* is not sufficiently extended for a subject so important to fruit growers, and those interested in the production of fruits. As a proof of my willingness to make the orchardist as perfect as I can, I beg you to present my compliments to the Society, with the following elucidations.

“This is a subject in rural economy which ought to be much better understood than it is, in order to enable the planters to judge of the sorts proper to be planted, as an article of pleasure, profit, or recreation, as much of the credit of the plantation must arise from judiciously choosing trees of the best, new, or middle aged sorts, and not of the old worn-out varieties, which latter cannot, in the planting of orchards in common situations, ever form *valuable trees*, and must end in the disappointment of the planter.

“Engrafted fruits I have before said, and I now repeat, 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 endowed with the energies of nature, while the graft or scion is nothing more than a regular elongation, carried, perhaps, through the several repeatings of the same variety; whereas the seed from having been placed in the earth, germinates and becomes a new plant, wherever nature permits like to produce like in vegetation; as in the oak, beech, and other mast-bearing trees. These latter trees, from each passing through the state of seedlings, are perfectly continued, and endued with the functions of forming perfect seeds for raising other plants by evolution, to the continuance of the like species.

“This is not the case with engrafted fruits. They are

doomed by nature to continue for a time, and then gradually to decline, till at last the variety is totally lost and soon forgotten, unless recorded by tradition or in old publications.

“Reason, with which Providence has most bountifully blest some of our species, has enabled us, when we find a superior variety, to engraft it on a seedling or wilding stock, or to raise plants from layers or cuttings, or even to raise the roots, and thus to multiply our sources of comfort and pleasure. This, however, does not imply that the multiplication of the same variety, for it is no more, should last forever, unless the species will naturally arise from seed.

“Nature, in her teaching, speaks in very intelligible language, which language is conveyed by experience and observation. Thus we see that among promiscuous seeds of fruits of the same sort, one or more arise, whose fruits should be found to possess a value far superior to the rest in many distinguishable properties. From experience, also, we have obtained the power, by engrafting, of increasing the number of this newly-acquired tree; can change its country, give it to a friend, send it beyond the seas, or fill a kingdom with the fruit, if the natives are disposed so to do. Thus we seem to have a kind of creative power in our own hands.

“From the attention lately paid to the culture of engrafted fruits, I hope we are now enabled to continue a supposed happily acquired tree, when we can find it, for a much longer duration than if such variety had been left in the state of unassisted nature; perhaps I may say for a duration as long again, or something more. After these sanguine expectations, I may reasonably be asked, to what does all this amount? for here there is no direct permanency, . . . and why? The *why* is very obvious, . . . 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. I will allow they will 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 whence the seeds were collected.' The leaves also of those trees, raised from the same primo-genus 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. I intentionally used the word *actually*, because a resemblance may be found, though not much of that is to be expected.

"I beg that what has been last mentioned may not be taken as a discouragement to attempts for raising new varieties. I was obliged to speak very strongly, in order to place the culture upon its true foundation. I think it need not be observed, that there is no acquiring a new variety *but through the means of a seedling plant*; and, therefore, whoever wishes to succeed must attempt that way, or wait till others in their plantations may more fortunately produce it.

"In choosing seeds, that apple is most 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 their fruit well, or rather for cider, the small fruits are generally preferred for making the strongest, highest-flavored liquor. And from what I have been able to collect in the cider-countries, it is there the opinion that an apple something above the improved crab promises the best success. . . . This advantage also attends the practice: if there are no valuable apples raised from that attempt, these wildings will make excellent stocks to graft upon.

"Gentlemen who actually employ themselves in attempting to acquire new varieties, should remember that they ought to select all the sets, from the bed of apple-quick, whose appearance is in the least degree promising, and plant them together; at such a distance as to allow each to produce its fruit, which will happen in a very few years. My friend, Mr. Knight, who undoubtedly is the first in actual exertions for procuring these happily acquired new varieties, has had two plants bear fruit at six years and one at five. (In Virginia, apple trees will bear considerable crops at that age.) The cider districts have offered several premiums for securing new varieties, and some with good effect. Premiums have been given both to Mr. Knight and Mr. Alban.

“When the new variety is to be raised from a valuable *admired* apple, I would recommend the placing these seeds in a garden pot, filled with mould from an old melon bed; carrying the pot into a retired situation near the water, and giving attention to rear the plants to as large a size as is convenient within eighteen months. With this view, the pot should be placed in the green-house the first winter, or in a sheltered position; and, when the plants are afterwards to be set out in the spots, they should not be placed under the drip of trees, or much exposed to the winds.

“Two instances have been mentioned, the improved crab, and most admired apple; but prudence says, try all sorts, and something probably will arise; and the process is attended with little trouble or expense to a person who constantly resides in the country; yet, after all this scientific care, the apple may want flavor, and be in other respects nothing better than a common wilding.

“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 far 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.

“As an encouragement in attempting to increase the number of new and valuable fruits, we can prove that the Golden Pippin is native English. The Red Streak, a seedling of Herefordshire, if not raised, yet was first brought into notice by Lord Scudamore, and was for a long time called *Scudamore's crab*. The *Stire apple* was accidentally raised in the forest of Dean, in Gloucestershire, and took the name of *Forest Stire*. The cider made from this apple was the strongest the country ever produced, according to any living record. The Hagloe-crab, the best cider fruit now remaining, was discovered in the parish of Ecloe, on the banks of the Severn, and about sixty or seventy years ago; many scions were taken from this tree by Mr. Belamy, and engrafted on seedling stocks about Ross. These are now grown old; and to ascertain the age

of the variety, I went with Charles Edwin, Esq., to Eclose, in hopes of seeing the primo-genus of this family. The proprietor of the estate acquainted Mr. Edwin that it had ceased to bear, years ago, and was cut down. Those at Ross are but poor bearers now, and I shall suppose the variety must be one hundred and forty years old, though Marshal who wrote in the year 1786, mentions these trees were prolific, and he supposes the sort to be about 80 years old; but from present experience, it must be much more. The Tinton Squash Pear is of Gloucestershire; the Barland and Old-field were near Ledbury, Herefordshire. The two last pears clearly bear the names of the two fields where they were raised. The Barland fell about six years ago, visibly from weight and longevity, which was supposed to have been about 200 years. There have been many other names of estimation handed down to us, though the realities are now totally worn out, and have ceased to exist. Can any better proof be desired, that engrafted fruits are not permanent, than the regret we feel for the loss of these old valuable fruits.

“To making my paper short as convenient, I have dwelt only on the apple; yet all the engrafted fruits are under the same predicament of the seed not producing its like, and the offspring in time falling into nothingness of growth, and bearing, though that space of time must certainly depend on the natural longevity and hardiness of the sort, soil, position, care, &c. All these are more fully expressed in the papers published in the different volumes of the transactions of this Society, and the two volumes of the *Orchardist*, wherein the whole system is extended, to form a rational culture for the management of standard fruits.

“It should be remembered, that, as I am now alluding to the state of actual permanency, fifty years are to be counted as nothing; and, as often as we come to that point, we are compelled to resort to our first assertion: “That engrafted fruits are not permanent, they being continued from elongations, and not raised as a repetition of seeds. This is the only rational way, as yet introduced, of accounting for the loss of the valuable old varieties of fruits. Should a better

system be introduced, I shall readily adopt it : but this sufficiently answers the purposes of the planter.

“Some years ago, from due investigation and thorough conviction, I propagated this principle, and it was published in the 17th vol. of the Society’s Transactions, in the following words: “All the grafts taken from this 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. I do not expect a direct assent, neither do I wish it; for it should be taken with much reserve; but it is undoubtedly true.” These considerations should stimulate us in searching after new varieties, equal, or perhaps superior, to those of which we regret the loss.

“Observe that 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 into 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. (We would also remark that all young trees, when disposed to be valuable, in addition to the luxuriance exhibited in the leaves, buds and free growth, have soft, tender wood, offering little resistance to the pruning-knife, whilst the knife is apt to lose its keen edge when applied to seedlings of slow growth.) But from the time that the new variety or selected plant, compared with all the engraftments which may be taken from it or any of them, these shall show a most undeviating sameness among themselves.

“It is readily allowed, that the different varieties of fruits are easily distinguished from each other by many particulars, not only respecting their general fertility, and the form, size,

shape and flavor of the fruit; but also the manner of the growth of the tree, the thickness and proportion of the twigs, their shooting from their parent stem, the form, color and consistence of the leaf, and many other circumstances by which the variety can be identified; and where it is possible to engraft each variety upon the same stock, they would still retain their discriminating qualities, with the most undeviating certainty.

“The proper conclusion to be drawn from the statement in the last paragraph, is this, that were any to put the thought in practice, on a full grown, hardy or crab stock, it would produce an excellent proof that engrafted fruits are not permanent. For if twenty different varieties were placed together, so that each might 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 this business, would nearly be able to foretell the order in which each scion would actually 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 will 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 the least conversant with engrafted fruits know the advantage acquired from this circumstance. And here it is worth while remarking, that a Gascoyne or wild cherry, will grow twice the size that ever an engrafted cherry did.

“By an experiment 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 the engrafting is properly done and the engrafter chooses a new variety. Now the Ribstone Pippin of Yorkshire, is the

favorite, as being a free grower and good bearer, with fine fruit. This, however, may be certainly depended on, that when a new apple is raised from seed, if a scion were placed in a retired situation, and constantly cut down, as a stool in a copse-wood, and the apple never suffered to fulfil the intention of nature in bearing fruit, the practitioners of the following ages may secure scions from that stool, to continue the variety much longer. Hence, though I have written as much as is in my power against permanency, yet I have taken some pains to assure the planters, that forecast, selection, pruning, cleanliness, and care, will make the orchards turn to more profit for the rising generations, than what they have done for the last hundred years.

“To place the nature of varieties in its true light, for the information of the public, I must maintain, 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; and yet it is a well known fact, mentioned in the 17th vol. of the *Transactions*, that after the debility of age has actually taken possession of any variety, it will yet thrive by being placed against a southern wall and treated as a wall fruit. Who, however, can afford to raise cider at that expense as a matter of curiosity, to prove, that when the vital principle in vegetation is nearly exhausted, a superior care and warmth will still keep the variety in existence sometime longer?

“It should be understood that the external air of Britain is rather too cool for the delicate fruits, which is the reason why in the *Orchardist*, I lay such a stress in procuring warmth of the trees, by *draining, shelter* and *manure*. It would now be lost time to attempt to recover the old varieties as an article of profit.

“If I have not expressed myself in this essay *on the nature of varieties*, with as much clearness and conviction as might have been expected, it should be considered, that it is an abstruse subject, very little understood, and requiring at first some degree of *faith, observation, and perseverance*. The prejudices of mankind revolt against it. They are not disposed to

allow the distinction of nature; and they imagine, that, in the act of engrafting or multiplying, they give new life; whereas they are only continuing the existence of the same tree, stick or bud. Observe what I said before; the seed of the apple, when placed in the earth, germinates, and unfolds itself into a new plant, which successively passes through the stages of infancy, maturity and decay, like its predecessors. I might say all created nature is similar in this respect; though from the circumstance that varieties are much longer lived than man, the plants have appeared to be possessed of eternal powers of duration; nothing sublunary, however, which possesses either animal or vegetable life, is exempt from age and death.

“Within the last twenty years I have travelled many hundred miles, and conversed with the most intelligent men in each country; and I now want to convince mankind for no other reason than because it is their interest so to believe, that there is in creation an order of beings (engrafted fruits) so formed, that we have the power of multiplying a single variety, to what number of trees we please; that the first sets arise from a small seed; that the next and descendant sets are propagated by engraftings or from cuttings, layers, &c.; and, although these trees may amount to millions, yet, on the death of the primo-genus 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. I say they shall gradually begin to decline; and in the course of time, or of centuries, to those who would prefer that expression, the *whole variety* will scarcely have a single tree remaining to show what the fruit was. Let those who are not disposed to assent to the statement, ask themselves what has become of the old lost varieties? did they die, or did malicious men cut them up?

“I, who am firmly convinced of the truth of what I have advanced on this subject, have no doubt but that the same would happen by engrafting on the oak or beach, if the mast raised from the engrafted tree did not produce the like; for there the question turns.

“Is it not known that the woodman, in setting out his sapling oaks, always selects new seedling plants, and never continues one upon an old stool; and, if he should so blunder, that tree, from the stool will never have freedom of growth, nor the size or firmness of timber equal to the new raised plant.

“I wish I could persuade my friends, that with the same attention with which the woodman acts, the planter is to raise his orchard from the young fruits which thrive in the neighborhood, or are in health and full bearing in the country from whence they are to be brought.

“The fruit grower should look to selection, cleanliness and care. To me it is a circumstance perfectly indifferent, whether he is to use Mr. Forsyth’s composition or Mr. Billingham’s boiled linseed oil, or my medication. I only maintain that the wounded parts of trees want something to destroy the insects and vermin, and heal the wood, from which the trees are kept in health.

“Let those who are blessed with fruit plantations, attend to their preservation, and not leave them to the state of unassisted nature.”

PROPAGATION OF FRUITS.

PROPAGATION, in general, signifies the act of multiplying the kind or species; but, in this place, we propose to treat only of vegetable nature.

Beside the usual modes adopted by the gardeners and agriculturists of propagating trees, shrubs, &c., there are two other methods of multiplying plants, in a manner equally novel and surprising.

1st. PLANTING THE LEAVES was accidentally discovered by J. F. Henry, a German, who died at Angsburg, in 1726. He reared many large trees, by setting healthy leaves in flower-pots containing sifted garden mould, so that one third of the leaf was covered with earth. Over these pots he suspended vessels filled with water, which gradually dropped upon the small plants beneath; thus, the young stems began to strike root and grow like those reared from kernels.

2nd. BY COVERING HORIZONTAL SPRIGS, OR BRANCHES WITH MOSS.—This ingenious method of multiplying plants was announced by J. C. Wendland, an eminent gardener in Germany, who described it for the benefit of the public nearly in the following words:

“Such shrubs as cannot conveniently be propagated by seeds, sets or by layers, may be easily multiplied, especially if they have young branches near their roots. For this purpose, the earth around the stem ought to be previously loosened, elevated, and made nearly level with the lowermost sprouts: these should next be laid on the ground horizontally, (without cutting or breaking them,) then fasten with small wooden hooks; covered with moss; and frequently watered, so that the latter may closely attach itself around the branches. The operation may be performed either in the Spring or Autumn; if in the former season, the moss should never be suffered to become dry; if in the latter, it must be covered with straw to protect the layers from the effects of frost.”

When the moisture has softened the rind of the sprouts, young roots will strike through the moss into the soil, and numerous plants may thus be obtained in the course of one Summer sufficiently vigorous to be removed to the nursery. No biennial parent-branches, however, need be employed; as these will produce new saplings only in the second year.

PROPAGATION BY SEEDS.

PROPAGATION by seeds is the natural and easiest way to rear trees and most other vegetable productions; but few species of fruit trees, however, will produce the same variety and quality from the seeds or kernels, and the greater part will prove very inferior and crabbed fruit: some, notwithstanding, will be very good, and a few may equal the parent in every respect, and bear a general resemblance in growth, foliage, &c. There are a few varieties of peaches, however, that may be reared from the kernels, with most undeviating sameness, especially the different varieties of the Heath. Propagation by layers or cuttings is not, and cannot well be practiced in rearing the Apple or Peach and the various modes of budding and grafting are resorted to for that purpose.

PROPAGATION BY BUDDING OR INOCULATION.

BUD, in botany, is the embryo or rudiment of a plant, growing on stems and branches of trees, and covered with scales, or with a resinous varnish, to protect it from the winter cold, and from the depredations of insects. Buds proceed from the extremities of the young shoots, and along the branches, sometimes single, sometimes two by two, either opposite or alternate, and sometimes collected in greater numbers. In general we may distinguish three kinds of buds; the leaf-bud, the flower-bud, and that containing both in one covering. The first species contains the rudiments of several leaves, which are variously folded over each other, and surrounded by scales. The second species or flower bud, contains the rudiments of one or several flowers, folded and covered in a similar manner. This is called the eye of the bud.

The third sort, which is the most common of any, produces both flowers and leaves. Buds, together with bulbs, which are a species of buds generally seated on or near the root, are termed *hibernacula*, a term signifying the winter quarters of the embryo shoot.

As plants are supposed to bear a striking analogy to animals, they may not improperly be reckoned both viviparous and oviparous; in which view seeds may be considered as vegetable eggs, buds as living fœtuses for infant plants, which renew the species as certainly as the seed.

As each bud contains in itself the rudiments of a plant, and would, if separated from its parent vegetable, become in all respects similar to it, *Linnæus*, to shew the wonderful fertility of nature, has made a calculation, from which it appears that in a trunk scarce exceeding a span in breadth, no less than ten thousand buds may be produced. How great, then, must be the number of plants which are capable of being raised from one large tree?

The flower-buds of many trees, says Dr. DARWIN, arise immediately from the terminating shoots or spurs of the preceding year, and are either accompanied with leaf-buds, or separately, as in apple and pear trees. Others proceed from the shoots of the present year, alternately with leaf-buds, as those of vines, and form the third or fourth of the new shoots. They differ from the leaf-buds, because they perish when their seeds are ripe without producing any addition to the tree; the leaf-buds, on the contrary, decay in autumn, and their condexes are then gradually converted into alburnum or sap-wood, over which the new leaf-buds shoot forth their condexes and radicles, or insert them into it, and gradually fabricate the new bark and root fibres.

LEAVES, in botany, are defined to be the organs of motion, or muscles of a plant: they constitute the lungs of each individual plant.

BUDDING is a mode of propagation not only applicable to fruit trees, but to ornamental trees and shrubs, including the rose, and there are some fruits that can scarcely be multiplied any other way. It consists in removing a bud with a portion

of the bark from a tree and inserting it in a slit of the bark of another tree. The season for performing this operation is July and August, or September will answer for peaches, and is early enough for most Southern latitudes, when the buds destined for the following year are completely formed in the axils of the leaves, and when the portion of the bark parts freely from the wood beneath; the buds to be preferred being those on the middle of the shoot. There are many forms of budding, but that which is the simplest and most easily performed need alone be described or practiced.

The buds upon the last year's growth will produce young shoots, while those of the second year's growth are apt to be blossom-buds, and will not make twigs.

Budding is regarded as a modification of grafting, and is performed while the stock is in vigorous growth.

MODE.—“The operator should be provided with a budding-knife, in which the cutting-edge of the blade is rounded off at the point, and having a thin ivory or bone handle, like a paper folder, for raising the bark of the stock. A horizontal or transverse incision is made in the bark, quite down to the wood, and from this incision a perpendicular slit is drawn downward to the extent of perhaps an inch. The slit has now the resemblance of the letter T; a bud is then made ready, or is cut from the tree that is wished to be propagated, having a portion of the wood attached to it, so that the whole may be an inch and a half long. The bit of wood is then gently withdrawn, care being taken that the bud adhere wholly to the bark or *shield*, as it is called. The bark on each side of the perpendicular slit being cautiously opened with the handle of the knife, the bud and shield are inserted; the upper tip of the shield being cut off horizontally, and brought neatly to fit the bark of the stock at the transverse incision. Slight ties of moistened bass or candlewick are then applied, and in about a month or six weeks these ligatures may be removed, when, if the operation has been successful, the bud will be fresh and full, and the shield firmly united to the wood; the next Spring a strong shoot is thrown out from this bud, and to this the stock is headed down in the course of the Summer.



The stock (the next spring as the buds begin to unfold, up to the time the leaves are half-grown) should be cut off to within two or three inches of the bud, and, when the bud has grown up some inches and inclines from the stock, tie it to the stump. All sprouts must be kept off, and in the early part of July, in this latitude, cut off the stump even with the budded stock or sprout that has grown up, as at *a*. See cut.

PROPAGATION BY GRAFTING.

In gardening, the term Grafting (*Greffer*, Fr.) signifies the taking a shoot from one tree and inserting it into another, so that they may closely unite and become one trunk—the graft bearing its own fruit, being sustained and nourished by the sap of the stock or tree into which it has been inserted. When thus united, the shoot, branch, or scion, determines the kind of fruit.

Grafting has been practiced from the most remote antiquity; but its origin and invention are differently related by naturalists. The great aim of this useful art is, to propagate valuable and curious sorts of fruit trees; to insure the growth of similar kinds, which cannot be effected by any other method: for, as all the good species of fruit have been accidentally obtained from seeds, many of these, when sown, will degenerate and produce bad fruit. But when shoots are taken from such trees as bear good fruit, they will never change their kind, whatever be their stock or the tree on which they are grafted.

Mr. Bradley observes, “that the stock grafted on is only to be considered as a fund of vegetable matter which is to be filtered through the scion, digested, and brought to maturity, as the time of growth in the vessels of the scion directs.” A scion, therefore, of one kind grafted on the tree of another may be rather said to take root in the tree on which it is grafted, than to unite with it; for it is obvious that the scion preserves its natural purity, though it be nourished and fed by a mere crab.

The experience of Mr. J. Cooper, of New Jersey, is opposed to this generally adopted theory. He says, "experience for more than fifty years has convinced me 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 superior to the apples from which the seeds were taken. This fact has led me to plant seeds from the largest and best kind of fruit, and from trees of a strong and rapid growth; and to let all young trees bear fruit before grafting, which produced an uncommon, strong shoot, or large, rich-looking leaf. . . . I have seldom known them fail of bearing fruit having some good quality; at all events, they make a stock to put any good kind on, which may afterwards present itself."

In grafting or budding apple trees, it is best to perform the operation within or near the earth, of such kinds as produce an erect, strong stem; but on such kinds as incline horizontally, or on small, weak shoots, the preferable mode is, to insert the bud or graft high enough to form a top.

"I have, in numerous instances, seen the stock have *great influence on the fruit grafted thereon* in respect to bearing, size, and flavor; 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 bitter rot, the original and well known affection of the fruit of the 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 have 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."

The grafts or scions with which the operation of grafting is effected should be of the last Summer's growth, from the outside branches, firm and well-ripened, and selected from healthy,

vigorous trees. The graft is always the *middle part* of each shoot, cut to five or six inches in length, or so as to have four or five good eyes, or buds, but should be preserved at full length till grafting time.

The proper tools and other materials used in grafting are :
1st. A strong knife for cutting off the heads of the stocks previous to the insertion of the graft ; also a small *fine toothed* hand-saw in good order, for occasional use, for cutting off the heads of large stocks. 2. A common grafting-knife, or sharp, strong pocket-knife, for cutting and shaping the grafts ready for insertion ; also to slope and form the stocks ready for the reception of the scions. 3. A flat grafting firmer or chisel, with sloping basils, and small mallet for clefting large stocks. 4. A quantity of new bass strings, candlewick or other pliable stuff for bandages for securing the grafts when placed above the earth, and promoting their speedy union with the stock. 5. A quantity of clay for applying closely round the grafts after their insertion and binding, to defend the parts from the influence of the sun, winds, and wet weather (this plaster is applied to grafts at the surface of the earth). According to Mr. C. P. Renolds, of Rochester, N. Y., a very good wax for grafting may be made with two pounds of resin, one pound of beeswax, and one pound of tallow. They should be melted together, poured into a tub of cold water, and worked with the hands, until soft and pliable, and as light colored as possible, as dark wax is more liable to melt in the Summer's sun and run off.

Some recommend using linseed oil in the place of tallow, but I think it makes too dark-colored a wax.

Another grafting plaster or mortar that answers an excellent purpose, is prepared of strong fat loam ; or any other tough clay, to which may be added a fourth part of fresh horse-dung, free from litter, and a small portion of fine hay, cut, or hair, and a little water, well mixed : the whole should be properly beaten with a stick, and thus well incorporated.

This operation should be repeated according to the nature of the clay, and performed several times during the first day ;

the composition being still moistened with water for six or seven days successively, at the end of which time it will be fit for use.

There are various modes of engrafting, which are termed whip-grafting, or tongue-grafting, crown-grafting, saddle-grafting, root-grafting, check-grafting, side-grafting, and, lastly, grafting by approach or inarching. Besides this last mentioned, the following are the most commonly and successfully practiced.

1st. *Whip-grafting* or *tongue-grafting* is generally performed *in nurseries*, upon small stocks, from a quarter of an inch to a half or a whole inch in diameter: The stock, scions or grafts, should always be of the same size, or approach as near to the same size as possible. 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 *tounging* or *tipping*; that is, by making an incision in the bare part of the stock downward, and a similar slit in the scion upward; after which they are to be carefully joined together, so that the rinds of both may meet in every part, when a ligament or bandage of bass or candlewick is to be tied round the scion to prevent it from being displaced, and the whole is to be covered over or coated with the clay above described.

Another description of this mode we copy, being an excellent article from Affleck's *Farmers' and Gardeners' Almanack*:

“Although it is better for a farmer to go to a nursery, and there select the young trees he may require, yet every one ought to have a knowledge of grafting and budding—with this view, a sketch descriptive of the process has been prepared, and is here offered :

“Stocks for grafting or budding are produced either by sowing seed, or from layers, suckers or cuttings; but the stock must be of the same natural family as that to which the graft belongs, or have a close affinity to it. To use others—as the sycamore for the pear and apple, the walnut for the peach, &c.—may do as a matter of amusement or experiment, but

can be of no permanent and real advantage. In grafting, mere propagation should not be the only object, for, to secure a permanent union between the stock and graft is of far more importance. For apples, seedlings of the apple and crab. Pears, those of the wild species or of the quince. Plums, seedlings of the common or wild plum. Cherries, seedlings of any free-growing wild variety. Peaches, on the stock raised from the seed. The apricot and nectarine, the larger sort of plums.

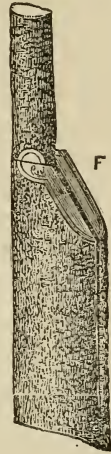
“The season for grafting may begin by the middle of March and continue until the end of April; the grafts being cut into lengths of four or five buds each; the knife to be thin, small, and keen-edged. Cut off the head of the stock and the base of the scion at a corresponding angle, so as to form, when put together, a neat splice; the tip of the stock, if larger than the graft, is to be cut off horizontally. Next a slit is made downwards in the centre of the sloping cut in the stock, and a corresponding slit upwards in the face of the scion; in applying the scion to the stock the tongue formed in the base of the former is inserted into cleft of the latter, and so fitted that the inner bark may unite *neatly* and *exactly* on one side; the splice is then to be tied, or covered with clay or waxed bandage.

“CLEFT AND ROOT GRAFTING.—Other methods might be mentioned, but it will suffice for our purpose to include cleft and root grafting: the former being adopted where the stock is larger than the graft, when the head of the stock is cut off and a perpendicular slit made, D, the scion being sloped on both sides, C, and inserted like a wedge into the cleft of the stock as at F. Root grafting is performed on a root a little thicker than the graft, and the more fibrous the better; a quantity of them may be procured in the fall and packed away in sand or earth in a cellar; those from young, thrifty trees being most desirable; and, when grafted, they may be packed away in earth in a cellar until spring, when they may be planted out in nursery rows.”

We will here give another description of *cleft-grafting* or *slit-grafting*, as gardeners differently term it, so practical and

Cleft and Root Grafting.

C



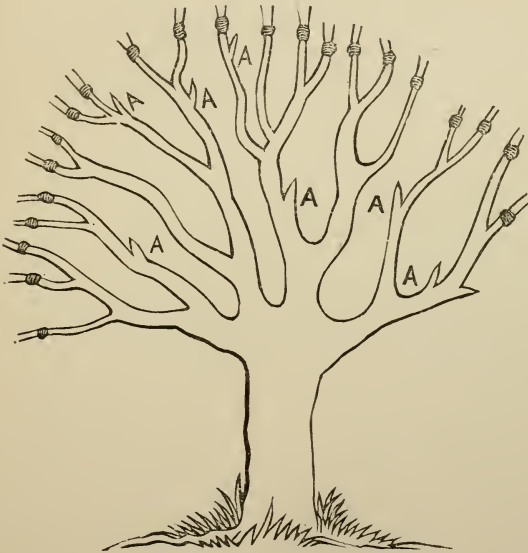
plain that any farmer may perform the operation without the least difficulty: It is performed upon stocks from one to two inches in diameter. The head of the stock being carefully cut off in a sloping direction, a perpendicular cleft or slit is to be made about two inches deep, with a knife or chisel, towards the back of the slope, into which a wedge is to be driven in order to keep it open for the admission of the scion; the latter must now be cut in a perpendicular direction, and in the form of a wedge, so as to fit the incision in the stock. As soon as it is prepared it should be placed in the cleft in such a manner that the inner bark of both the stock and scion may meet *exactly* together; two scions may be inserted if the stock is large. It is then to be tied with a ligature of bass, cotton-wick, or other pliable bandage, and clayed over, as is practiced in whip-grafting, three or four eyes being left in the scion uncovered. The proper season for this mode of grafting is the same as the preceding, viz: February and March, although it will answer all through April. Towards the latter end of May, or beginning of June, the junction of the graft and stock will be completed, and the latter begin to shoot; when the clay may be taken off, and, in the course of a fortnight or three weeks, the bandages may be removed.

“*Extreme branch-grafting*,” or grafting over the top of an old tree, is a very great acquisition to those who take pleasure in cultivating good fruit. The process is copied from the Trans. Soc. Arts, London, and is as follows:

“Cut away all the spray wood, and make the tree a perfect skeleton, leaving all the healthy limbs; then clean the branches and cut the top of each branch off, where it would measure in circumference from the size of a shilling to 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 other, 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 an 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 trees being thus prepared, put in one or two grafts at the extremity of each branch; and put on the cement described below, and tie it with bass or soft strings. . . . Do not sever all the shoots, as, in case the grafts do not succeed, they may be wanted to re-engraft the next Spring. Additional grafts may be inserted in the sides of the branches, as at A, A, A, A, A, A, or where they are wanted to form the tree into a handsome shape.



Cement for Grafting.—One pound of pitch, ditto resin, half ditto beeswax, quarter ditto hogs lard, quarter ditto turpentine, to be boiled together, but not to be used until you can bear a finger in it.

It is objectionable to graft at short distances from the trunk or body of a tree, as the wounds are so large as to require several grafts, which cannot firmly unite and clasp over the stumps, and consequently these wounds lay a foundation for after decay; or, else, they diminish the growth of the tree,

whereas, upon this plan, they will be larger in three or four years, than before the operation. The annexed cut will give an idea of this plan to give a new top of superior fruit bearing branches to a tree, even if old and decayed.

The following "*new mode*," as it was called, 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 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.

The theory of grafting has been explained thus: "It is the inoculation of the vessels of the graft with those of the bark and alburnum of the tree, to which they are applied and bound.

"In grafting, it is necessary to apply the bark which contains or consists of the caudex of the young scion, exactly to the bark of the branch into which it is inserted or applied; and then all species of grafting succeeds, whether by excision or inoculation, or inarching. But I suspect where a single bud is inoculated, it has often failed from the operator having selected a *flower*-bud instead of a leaf-bud; which probably unites its caudex with those of the stock with less vigor, and certainly dies, after it has ripened its seed; or, by holding the bud in his mouth as he ascends the ladder, or while he makes the incision, and thus destroys it by heat, as I once observed. A *leaf bud* may in general be distinguished from a *flower bud* by its being sharper, pointed, and less spherical.

Cleft grafting is sometimes performed in the following simple manner, "You may cut, at or a little below the surface, any cion whose root is unconnected with the mother stock, and make a split in the stump, and sharpen your graft

in the same way, and open the split and set it in the stump, *but not perpendicularly*—the last process, perpendicular, is so apt to miss taking the sap; but if you set your graft cross or quartering, you cannot miss. You will be careful to cover it with fine earth two or three inches deep, and you may depend on success.”

ROOT GRAFTING may also be successfully performed as follows:

“When you commence grafting, you have nothing to do but dig around the root of the tree, in whose root you intend to set—when you find a root half an inch in diameter, cut it loose from its mother and raise the outer end of it a little, so that you can make a split in it about an inch or more from the end—then sharpen the graft just at the joint, with one side a little thicker than the other, and open the split end of the root—cover it even at the surface with fine earth, and it will sometimes grow to the height of six feet in one Summer.

GRAFTING STONE FRUITS.—To be successful, the grafting of stone fruits must be done very early. The cherry needs to be grafted earlier than the plum, and the operation must be performed on both before the buds begin to swell. The peach will succeed by root grafting, if carefully done early in the Spring. It may be grafted in the usual way with some success.

AFTER MANAGEMENT.—In grafting, when the top of the stock is off, it is best not to rub off all the suckers as they are produced, and thereby thwart nature in her efforts to renew the lost top. Large stocks may suffer for want of sufficient top, if all the sprouts are cut off and kept off. Yet suckers must not be permitted to divert too much of the sap from the scions. It is best, after the scions have been well established, to cut or rub off the suckers occasionally, or *spurr-in*, that is, reduce a portion at a time, so that the scion may not be impoverished. Old trees, when grafted, should be deprived of all suckers that crowd or interfere with the scions, but small twigs of the old wood should here and there be left until the next year or second season. This will aid in sustaining the vigor of the stock and the health and luxuriant growth of the scions.

GRAFTING CLAY.—Take equal quantities of pure clay and fine fresh horse manure—if the clay be too strong, add a little sand—apply a ball of the mixture to the stock, completely covering it. It is kept in its place and supported by winding around it strips of old cloth, tow or other bandage. The composition will work well with less horse manure, and, by adding fine hair, or, pure clay alone will answer if properly bandaged, in case it is not convenient to prepare grafting composition. It is, however, more troublesome to apply, and no surer than the wax composition.

GRAFTING OLD ORCHARDS.

The following treatise, by C. P. Renlods, Rochester, N. Y., written for that popular and valuable periodical, “*The Rural Annual and Horticultural Directory*, Joseph Harris, Rochester, on grafting old orchards, is deemed worthy of a place in this work.

“There are but few old orchards in the country that do not contain some trees which are decidedly unprofitable. Some bear small, sour, natural fruit, only fit for cider or swine; others are grafted to poor varieties, or are shy bearers, or the variety may be good generally, but may not succeed on some soils or localities. Thus for various reasons nearly every orchard contains some trees that bring but little good fruit to the farmer, and he feels that, unless some improvement can be made, they may as well be cut down and no longer cumber the ground.

Now, if a tree is healthy and thrifty, it would be unwise to destroy it, for it has a foundation of roots, and a structure of trunk and branches, that it would require many years for a young tree transplanted from the nursery to attain to. If we can only substitute for that inferior, nearly worthless fruit, fine, excellent, productive fruit, it will be far better than to destroy the tree. The science of grafting affords the means of changing that fruit within a few years.

If a bearing tree produces tolerable, fair-looking, saleable fruit, although not of the first class, it would be impolitic to graft it over, for it would require several years before the

grafts would bring in so large an income as the old kind, and there is some risk to run in grafting over an old tree. The grafts may fail, or the tree itself may die in consequence of cutting out so much of the top.

It is to afford some suggestions how to avoid failure in grafting that this article is written."

THE TIME FOR GRAFTING.

We prefer grafting apple trees as early in April as the wax will work freely. If the work is properly done, no subsequent freezing will injure the grafts. I once grafted an orchard in the early part of April, and about the middle of the month the ground froze up quite solid, but the grafts succeeded remarkably well.

GRAFTING WAX.

A very good wax for grafting may be made with 2 lbs. of resin, 1 lb. beeswax and 1 lb. tallow. They should be melted together, poured into a tub of cold water, and worked with the hands, until soft and pliable, and as light colored as possible, as dark colored wax is liable to melt and run off in the Summer sun.

Some recommend linseed oil in the place of tallow, but I think it makes too dark colored a wax.

GRAFTING.

The first operation in grafting is to saw off the limbs to be grafted, and this is a very important part of the operation.

It is desirable to have the new top as low as possible, and many are induced to saw off large limbs as near the trunk as practicable in order to secure this end; but it is very liable to result in the failure of the grafts and the speedy death of the tree. The end of the limbs will die first, and decay will soon extend down to the roots. *Never saw off a limb more than two inches in diameter, and but few of that size.* The safest way and the one most certain of success, is to allow the larger limbs to remain and graft their lateral branches,

thus, without elevating the top much above the original one, you graft only small limbs. A fine sharp saw should be used, so as to make a smooth cut and do the work neatly. Care should be used to hold the limb with one hand, while sawing it off with the other, otherwise it may peel down on the under side. Some three or four inches of the stump of each limb should be left to graft. It is a good plan to graft only a part of the tree the first year, selecting the most thrifty limbs, and taking two or three years to complete the tree.

CUTTING AND PREPARING THE SCIONS.

The scions should be of the past year's growth, cut from the outside limbs of a tree any time during the suspension of growth, but February or March is considered the best time; tied up in bundles, carefully labelled, and laid away in the cellar in slightly moistened sand. An expert will cut the grafts at the time of grafting with success, but it is best to cut them before.

Two buds should be left on every graft and using a sharp knife cut it to a wedge shape, leaving the side the lower bud is on a little thicker than the opposite one, so that the bark of the stock will be certain to press on the bark of the graft, *and the bark of each should exactly meet.*

SETTING THE GRAFT.

With a grafting chisel, or an ordinary one, split the stock down about two inches, drive in a small wedge of wood or iron to keep the cleft open, until the scion or scions are inserted; set the scions so that the lower bud will be just inside the cleft, and the bark of the stock and scion join at the same point, as at this junction the sap flows from the stock into the graft, and withdraw the wedge. Where the stock is from one and a half to two inches in diameter, it is well to insert two scions, and in case both grow, *the weakest should be smoothly cut off three' or four months afterward.* The wax should be immediately spread on, so as to cover the end of the stock and its clefts,

thereby excluding air and water. Spread it on pretty thick, for it is poor economy to be too saving of wax, if resin and other materials are very high. It is necessary to grease the fingers to prevent the wax adhering to them.

AFTER TREATMENT.

As soon as the growth commences in the grafted tree, the sap which formerly flowed through the severed limbs, will seek new channels, and numerous suckers will start in the vicinity of the grafts. These should be carefully rubbed off once a month.

In case the grafts in any of the limbs fail, one or more sprouts should be allowed to grow, to be grafted when of sufficient size.

An old tree, thus grafted over, will come into bearing several years before a young tree transplanted at the same time, and bear much heavier crops.

VARIETIES.

In selecting varieties to graft, a somewhat different selection would be made for a market orchard from what would be desired for home supply.

If for market, a few only of the most productive varieties in the neighborhood, and the most saleable should be chosen. Other things being equal, a red apple always sells better than a green or yellow one, as buyers are influenced a great deal by the looks of the fruit. An orchard of *Baldwins*, in most localities, will probably yield a greater profit than almost any other variety, and a *Greening*, from its well known character, is always in demand.

If an orchard is located near a large city, Summer apples often pay very well. The *Early Harvest*, *Red Astrachan*, *Early Joe*, *Primate*, *Sweet Bough* and *Golden Sweet* are the best Summer varieties for New York State, either for market or home consumption.

Among autumn varieties, the *Gravenstein* deservedly ranks first; the *Detroit Red*, or *Black Detroit*, is a large, product-

ive and excellent variety; the Maiden's Blush, is a handsome yellow apple, with a *blush*, rather above medium size, and productive; Wine, or Hays, a large striped handsome apple, of excellent flavor, I have found one of the best and most productive of late Autumn varieties, and it would command the highest price in any market.

For Winter, in addition to the Baldwin and Greening, already mentioned, the Spitzenberg, where it succeeds well, is a good variety and meets with ready sale; it is a long time coming into full bearing, but, when once established, is a good uniform bearer; the Tompkin's County King is bearing the test of experience very well, and bids fair to take a high rank among Winter apples; the Peck's Pleasant, a green apple, becoming yellow, with a red cheek, as it ripens, is a good and productive variety for late Winter.

The above varieties would form a very good selection for Western New York, and with a few variations would be well adapted to many other parts of our country.

PEARS—OLD WORTHLESS TREES.

We have thus far spoken only of apples, yet nearly every old orchard or fruit yard has a number of old worthless pear trees, producing either bitter, astringent, natural fruit, or unprofitable grafted varieties. How many trees of the once unsurpassed Virgaliere are left standing about the country, producing from year to year nothing but miserable cracked fruit. Man has not yet become wise enough to devise a remedy for this disease which affects several of our better pears; so I suppose there is no other way than to substitute some other varieties for those so diseased. Happily, our list of good pears is becoming quite extensive, and there is no excuse for retaining an old favorite that has become worthless. In Summer we can enjoy such varieties as Doyenne d'Ete, Dearborn's Seedling, Tyson, Rostiezer, and Beurre Gifford; in Autumn, the Bartlett, Flemish Beauty, Seckel, Belle Lucrative, Duchess d'Angouleme, Louise Bonne, Sheldon, Beurre d'Anjou, Beurre Diel, Beurre Clairgean, and Law-

rence; and in Winter, Vicar of Wakefield, and in some localities, Glout Morceau, and Easter Beurre, although I am of opinion that we are yet without a *really good* Winter pear.

Pears generally bear grafting well, and will soon repay all outlay. They should be grafted a little earlier than apples, and in the same way.

GRAFTING AND IMPROVEMENT.

The address of J. R. Williams, Esq., before the Kalamazoo Agricultural Society, Michigan, contains much good sense. The following remarks on the ease with which every man may improve the quality of his fruit are applicable to the latitude and meridian of other places besides Western Michigan:

“As it is with animals and vegetables, so it is with fruits. You can have stunted, astringent, crabbed fruits, or the most delicious. The precaution to send your neighbor’s boy to snip a shoot from a fine tree, while you are stopping to decide the affairs of the nation with him—a few minutes taken to slide it under the bark, while you are waiting for a meal at home, will transform a useless shoot into a valuable tree, that shall furnish pleasure and nutriment to generations of men. A few minutes improved now and then, which would be otherwise idled away, will surround your dwelling with a grove which will prove of the greatest utility and delightful embellishment. I know men say they have no time, yet I have always observed that men who make this excuse have plenty of time to lounge at the tavern—plenty of time to run after some mountebank or charletan—plenty of time to litigate with a neighbor. No! man! plant the tree. It will grow while you sleep. Bud it. Graft it. Nurse it, and it shall gladden the sight and please the palate of people yet unborn, and you shall have a memorial of your existence, springing from the sod, when you shall repose beneath it.

Some five or six years ago I found on the place where I reside some scrubs of natural fruit. The tops of my trees, my neighbors said, were too large to graft. But they were grafted with considerable labor. My predecessor might have budded or grafted each with a single germ, and saved me nine-

teen twentieths of the time and expense. Another set of men told me the country was not natural for fruit. I put in the grafts, and for years have had an abundance of delicious fruit for the table or cookery, for myself and my neighbors in summer, fall, and winter, and I find none will eat more greedily than those who have no time to graft their own trees, and who curse the climate as unfit for fruit."

SEEDS OF FRUIT TREES.

In addition to what has already been said under the head of "Propagation by Seeds," a few more observations on this subject are deemed proper in this portion of our work. There are very few seedling fruits out of the great number grown, which are worth the place they occupy, as compared with those which are propagated by budding and grafting; and no man should ever think of relying on these for the supply of fruits for market or for family use. Still every man desires to know how to propagate the different varieties of fruits from the seed, that he may be able to supply himself with stocks if he chooses, on which to graft or bud those he may select for his own culture.

The seeds of apple, pear, and quince, may be treated substantially alike. Those of the first may be taken from the fruit itself, or, if more convenient, washed from the pomace at the cider mill as soon as possible after the juice is extracted." (One objection to this, however, is, that generally there is a mixture of seeds in the pomace of all varieties, slow-growing and free-growing, healthy and unhealthy, dwarfish and scrubby—and one would wish to propagate from the most thrifty and suitable. It would, therefore, be proper to select the kernels from the most healthy, free-growing varieties.) "It is common to obtain seeds from rotten apples. This may be done by mashing them in a plentiful supply of water, and running them through a sieve, by which the pulp will be carried off and the seeds retained. Pomace may be washed by macerating in water, and then running it through a long spout, when the seeds will fall to the bottom and the refuse matter pass off. This is quite easy, when there is a small spring of

water with a fall, or even a pump to be used. Pear seeds are difficult to manage, and should be taken from the fruit as soon after it is well ripened as convenient. The seeds of the poorer sorts, if *free-growers*, such as the common Choke pears, are most plentiful and best.

The seeds of the apple, pear, and quince may be planted as soon as washed out, in good, moist, deep and rich soil, where they will vegetate freely with the ensuing spring. Those of the pear are the most difficult of all; and the young plants are the most tender and precarious. It is of very little use to plant pomace of rotten apples, and none at all to plant rotten pears. Not one in a hundred, if in a thousand, will come. It does not destroy the vitality of the seeds to dry them and keep them over; though we have found them more difficult to vegetate than those planted in time. They are often kept dry for several years, and then sown with success; though a portion of them will always in such cases fail.

Pears and apples are ready for the bud the second year, provided they receive a good growth and are well treated.

Though quinces may be grown from the seed, a better way is to use the cuttings. We have been nearly as successful with them as with those of the currant; and they may be propagated in this way indefinitely.

The kernels of the peach, cherry, and plum, after being taken from the ripe fruit, should be immediately planted in the seed bed, where they will make their appearance in the following spring. It is sometimes recommended to put cherries in sand and keep them until spring before planting out. This is an unsafe mode, from the fact that they are liable to start before planting; and, when this is the case, their removal is their destruction. If the kernels of either of these fruits are allowed to become dry before planting, they will not open again, though exposed to the frost and wet of Winter. There will be exceptions, and only such, to this, among the peach kernels, but none, or next to none, with either of the other named fruits. The vital powers of a peach seed are not destroyed in many years by being dried, and if the kernels are broken, the dried ones may be grown; but without this care, not one in a hundred will germinate.

After standing the first season in the seed beds, all these fruits should be removed to nursery rows, setting them therein about one foot or fifteen inches apart, having taken the precaution to cut off one half of the length of the *tap-root*. The peaches will be ready for the bud the first season, and the others, the second.

Some prefer grafting these fruits, with the exception of the peach, but budding is so much easier, and quite as sure, that it will probably be adhered to instead, both by nurserymen and those who cultivate for themselves; though the former, as a saving of time, will practice all the usual modes of propagation."

THE NURSERY.

NURSERY, in horticulture, is a piece of land selected for raising or propagating plants and trees, with a view to supplying both gardens and plantations.

As we state under distinct heads the mode of cultivation to be adopted in the rearing of plants, and more especially of the apple and peach tree, we shall communicate a few more general hints and directions in regard to establishing and managing a nursery :

I. A nursery ought to be situated contiguously to the dwelling-house, that it may be conveniently inspected in every season ; it should likewise be in the vicinity of a brook or rivulet, in order that there may be a constant supply of water during the hot days of Summer.

II. If intended for timber trees, the nursery should be formed on the ground which is designed for the future plantation, so that a sufficient number may be suffered to stand, when the others have been removed.

III. With respect to fruit trees : 1. The soil ought to be fresh, rather dry than moist, and not richer than that into which they are finally to be transplanted. 2. It should be carefully enclosed, to exclude hares, rabbits, and all other animals that infest young plantations; after which the ground must be diligently cleared from all weeds, and *trenched* or ploughed deep, followed by a subsoil plough to the depth of

at least eighteen inches, in the month of July or August, so that the nursery may be ready for the reception of the young stocks early in October. 3. On the approach of the planting season, the soil must be laid as level as possible, and divided into equal quarters, which ought likewise to be subdivided into beds, wherein may be sown the seeds or kernel of the fruit intended to be reared. Lastly, when a sufficient number of *stocks* is obtained, they must be removed into such soils and exposed to such situations, as the nature of each fruit may require.

ORCHARDS.

ORCHARD, in horticulture, is a tract of land appropriated to the growth of standard fruit trees, with a view to furnish a supply of the most useful kinds of fruit.

Orchards are sometimes confined to the cultivation of apples, peaches, pears, cherries, or other particular fruit, especially if they are situated in the vicinity of railroads, canals, towns, or cities; more frequently, however, they are composed of all the trees before mentioned, with a double proportion of those bearing apples, which, doubtless, are the most plentiful and valuable fruit that may be easily preserved during the whole year. It is also the custom, when standard apple trees are planted from 30 to 33 feet apart, to place *two* dwarf trees at equal distances between them.

The utility of a *general* orchard, both for domestic use and the sale of its production, is evident to the most superficial observer, independently of the beautiful appearance it presents, from an early period in the spring to late in the autumn, . . . we shall, therefore, give some directions from *practical* writers and *actual* experience on the proper management of this most important department of economy.

I.—EXTENT, SITUATION AND SOIL.

The *extent* of an orchard should be in proportion to that of arable land, and the quantity of fruit required either for private use or the supply of the public market; so that the plantation may consist of from half an acre to twenty acres. As, however, there are many friends of horticulture whose possessions confine them to a small compass, and who, nevertheless, wish to practice this useful art on a systematic plan, we have subjoined a cut in which the proper place of each tree is accurately represented, and the most valuable fruit trees are distinctly pointed out.

The *situation* and *aspect* may vary according to circumstances, provided the soil is good. All low, damp exposures, however, ought to be purposely avoided, as no fruit trees will flourish there, nor can their productions be fine or well flavored. A moderately low situation, therefore, is preferable to elevated lands, provided it is *dry*, because it will be sheltered from the effects of tempestuous winds; though a small declivity will be very desirable, especially if its aspect incline towards the east, southeast, or to the south; which situations are always more eligible than a western exposure."

(The above directions respecting the choice of situation for an orchard are inserted here to keep the reader in mind of the necessity of caution in following the directions of European writers on horticulture. Ample reasons will be given in the course of this work for preferring even a northern situation for both apple and peach trees in this country.)

It is a well known fact that in those western parts of the United States, which have a high exposure to the winter's blasts, 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. Some account for this phenomenon as follows: they 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 wont 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. Mr. C. Yancey, of Amherst county, Virginia, who was remarkable for his fine orchards and management of fruits, always preferred the north side of a lofty mountain for his peach orchard.

Another gentleman observed, that during a hard winter he saw a particular tree, in a row of the same kind and growth, preserved through the mere accident of its having been paved with oyster shells.

It is also to be remarked that the southwestern mountains of Piedmont Virginia, which are not very high, are noted for the production of fine fruit.*

The apple, peach, pear, and cherry arrive at the greatest perfection, not only on all the hills, declivities, and valleys adjacent, but from foot to top, on both north and south sides of these mountains. As fine fruit grows on the north sides and top as can be produced in any country. It is also observable that a line, thermal belt, perhaps, it might be called, ranging about midway the south sides of the mountains expand vegetation some eight or ten days earlier than at the lowest or highest parts, being sheltered from the high north and north-west winds of the one and the vernal frosts of the other.

A correspondent, when writing a friend in Albemarle county, in the section above referred to, states that he found all the peaches had been killed by frost in the peach orchards in the valley near the mansion, while they had escaped, and were bearing in great abundance at another part of the estate higher up the side of the neighboring mountain.

With respect to *soil* any common field, or pasture, which produces abundant crops of corn, grass, or culinary vegetables, may be chosen for laying out an orchard. If it be of a rich loamy nature, it will be of great advantage; though any soil of good quality may be prepared for the purpose; but it must be neither too wet or heavy; nor too light or dry; it should be soft, easily worked, and have at least one spade deep of vegetable mould.

Cole, in his American Fruit Book, says, "soils have a powerful effect in the modification of fruit, so much that some are large, fair, and of the greatest excellence on one soil and

* An intelligent Pennsylvanian who had paid great attention to fruit, and who had traveled through many States of the Union, recently stated that he regarded the *Piedmont* region of Virginia as decidedly the best portion of the United States for the production of fine apples.

worthless on another. They also vary the time of ripening, and materially affect the tree in growth, health, size, and longevity. The choice of a proper soil is, doubtless, not sufficiently attended to. Orchardists of judgment and experience agree, that apples growing in a loose soil produce much more rich and generous liquor, than those that grow in a stiff clayey soil; but, if cultivation and *mulching* is properly attended to, provided the soil is well drained, the most satisfactory growth and fruiting may easily be obtained from such '*stiff, clayey soil.*' " The author is of opinion that, if properly managed, it cannot be excelled—it only requires such manures as have a tendency to loosen the soil, and more frequent and better cultivation.

In regard to clayey soils, a writer says: "I have visited many fruit raisers to examine their orchards and the products. The evidence obtained leaves no doubt in my mind, but that a *clayey loam* is the only soil which will admit the highest degree of cultivation for the apple without endangering its keeping qualities."

In the "*Southwest Mountain*" section of Virginia, just referred to, the soil is of a fine Spanish-brown color, approaching to red—when wet, very tenacious—when dry, spongy and puffy; and, when new or fresh, produces the largest and finest crops of corn, oats, tobacco, and wheat, without manure. This is the character of the soil that produced the "*Albemarle Pippin*" and the "*Nelson Pilot apple*," the most valuable of all winter apples.

The rich alluvion deposited by annual floods; the sandy slopes of the low lands, furnishing little else than silica; limestone cliffs, affording along their sides the richest of fruit soils; high clayey ridges, requiring thorough tilth; and broad river bottoms with deep black soil, are all congenial, and well adapted to the general culture of the apple. But all these various soils are disposed to favor the growth of particular varieties, and it should be the business of the horticulturist to classify and point out to the fruit grower and farmer the advantages to be derived from a discriminating selection.

Dr. J. A. Warder, the distinguished horticulturist of the

West, is of opinion that "an elevated situation, with light, porous soil, is the most proper location for an apple orchard, although it is found that fruit trees will thrive in newly cleared land, if set among the stumps; they have been planted on prairie sod, and there are many fine orchards on rocky tracts, where the preparation must be done exclusively with the pick, the spade, and the shovel. It may be the *best economy* for the owner of such land to appropriate it to the orchard, because it is unfitted for tillage crops." *Decidedly best*, for the product of such rough land may be made to vie with and even surpass in value the richest and most highly cultivated acres of the farm.

A gentleman who owns a farm in a rough, mountainous, red-land section of Virginia, has an orchard, which in the aggregate is a large one, planted entirely on such spots—no order or regularity is observed or attempted, but the trees are set in fence corners, abrupt declivities, beside heaps of stone, along lanes and places impracticable for tillage with the plough, where only the pick and mattock can be used to loosen the soil—and these places produce thrifty trees, and fruit of the very best quality—the rich, light, friable soil requiring but little cultivation. These spots, which otherwise would be valueless, are thus made, with little labor and expense, the most productive parts of the farm.

As farther proof of the adaptability of certain soils to large growth and successful apple culture, the author will here describe a large tree, in his own neighborhood, which description he gave the *Southern Planter and Farmer* some months ago:

Probably the largest apple tree in the Southern States is now standing in a dilapidated condition on a farm at present owned by the heirs of the late Professor George Blaetterman, of the University of Virginia, in Albemarle county, three miles south of the southwest mountains. The soil that produced this noble old patriarch is friable and loamy, of dark mulatto color, and a little mixed with small yellow gravel; clay subsoil, and immediately over the only bed or vein of limestone between the ocean and the mountains. This tree is upwards of three feet in diameter three feet above the ground,

and its present height is not less than thirty-five or forty feet. One of its branches has decayed and fallen off. The tree still bears fruit of medium size and indifferent flavor, but makes good cider. It has two or three neighbors standing near at irregular intervals—all are much decayed, and one, fully as large as the one I am describing, has fallen, and its bulky ruins still remain. All these trees are evidently *seedlings*. An old dwelling once stood near them, which was built and occupied by the Sharpe family, who were among the pioneers of this section. The scope of the writer's recollection is some fifty-five years, and these trees were grand old specimens at his earliest recollection. They are probably not less than one hundred years old.

All that has life must perish and decay,
 Mix dust to dust, though long or short the stay.
 Oft has dread lightnings quivered o'er thy head,
 And raging tempest rocked thee in thy bed ;
 And winds less rapid oft have spread around
 And cast thy fruit all pattering to the ground ;
 Where man and beast the benefit received,
 And thou wert of the bending load relieved.

The pomologist may infer that the soil above described is the very best, and most suitable for the growth of the "*prince of all fruits*," the Apple—yet, the farmer and orchardist should bear in mind that any good, strong soil, of whatever color, texture, or consistence, that will grow good corn, wheat, or tobacco, will produce fair crops of fruit; and, with proper care and tillage, abundant returns may be expected.

PREPARATION OF SOIL.

Any good farmer will not be surprised to learn that very thorough cultivation of the land appropriated to orchards, even if the situation is favorable, is not to be dispensed with. As a general rule, it should be deeply and well ploughed, followed by a new-ground coulter or subsoil plough to lift and pulverize the soil. The harrow should then be applied and the soil reduced to a fine tilth.

The mattock may be used on steep or stony ground, where

ploughing is impracticable; "but *trenching* the ground with the spade is a much more efficient mode of preparation than can be effected by the mattock; for, where it is properly performed, the surface soil is thrown to the bottom, and the fat subsoil is brought to the top, from which procedure results not only the thorough culture that is desired, but the mould is placed below, for the deep roots and the new soil, free from the seeds of weeds, is brought within the reach of the sun and frost and atmospheric influences. It is not necessary to describe the process of trenching, nor to enlarge upon its advantages, as they are generally understood. The only difficulty is the cost, which may deter many from the practice of this mode. The expense of trenching an acre of land, clear soil, would be at this time about \$50. The same land may be ploughed nearly as deeply for about \$10; showing a difference of outlay in this important item that would induce most persons to dispense with the spade in the preparation of orchard land.

The land selected for orchards, if not sufficiently rich, should be well manured *before ploughing*; and after setting the trees, a covering of leaves, straw, or any kind of litter, will have a most beneficial effect in relieving the effects of drought, producing an even temperature, a regular and healthy growth, and will promote fair and abundant crops as the trees approach maturity.

We read in the New Testament of an ancient cultivator who had got it into his head that digging and dunging a tree might help it. The faults of ordinary management are the impoverishment of the soil and the withholding of proper manures; such as "*muck*," ditch mud, peat and animal manures, ashes, &c., the first four having been properly acted on by the freezing of a winter. All these together make a compost of the best description for thin soil, intended for setting an orchard, or, to be used to promote the free growth of the trees in the process of cultivation.

Surface draining should not be neglected, and under draining is indispensable in low and very moist situations; for the apple tree is a little "impatient of wet," and does not well

“bear a wet foot.” Most situations, however, in the highlands, that would be preferred for orchards, have natural drainage sufficient for every purpose. Even some of those plants which are considered aquatics, appear to thrive better, when the redundance of wetness is in some measure alleviated by drainage. As a general rule, if the soil be retentive, or wet, it would be best to practice thorough drainage, by a system of under-drains. It is not deemed necessary in this work to describe the process of underdraining, or to expatiate on its merits and advantages, as every farmer knows, or has the means of knowing, whatever is practicable or profitable about it.

Large quantities of barnyard manure are not recommended in setting out young trees, or in orchard culture; although, if *well rotted* and in moderate quantities, its effects on the growth of young trees is very obvious. Ashes, lime, plaster, charcoal, bone dust, muck, and, better than all, sods and soil from fence-sides and corners, road-sides and forest, constitute the proper food for the apple orchard; but lime should not be used among *young* trees, unless in such quantities as farmers usually spread on their cereal crops, and if so used, its application is exceedingly proper, especially on clayey soils.

Downing, in his magnificent and elaborate work on “*The Fruits and Fruit Trees of America*,” says, in regard to preparing the places, “Here is the fatal stumbling-block of all novices and ignorant persons in transplanting. An English gardener when he is about to plant fruit trees, talks about *preparing his borders*; an American says he will *dig his holes*; and we cannot give a more forcible illustration of the ideas of the two persons as to the wants of a fruit tree, or a better notion of the comparative provision made to supply these wants, than by contrasting the two phrases themselves. The one looks upon a tree as a living being, whose life is to be rendered long, vigorous and fruitful by a good supply of food, and a soil mellow and easily penetrated by the smallest fibre; the other considers it very much in the light of a truncheon, or a post, which he thrusts into the smallest possible hole, and supplies with the least portion of manure, trusting to what

he seems to believe the inextinguishable powers of nature, to make roots and branches under any circumstances. It is true that the terms differ somewhat from the nature of the culture and the greater preparation necessary in planting fruit trees in England, but this is not by any means sufficient to justify the different modes of performing the same operation there and here.

“In truth, in this country, where the sun and climate are so favorable, where pruning and training are comparatively so little necessary, the great requisite to success in the ordinary culture of fruit trees is the *proper preparation of the soil before a tree is planted*. Whether a transplanted tree shall struggle several years to recover, or grow moderately after a short time, or at once start into a very luxuriant and vigorous growth, depends entirely upon the amount of care and labor the planter is willing to bestow on the soil for his trees. We have seen several instances where, side by side, one man planted his trees in large spaces of deeply moved and rich soil, and another in small holes in the common mode, which uniformly showed the trees of the first larger after five years, than those of the last, after twelve.”

We have written and quoted enough to satisfy the intelligent planter that the great desideratum in the art of transplanting, is THOROUGH PREPARATION OF THE SOIL; that is the foundation of all after work, and the main source of all subsequent free-growth and thrift in the young plant. The tree thus placed in the most favorable situation, luxuriates in the mellow soil, and grows off at once freely and vigorously spreading its verdant branches, supported by a stem, smooth, elastic, and green as the young hickory.

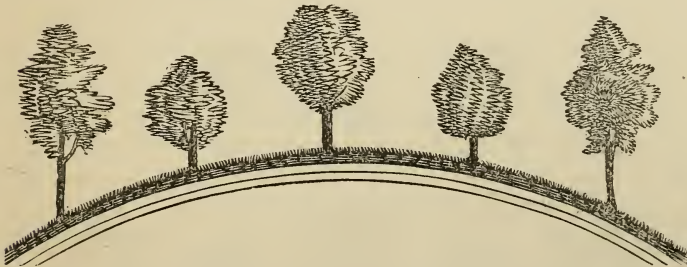
MANURE FOR TREES.

The *bog-mud* from ditches, leaves, trash, soil from fence corners, &c., should be collected and mixed with animal manures to form a compost *the most valuable* for trees of almost every description. The muck, or mud, should be thrown out during the dry weather of summer or fall, and should be

occasionally stirred, and left for the freezing and frost of one winter to mellow it—a little lime, or ashes,* added to the heap contributes greatly to its value; the rubbish lime from old walls and buildings is the best. Well rotted stable manure alone is also very beneficial as a top dressing for trees.

LAYING OFF.

The soil having been thoroughly prepared and sufficiently manured, the next process will be laying off the ground for planting. This affords an opportunity for the exercise of some skill and taste. In arranging the trees, Mr. Bucknall directs them to be planted conformably to the mode represented in the following cut:



One row of the tallest and strongest standards is to be set on three cold sides, parallel to which, must be planted another row of the next *free-growers*, then the trees are to be disposed in a similar manner, according to their strength, gradually declining in size, to the center. Each standard is to be placed 33 feet apart, between which two dwarf-trees should be planted, all of them being so pruned that each row will, in the course of a few years, form an actual hedge of fruit. The intermediate spaces may be filled with any hoed crops, which should be omitted accordingly as the trees advance in growth. Farther, the rows of trees ought to incline to a point of the compass towards the east, because the sun will shine upon them early in the forenoon, and thus dissipate the

* Well rotted chip manure is excellent for fruit trees. It comes under the head of leaves, forest mould, and such like material from vegetable decay. The effect of ashes is immediate and continues for years.

vapors which arise during the vernal nights, and *stint* the fruit in the earlier stages of its growth.

Having given this general outline relative to the planting of orchards, we should consider our work deficient on a subject of such importance, if we neglected the opportunity of communicating a more complete and systematic introduction to this department of horticulture, with which we have been favored by Mr. Christ, an eminent and practical German writer. In order to enhance the value of this work, we have procured the subjoined cut, which represents two rows of a design for an orchard, occupying *two* acres of ground (Rhenish measure) that is, 19 roods in length, according to the horizontal rows, and 17 roods in breadth, conformably to the perpendicular lines.



In an extensive orchard, the proprietor will find it more advantageous to place the fruit trees at a considerable distance, as, by such arrangement, he will be enabled to train a greater variety of useful plants beneath and between those of a larger size. But *in a limited space of ground*, such as that exhibited in the preceding cut, the primary object will be to make the most economical use of the allotted ground and to secure the greatest possible variety of fruit-bearing trees. Next he will endeavor to arrange them so that they may stand in symmetrical order, and exhibit a pleasing sight. For this purpose the arrangement here proposed, in an irregular square, will be found the most convenient and agreeable to the laws of vegetation. Thus, the eye, wherever it turns, not only

perceives a straight line, and uniform grooves, but the plan itself is the most consistent; because each tree is planted, in a certain space, at the greatest possible distance from the other, and thus, in this manner, is less cumbersome to its neighbor, than it would be in a rectangular square. Hence the proper and most profitable disposition will be that of allowing three rods interval between standards, in the horizontal rows from east to west, and two and a half rods in the perpendicular lines from south to north. This space, however, would, after sometime, be too narrow; one tree would impede the growth of another, and by obstructing the air as well as the rays of the sun, prevent the ripening of the fruit; if the trees were indiscriminately in the spots marked on the plan. . . . To obviate such inconvenience, it should be understood to be a fundamental rule, that *each fruit tree must be provided with a neighbor, which is of a different growth.* It will, therefore, be requisite to make such a choice of the various kinds and species of trees, that one of a vigorous growth with a spreading crown, or top, should stand next to another that expands with less luxuriance, and has fewer or lower branches. This arrangement may be more easily accomplished, as every zealous friend of horticulture will naturally wish to possess in his collection, at least one, or a few trees of every valuable kind of fruit. And in order to facilitate such choice, we shall, in the course of this work, furnish ample catalogues from which proper selections may be made.

But, though the soil and space for standards, according to our plan, be rather sparingly allotted, yet there would remain a considerable piece of ground between them unemployed, for some years, while they are young and growing; hence it will be advisable to plant and train between every two standards, in the horizontal rows, a small or dwarf-tree with a limited top or crown (peach trees would answer very well) bearing early and abundant fruit, until the stems have attained so large a size, and such spreading branches, as to overshadow and stifle their useful but diminutive neighbors. Thus the latter must, according to circumstances, yield the room they occupy to the former; and after having amply repaid the

trouble of rearing them and their proportion of the ground rent, they may still, with proper exertion, be transplanted to another situation.

Among all fruit trees, there are none better calculated for intermediate plantation between standards than the *Yellow Mirabelle*, and the *Golden Pippin*. The former is of tolerably quick growth, may be managed and pruned at pleasure, and generally bears fruit in the second year after having been transplanted; its abundant plums are of great value, both for home consumption and for sale, when in a dried state. The Golden Pippin maintains the same rank among apple trees as the Mirabelle among the plum kind; its growth is moderate, the fruit plentiful and delicious, containing a sharp, aromatic juice and a tender pulp.

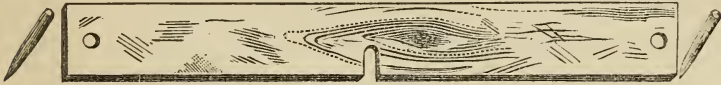
We will now give a few extracts from Coxe, one of the most valuable, practical American works that has been published, but which is now nearly, or quite, out of print, and is rarely to be met with:

"The first thing to be determined upon in the planting of an orchard, is the proper distance of the trees; if a mere fruit plantation be the object, the distance may be small, if the cultivation of grain and grass be in view, (grain and grass should never grow in an orchard,) the space between the trees must be wider; at 30 feet apart, an acre will contain 48 trees; at 35 feet, 35 trees; at 40 feet, 27 trees, and at 50 feet, about 18 trees to the acre. It will probably be found that 40 feet is the most eligible distance for a farm orchard. It will admit sufficient sun and air in our dry, warm climate; and until the trees shall be fully grown, will allow of a profitable application of the ground to the cultivation of grain and grass," (*rather of any kind of hoed crops*). Grain and grass, and especially clover, should never grow among young trees, or even in a grown up orchard. Buckwheat is not so injurious.

Dr. Long, of Illinois, uses a very simple mode of laying off the ground for his orchard trees, by which he secures perfect regularity, without even looking behind him. He uses a very strong line, duly stretched and prepared for the purpose.

(with, we suppose, bits of red flannel sewed on to designate the exact distances of the trees from each other.) With this he marked the spot where to drive his stakes, and then instead of using the *notched board* to determine how to dig the hole and set the tree, he made use of the handle of the spade. By laying it down on the four sides of the stake, he marked out a circle with the stake for the center, which was to be the size of the hole dug. In this way he marked out the exact place where the tree should stand.

THE NOTCHED BOARD.



The notched board for setting trees is prepared as follows:

Take an inch board 8 inches wide, bore a $1\frac{1}{2}$ or 2 inch auger hole exactly in the centre each way, saw out the piece on one side to the hole in the centre of the board, to correspond with the diameter of the hole—then bore an inch hole near each end to pin it to the ground. After the exact place for each tree is designated by a stake, according to Dr. Long's plan, or some other, slip the board on to the stake, *with the stake in the notch*—then drive a pin in the holes in each end and mark off the place to be dug or scraped out—say 4 feet square with the stake in the centre—then lift off the board, pull up the stake, and prepare the place for the tree, which should be from 15 to 18 inches deep, and filled to a sufficient height with rich mellow soil. When ready to plant, replace the board on the end pins, and adjust the tree to the notch, which shows the exact place where the stake stood—see that the tree sits *firmly* on the bottom prepared for it—spread out the roots, having first pared off the wounded ends, and fill in with *fine* rich mould—give the tree a slight churning when the roots are covered, and let the tree sit about as deep as it did in the nursery, which can be known by the color of the bark—during the process tramp in the soil gently with the foot. As a general rule about 3 inches of soil should remain

above the upmost tier of roots. In setting large trees, it is important that the bark of each tree should correspond with the point of the compass to which it stood before removal. We regard the *notched board* as the most correct mode of ascertaining the exact position of the tree.

PREPARING THE HOLES OR PLACES FOR THE TREES.

If the ground has been well loosened with the plough followed by the subsoil plough, or deeply worked with the spade to the depth of 14 or 16 inches, the job of digging the holes will be light. As has already been stated, drainage of some sort is indispensable. In the uplands this expense is unnecessary, as the natural drainage is sufficient. Slaty hill-tops and declivities and gravelly soils are naturally well drained, and most elevated situations are dry enough. Level, clayey soils should be drained, in some way before trees should be planted, as they will not thrive in wet land. When holes are dug with the spade, without drainage, in such soil, you are apt to set your trees in a bed of mortar; then water will stand around them, and will often kill them. Mr. Baldwin's plan is to "plough the ground just to the depth that you wish to set the trees, plough three or four furrows wide and in the direction in which the ground slopes; and then you will have no standing water about your trees. The water does not stagnate but runs off. And then, by this method, I can set five trees while you are setting one with the spade." Dr. Long ridged his wet land and planted upon these ridges, and succeeded well in growing his trees. In regard to deep planting, the Dr. also says, "we must be very careful about digging a deep hole—*deep planting* is very injurious to apple trees for the reason above named, besides you deter many from setting out trees by telling them that they must subsoil, dig great holes, and underdrain."

Mr. Baldwin was of opinion that it was not often necessary to subsoil and underdrain in planting an apple orchard, and would state in reference to the whole subject, that any body who wishes to make trees grow must consult nature. We know where the

soil is wet constantly, trees will not grow. Surface draining, or some other method, must be adopted to drain the land, that the soil may be adapted to the cultivation of fruits. Do this, and your trees will grow. Neglect it and they will not grow. Persons who set out grape vines, for example, in the mud, and expect them to grow and produce fruit, will be disappointed. Better not set them out at all. I repeat, we must, in this matter, consult nature. (We should recollect that the opinions expressed by Dr. Long, and Mr. Baldwin are in reference to tree planting in the deep soil on the prairies.

A correspondent of the *American Agriculturist*, one of the most valuable journals of the kind in the United States, in regard to "*digging holes for trees*," says, "There is a deal of good horticultural sweat wasted in digging holes for trees, when we dig so deep and wide as the fathers in horticulture have taught. There are unfinished portions of creation, of course, where, in planting an apple tree, it may be necessary to remove a load of gravel, and bring a load and a half of soil—growing trees, as it were, in pots. But would it not save transportation to pack up one's baggage and decamp from such places? In a fair soil, if the transplanted tree could but have the earth about it to itself, and not be robbed by some nimble-rooted green-crop, under the guise of "cultivation," or by grass, or foul weeds, of just that ready nutriment which the dismembered tree so sorely needs, 15 or 18 inches is deep enough for the holes. When the tree tops, (I am thinking of apples), are twenty, thirty, forty feet in diameter, even the deepest holes the most enthusiastic cultivator ever perspired in, are insignificant. Manure, too—why put in under the young tree a Golgotha of bones, old boots, stones, tin pots and what not? One shovelful of old barn yard manure will feed a young tree for a year, perhaps more. Can't we save some of this ardor for the time when the tree needs a little pruning, a twig here and there—and, instead of such extreme generosity with the subsoil at the start, show a continuous disposition to let the tree have the surface soil, which it so delights in? Can't we keep up the enthusiasm long enough (having secured thrift, which is half the battle

against insects), to keep vigilant watch for the insidious borer? But that matter of insects must be taken hold of in great earnest. The negligence of cultivators in this respect is costing the nation many millions."*

In digging holes for the trees, the practice of the author is, when the soil is slaty or shallow, to dig them 15 or 20 inches deep, and wide enough for spreading out all the roots in their natural position. Then *subsoil the holes or places*, viz: dig up and pulverize the bottom with a pickaxe or long bladed mattock, to the depth of six or eight inches.† This gives a depth of pulverized earth, when the hole is well filled, of about twenty four or twenty six inches. Where trees are allowed the tap-root, this mode of preparation is far the best; and trees with no tap roots are benefitted by the additional drainage and retention of moisture thus secured. (Something more will be said in regard to *tap roots* in the course of this work.) It does not matter how deep or how wide the holes are dug, the wider and deeper the better, provided they are well filled with good rich soil, mixed with a handfull or two of bone dust or lime—pack a little, and place the soil close around the roots, and fill up to a point that will allow the tree to set, when the work is finished, *no deeper* than it stood in the nursery.

* It is the practice in the West, where the soil is drained and naturally deep and mellow, after the ground has been deeply ploughed and well harrowed, to make the holes or places for setting trees with the plough, by simply marking out the surface at the proper distances, and setting the trees at the intersections. This is done by running in the same furrow several times.

† When the ground is elevated and the bottom of the holes slaty or gravelly, fill in to the depth of 3 or 4 inches with clayey soil from the ditch banks.

PREPARATION OF THE TREES.

As a general thing, trees are placed in the ground precisely as they are sent from the nursery. In removing a tree, no matter how carefully it may be done, a portion of the roots are broken and destroyed, and consequently the balance

that existed in the structure of the tree is deranged. This must be restored by a proper pruning, adapted to the size, form and condition of the tree, as follows :

STANDARD ORCHARD TREES.—These, as sent from the nursery, vary from five to eight feet in height, with naked stems or trunks, and a number of branches at the top forming a head. These branches should be (*somewhat shortened*) cut back to within three or four buds of their base. This lessens the demand upon the roots, and enables the remaining buds to push with vigor. In the case of older trees of extra size, the pruning must be in proportion ; as a general thing, it will be safe to shorten all the previous year's shoots to three or four buds at their base, and where the branches are very numerous, some may be cut out entirely. Although the above "hints on transplanting," are from the pen of an experienced nurseryman, yet, we think, as regards pruning or preparing a tree for transplanting, the writer recommends rather a free use of the knife. Much, however, in our judgment depends on the *condition of the tree*, and the preservation of the roots in taking them up. With the usual fair proportion of roots, as taken from the nursery, and careful setting, such severe pruning as "cutting back to within three or four buds of their base," is rather retarding the growth, and jeopardizing the life of the young tree. The fact must be that the tree needs *some branches* as well as roots, and will lose less, and grow more vigorously, under favorable circumstances, with a moderate proportion of the former. We shall quote other authorities on the subject, as this writer truly says, more fatal errors are committed in *preparing young trees for transplanting* than on any other operation connected with rearing trees.

PYRAMIDAL TREES.—"If of two or three years' growth, with a number of side branches, will require to be pruned with a two-fold object in view, viz: The growth of the tree and the desired form. The branches must be cut in the form of a pyramid by shortening the lower ones, say one half, those above them shorter, and the upper ones around the leading shoot to within two or three buds of their base. The

leader itself must be shortened back one half or more. When trees have been dried or injured much by exposure, the pruning must be closer than if in good order.

DWARF STANDARD TREES AND DWARF BUSHES must be pruned as recommended for standards, aiming at producing a round, well proportioned head, with the main branches regularly distributed, and far enough apart to admit air enough to all parts.

GEARTING TREES INTENDED FOR PYRAMIDS.—Some of these may have a few side branches, the smallest of which should be cut clean away, reserving only the strongest and best placed. In other respects they will be pruned as directed for trees of two years' growth.

Those having no *side branches* should be cut back so far as to insure the production of a tier of branches within six inches or less of the ground. A strong yearling four to six feet, may be cut back about half, and the weaker ones more than that. It is better to cut too low than not low enough, for if the first tier of branches be not low enough, the pyramidal form cannot afterwards be perfected.

PLANTING.—Although very full directions for planting will be given in the course of this work, yet, the views of the excellent author we are quoting on this subject, are so simple and valuable, that, to omit them here would lessen the importance of this part of the work of the orchardist.

“Dig holes in the first place, large enough to admit the roots of the tree to spread out in their natural position. Then having the tree pruned as above directed, let one person hold it in an upright position, and the other shovel in the earth, carefully putting the finest and best from the surface in among the roots, filling every interstice, and bringing every root in contact with the soil. When the earth is nearly filled in, a pail of water may be thrown on to settle and wash in the earth around the roots; then fill in the remainder, and tread gently with the foot. The use of water is seldom necessary, except in dry weather, early in Fall or late in Spring. Guard against planting *too deep*; the trees, after the ground settles, should stand in this respect as they did in the nursery. Trees

on dwarf stocks should stand so that *all the stock* be under the ground, and *no more.*”

In very dry gravelly ground, the holes should be dug twice the usual size and depth, and filled with good loamy soil.

“STAKING.—If trees are tall and much exposed to winds, a stake should be planted *with the tree*, to which it should be tied in such a manner as to avoid chafing. A piece of matting or cloth may be secured *between* the tree and the stake.” (The author is of opinion that some flat rocks around the roots when they are at hand are much better than stakes, as they help to retain the moisture, and the weight keeps the tree in its upright position, without the risk of being chafed, besides securing free motion to the tree—but staking is not needful in ordinary cases, if the trees are well set.

“MULCHING.—When the tree is planted, throw around it as far as the roots extend, and a foot beyond, five or six inches of rough manure or litter. This is highly advantageous everywhere, both in Spring and in Fall planting. It prevents the ground from baking or cracking, and maintains an equal temperature about the roots.” Leaves are the *natural* and best mulching, especially when partly decayed, with a few brush to hold them around the trees; and when the fruit ripens, remove the brush and there is a good protection from bruises and dirt.

“AFTER CULTURE.—(The fruit grower cannot be too often reminded of the advantage of culture.) “The grass should not be allowed to grow around young trees after being planted, as it stunts their growth and utterly ruins them. The ground should be kept clean and loose around them, until at least they are of bearing size.

“*Treatment of trees that have been frozen in the packages, or received during frosty weather*—Place the packages, unopened, in the cellar or some such place, but free from frost, until perfectly thawed, when they can be unpacked, and either planted or placed in a trench, until convenient to plant. Thus treated they will not be injured by freezing. Trees procured in the Fall for Spring planting, should be laid in

trenches in a slanting position to avoid the winds; the situation should also be sheltered, and the soil dry. A mulching on the roots and a few evergreen boughs over the tops, will afford a good protection."

"The above valuable hints on "Transplanting and Preparation of the Trees," are from the *Descriptive Catalogue of Fruits* of Elwanger & Barry, Rochester, N. Y.

DISTANCE BETWEEN TREES IN PLANTATIONS.

According to Downing, "the distance at which trees should be planted in an orchard depends upon the mode in which they are to be treated. When it is desired fully to cover and devote the whole ground to the trees, thirty feet apart is the proper interval; but, where the farmer wishes to keep the land between the trees in grain and grass, fifty feet is not too great a distance in strong soils. Forty feet apart, however, is the usual distance at which the trees are planted in orchards." We object to "*grain and grass*" in orchards, as such cultivation is insufficient. Hoed crops are almost indispensable, and they should not be grown nearer than four feet from the trees, as they deprive the trees of a portion of the moisture and food so much needed for luxuriant and healthy growth, always to be desired in young trees. Nothing should be grown immediately under a tree, and there the cultivation should be with the hoe, and *not too deep*. Experienced cultivators, however, allow that *buckwheat* may be cultivated with advantage in strong soils.

Thirty feet apart, then, is the proper distance in good soils, allowing hoed crops until the trees are getting large, and then give the whole ground to the trees—this will ensure quick growth and early bearing.

In addition to what has already been said on this subject, the views of a few more writers might be useful to the farmer in arranging his orchard.

Under the head of "Laying Off," Mr. Bucknall recommends thirty-three feet apart for large standard trees, with two dwarf trees or bushes between, which may be removed as the large trees require the room they occupy. See also the

views of Mr. Christ, under the same head, who recommends three rods by two and a half, under certain modifications, as the proper distance between the trees.

Coles, in his American Fruit Book, says, "As to the distance between apple trees, much depends on circumstances. A person wanting many kinds on a small space, should set thick and shorten in the limbs as they interfere, and in due time cut away the poorest trees. In general, orchard culture thirty to thirty-three feet is a good distance. Some set forty feet apart, but it allows only about twenty-eight trees to the acre, and will be a long time, if ever, before they cover the land. When set two rods apart, peach, plum, or cherry trees may be set between them; and in most cases these trees will flourish, bear and fail, before the apple trees will need the room. In devoting land wholly to the apple, we would put 100 trees on an acre (almost twenty-one feet apart), and they would bear many years before interfering, and then cut away the poorest trees."

We close this article with a quotation from Coxe, an authority of the highest reputation on the cultivation and management of orchards: "The first thing to be determined upon in the planting of an orchard is, the proper distance of the trees; if a mere fruit plantation be the object, the distance may be small; if the cultivation of grain be in view (we object to that), the space between the trees must be wider; at 30 feet apart an acre will contain 48 trees; at 35 feet, 35 trees; at 40 feet, 27 trees; and at 50 feet, about 18 trees to the acre. It will probably be found that 40 feet is the most eligible distance for a farm orchard. It will admit sufficient sun and air in our dry, warm climate; and, until the trees shall be fully grown, will allow of a profitable application of the ground to the cultivation (of other crops) grain and grass.* *In the arrangement of an orchard, plant each kind in distinct contiguous rows.*"

* In yards and lawns, where grass must be cultivated among the trees, a space some three or four yards in diameter around the trees should be kept clear of grass, and may be dug up, mulched, and manured, thereby accelerating the growth of the trees, improving the quality of the fruit, and protecting from injury the portion that falls to the ground.

TRANSPLANTING.

“Planting, in gardening and agriculture, implies the setting of a plant or tree; which, being moved from its former place, is fixed in a fresh cavity proportioned to its size.”

The whole art of transplanting is a very simple affair, requiring only care and attention, and there is not much difference of opinion among authors and fruit growers on this subject. The ground having been deeply ploughed or dug, and the holes or places prepared as directed in the preceding pages; choose a time in either Fall or Spring, when the ground is not wet or frozen—November and March are, perhaps, the best months for this operation in the South and West; although later in Spring and earlier in Autumn will answer. Sometimes there are spells during the winter months very favorable to planting, and the author has succeeded well in planting trees during mild, dry weather in winter.

In light, puffy, or sandy soil, if such have to be used, Fall planting is considered best, as the soil will become more settled and compact by the time the trees commence growing. On stiff clayey soils, Spring planting will do quite as well, if not better.

The directions contained in the following excellent article, from the pen of John J. Thomas, Esq., on transplanting in Autumn, may be considered fully sufficient, under ordinary circumstances, of tree planting at that season of the year:

“The question is often asked, what is the best time to set out fruit trees? Can we do it while the leaves are yet green, or wait till near winter, after they have fallen? The answer may be, Do it whenever the work can be well done, and while the soil is in proper condition, as to dryness, for working properly. If done early, the leaves must be carefully stripped off, to prevent the rapid evaporation of moisture. We have known trees to have been entirely spoiled in a few hours by wilting, from carelessness in not removing the leaves when taken up. In the Northern States, nurserymen usually commence digging by the first of October. Some trees have entirely ceased growing by this time, including generally, cher-

ries, plums, and standard pears. If the leaves are removed, they may now be taken up and transplanted as well as at any time in Autumn, or the following Spring. Others have not fully completed the ripening of the young wood, which is effected through the assistance of the leaves. The only harm done in taking them up, at this time, is in getting immatured shoots on some parts of the trees, instead of those well-ripened and hardened; and the result will be that some of the tips may be nipped by the frosts of Winter, or they will not start in Spring with so much certainty and vigor. Hardy kinds, such as the apple, will not be much injured in this way; and the peach, although tender, should be shortened back in Spring in any case.

It will be safe, therefore, with few exceptions, to take up trees any time after the 1st of October—care being taken to do the work well, as already indicated.

The soil should be in such condition as to be easily made fine and mellow, so that it may be filled in perfectly among the roots without having interstices. Staking against wind, or effecting the same purpose by a small mound of earth, should not be omitted." (These mounds should be removed in the course of the Summer—their use is very doubtful. The stake is injurious, unless carefully wrapped or padded—a few flat rocks around the stem, where they can be had, is better than either, as they help to retain the moisture, and no winds can displace the tree. If the situation is not exposed to high winds, and the tops are light, no staking is necessary. If the *free motion* of a young tree is prevented by staking, it retards growth and elasticity, and is detrimental to vigor and health.) We never succeeded better than by taking up trees about mid-Autumn, heeling them in by burying the roots and half the stems for wintering, and setting out early in Spring. They, however, do quite as well set out in Autumn, provided they are hardy sorts, and the site is not a windy one. In heeling in for winter, it is absolutely essential to fill all the interstices among the roots very compactly with fine earth. Many trees are needlessly lost by carelessness in this particular. The roots are injured by dryness or mouldiness, and the mice find

easy access among the cavities. To exclude mice effectually, the heeling ground should be clean, and a smooth mound raised on all sides about the trees.

GENERAL DIRECTIONS.—“Dig holes, in the first place, large enough to admit the roots of the tree to spread out in their natural position. Then, having the tree properly pruned, let one person hold it in an upright position and the other shovel in the earth, carefully putting in the finest and best from the surface in among the roots, filling every interstice, and bringing every root in contact with the soil. When the earth is nearly filled, a pail of water may be thrown on to settle and wash in the earth around the roots; then fill in the remainder, and tread gently with the foot. The use of water is seldom necessary, except in dry weather, early in Fall, or late in Spring. Guard against planting *too deep*; the trees, after the ground settles, should stand, in this respect, as they did in the nursery. Trees on dwarf stocks should stand so that *all the stock* be under the ground, and no more. In very dry, gravelly ground, the holes should be dug twice the usual size and depth, and filled with good loamy soil.” (*Ellwanger & Barry.*) We endorse the above, and shall proceed to quote other authors on this subject.

Coxe, in his “View of the Cultivation of Fruit Trees in the United States,” says:

“The proper season for planting will be found to depend on a variety of circumstances. In light soils, the Winter settles the earth around the roots, and best secures them against drought—*it is a time of leisure to the farmer*. In stiff, wet soils, Spring planting is preferred, other things being equal. Have planted at both seasons, and generally found that care and attention ensured corresponding success in the growth of trees. In whatever season an orchard is planted, be careful to extend the roots in every direction; to cut off all wounded parts, and especially not to plant *too deep*; plant with about three inches of earth over the upper tier of roots—which will make it about two inches deeper than it stood in the nursery; after being partially covered, the tree should be well shaken, to admit the finer particles of earth among the fibrous roots;

and let it be well settled by treading the earth around it. The tops of young trees should never be shortened, lest it produce a growth of suckers—the top may be thinned out, if found too heavy. If the trees have been a long time out of the nursery, and the roots have become shriveled at the time of planting, pour a pail of water around each tree.”

There is some discrepancy here between *Coxe* and other authors as regards planting, &c. Although he warns the farmer against “*deep planting*,” yet he plants two inches deeper than the tree originally stood in the nursery, which is at variance with most authors. Next, he says, the trees should be *well shaken* to admit the finer particles of earth around the roots. This shaking or *churning*, as some call it, is objected to by some authors, who maintain that filling in the interstices with fine earth is sufficient, if well done. Then he says, “The tops of young trees should *never* be shortened, lest it produce a growth of suckers.” As to the practice of planting deeper than the tree stood in the nursery, some allowance must be made for the settling of the earth around the tree, so that the depth will remain the same as when the tree grew in the nursery. As to shaking or churning, when the hole is partially filled, if moderately done, should it be of no advantage, it can do no harm. *Downing* says: “Pruning the heads of transplanted trees, at the time of their removal, we think generally an injurious practice.” We are of the same opinion, unless their roots are dried, have been frozen, or improperly managed, when it might be necessary to use the knife freely.

Downing also says that, “More than half the losses in orchard planting in America arises from *deep planting*, and the equally common mode of crowding the earth too tightly about the roots. No tree should be planted deeper than it formerly grew, as its roots are stifled from want of air, or starved by the poverty of the soil at the depth where they are placed.”

Coles, in his “*American Fruit Book*,” says, in regard to setting trees: “The land and holes being prepared as named, and the broken roots cut off, set the tree and place the roots in their natural position, and so that they will not run down-

ward, and separate those that lie together; carefully guard against *setting too deep*, especially on cold, moist land. Let the upper roots lie a few inches below the surface, when the earth is leveled. The roots being adjusted, place fine loam on them, filling up closely under the heel of the tree,* and all around the roots so as to leave no cavity; treading it down gently, that it may come in close contact with the roots. *Do not shake the tree*, as this will displace the small fibres. The hands should be used, not the foot, or a harsh implement, in adjusting the roots and applying the soil."

"When the hole is filled up level, if it be in Spring, make a cavity to catch the rain. If it be in Fall, make a broad mound around the tree eight or ten inches high, to keep the roots warm, throw off the water, and support the tree. Place a few stones close by the tree, bedded firmly in the mound, then lay sods between the tree and the stones, and press them down closely. Thus set, no stakes are necessary, as the trees will stand a hurricane. It takes but a few minutes to make the mound and fasten the tree. In the Spring, remove the mound and make a cavity, as in Spring setting."

The best season for transplanting is from November to March; because the generality of plants, trees, shrubs, &c., during those months are in a dormant state, and receive but little injury from their removal; provided the roots are well preserved, and the weather open. The quality of the soil, as well as the climate, situation and exposure, should, therefore, be relatively consulted. It will also be necessary to *mark the sides of trees or plants on which they are exposed to the sun*, and place them *exactly* in the same direction; for otherwise the circulation of the sap is prevented or retarded, and their growth consequently impeded. Farther, the roots must be properly spread before the plant is settled in the ground, when a portion of fine mould should be strewed over them; and on being sprinkled with water, the whole ought to be closely pressed down to the consistence of unbroken earth. Next, some coarse litter or mulching should be scattered on the spot

* This is facilitated by preparing a small mound in the bottom of the hole of fine loam or earth.

in order to prevent the roots from being injured by the frost; and, if the trees are exposed to winds, it will be advisable to support them with stakes, during the first year at the least; such stakes, however, must be carefully fixed in a *triangular direction*, inclining towards the tree at the top, in an angle of thirty or forty degrees; and at such depth that they may not *interfere with the roots*. It will also be proper to insert a few *battens* between the stakes, and to intertwine them with small birch or other twigs or wrappings that will not damage the bark, while they admit free passage to the rain water; by this simple contrivance, the bark is at the same time effectually secured from the rot.

Having quoted several authors on transplanting who, in the main, agree as to all essential points, we shall close this article with our own views, and those which we have adopted from the most prominent and reliable sources.

The art of successfully removing trees from one location to another is a very simple, and yet a very important job; for no tree improperly set will ever prosper as it should.

Select any good soil, not wet, that would produce a good crop of corn, tobacco, or potatoes, or, if it has been manured, and raised either of these crops the previous year, so much the better. Stake out your land according to directions under that head—twenty-five or thirty feet apart each way will do very well; dig the holes sixteen to eighteen inches deep,* and much larger than the roots extend—from three to six feet in diameter, according to the size of the tree; small, thrifty trees are the best, as they suffer less in removal, are more sure to take root, and will often surpass in growth much larger trees. Throw away the subsoil by scattering it all around with the shovel. If the hole or cavity is too deep for the tree, fill it up with good surface soil, which may be mixed with well pulverized manure—compost in which bog or ditch mud, well decomposed, predominates is best—to which may be added,

* It is best when the holes are of proper depth, and cleaned out, to dig up the bottom with the mattock five or six inches—let the subsoil remain, then fill in with rich soil.

and well mixed, a pint or a quart of bone dust, according to the size of the tree.

Let some one hold the tree upright in its place, spread out the roots carefully in their natural directions, and fill in the soil carefully, working it in well among the roots with your fingers, so that no holes or interstices will be left for the air to affect the roots. Previously to setting the tree a small hillock should be made *in the hole* at or near the centre to fit the sole or heel of the tree, so that it may stand firm and steady. When the roots are covered some two or three inches with soil, take hold of the stem and give a *slight churning*, which helps to settle the fine earth about the small roots; then press gently with the foot; throw in more soil, and repeat the pressing with the foot—observing at the same time that the tree stands erect. When the hole or cavity is quite filled up, the tree should stand about as deep as it stood in the nursery, which may be known by the appearance of the bark at the root. Some orchardists set one or two inches deeper, to allow for settling of the earth. It is also proper to preserve a slight cavity around the tree to catch the rain, if you plant in Spring. If you set in Fall, have it a little sloping around from the stem. If the weather is dry, dash a pail of water around the tree to settle the ground and furnish the moisture, if it is needed.

In regard to staking, a few rocks, flat ones if you can get them, placed around the stem will answer a better purpose than stakes.

If the above directions are followed, there can be no doubt of luxuriant growth and a good start for the young orchard. Do not work deep near the trees—stir often, and keep out the grass, and the growth even of the first year will be considerable.

MARKING FRUIT TREES.

On a leaf of the farm book or journal, let the farmer put down a *map* of his orchard thus, every dot standing for an apple tree :

NORTH.

*	*	*	*	*	*	*	*
Summer—							
Juncating.	do.	Summer Queen.	Summer Queen.	Golden Dixie.	Golden Dixie.	Early Harvest.	Early Harvest.
*	*	*	*	*	*	*	*
Fall—							
Rambo.	Rambo.	Baldwin.	Baldwin.	Pryor's Red.	Pryor's do.	Fall Pip'n.	Fall P'n.
*	*	*	*	*	*	*	*
Winter—							
Wine Sap.	Wine Sap.	Wine Sap.	Wine Sap.	Alb. Pip'n.	Alb. Pip'n.	Alb. Pip'n.	Alb. P'n.
*	*	*	*	*	*	*	*
Winter—							
Northern Spy.	Northern Spy.	Limber-twig.	Limber-twig.	Rawle's Genet.	Rawle's Genet.	Winter Cheese.	Winter Cheese.

The upper part of the map is north. Then, by counting rows, and the number of the trees in the row, the tree represented by each dot can be identified, and the name of the fruit should be under each dot as shown above. There are other modes, but this is the most convenient and simple.

CULTIVATION OF ORCHARDS.

The soil beneath and around fruit-trees, till they arrive at their full size, should by no means be neglected; as the excellence and maturity of the fruits, will in a great measure depend upon its proper culture . . . Hence, no grass or weeds should be suffered to grow under the trees; but the ground ought to be frequently stirred with the spading fork, mattock, or hoe; but not so deep as to interfere with the roots near the stems of young trees. The ground between the rows should be well cultivated with the plough; and root crops may be grown while the trees are young. When the

trees become large and spreading, the whole of the ground should be appropriated to the use of the trees.

The advantage of frequently breaking the crust and stirring the soil, especially under the trees, is of great benefit, as it allows the fertilizing particles of rain, air, dew, snow, &c., more easily to penetrate into the earth, and produce beneficial effects on the roots—such cultivation is likewise one of the most effectual means of preserving them in a sound and healthy state, and is most fatal to depredating insects. If manure is freely given between the trees, the soil will be thus so much improved as to serve for raising the most abundant crops of vegetable roots: particularly, *turnips* and *potatoes*. The former are peculiarly calculated for this purpose; as they do not exhaust the soil in any degree equal to the impoverishing effects of the latter. In fact, in order to secure the very best results, the *grown up orchard* also should be as well manured, and as highly cultivated as a garden, and the soil kept loose and light *all the time*, no other crops being allowed among the trees.

A correspondent some years ago, under the signature T., in the *Albany Cultivator*, gives the following very valuable advice in regard to the culture and management of fruit trees.

“Nothing has operated more to check improvement, than the neglect of young trees after they are once set out. The man who plants fifty peach trees into meadow ground, and loses one half by being smothered with the growth of the grass, and the other half the following Winter, by the gnawings of meadow mice, will not be long in becoming disheartened in fruit culture. He who sets out a hundred apple trees in grass land, or in ground devoted to the cultivation of wheat and oats, where tripple the time necessarily required, elapses before the trees bear, satisfies himself and his neighbors that he who plants young trees only plants for posterity. No conclusion can be more erroneous, no practice more pernicious to horticultural improvement. When the best management is given—and the best is incomparably the cheapest and most economical—young trees, no larger than a carriage whip, may be brought into a good bearing state, in

an incredibly short time. One of the finest, most productive and most profitable peach orchards in the whole State of New York, is only seven years since setting out. No crop is raised among the trees, but the ground is kept clean and mellow by plowing and harrowing. A very celebrated fruit garden and orchard was planted by the proprietor after age had marked his hair with silvery whiteness; he has now for twenty years enjoyed the luxury of plentiful crops from his trees, and is still in the vigor of life. His success was chiefly owing to *good transplanting*—digging the holes six feet in diameter, and filling them with fine rich earth—and to thorough cultivation of the soil for several subsequent years.

There are various degrees of good and bad treatment, which from their common or uncommon occurrence, deserve to be pointed out.

1. The worst of all is to transplant young trees to a meadow, and worst of all a clover meadow. An orchard of several hundred peach trees was noticed last Summer, which had been set out in a clover lot the previous Spring or Autumn, and though the trees appeared to have been of fine growth before transplanting, not one in twenty was alive. If it ever becomes necessary to set out young trees in meadow ground, each row must stand on a ploughed strip of land, at least seven feet wide, kept constantly clean and mellow.

2. Next to meadows, placing young trees among grain crops sown broadcast is the worst. They may in such circumstances, survive removal, but, it is impossible for them to make much growth. Young trees, standing in well hoed potato crops, have been observed to make *at least six times* greater length of growth in one season than trees standing in wheat fields. Corn, though greatly shading young trees by its tall growth, is far better than wheat, oats or barley, in consequence of the hoeing and cultivation which is given.

3. The only crops which should be *tolerated*, are low, hoed crops, as ruta bagas, carrots, field beets, potatoes, &c.

4. But the best mode altogether, is to keep the ground clean and mellow for several feet distant (six to ten) from the young trees.

“While trees are yet young and small, the wide intermediate spaces between the rows may be cultivated with roots, leaving about one-third of the land in unoccupied strips next the trees. But when the trees become large, it is far the best not to attempt the raising of any other than the fruit crop. If the trees are of good varieties, the increase in the amount borne, and in the quality and value, where the whole surface is left perfectly free for annual ploughing and monthly harrowing, will many times overbalance the worth of any other crop, which may be derived from the ground, to say nothing of the inconvenience resulting from treading down this other crop in gathering the fruit. All crops necessarily abstract the nourishment which should go to the tree, and prevent that thorough and constant stirring which should be given to the soil. Young trees, the past season, were found to have made nearly double the growth, where the soil was kept clean and unincumbered, compared with those which stood among well cultivated root crops.”

There are many and various modes employed by unskillful and negligent farmers to injure or destroy their young trees. Some will set them out in the most approved mode recommended by the fathers in horticulture, and, *AFTERCULTURE* is never thought of by them. They neglect to inclose the young orchard with a sufficient fence, and the *milch cows* go there and *prune* them for him. Another will suffer the scions to remain out of the ground, until the sun, wind and frost have shriveled them past redemption, and his buckets of water will avail nothing. Others plant well—put the orchard in grass, a luxuriant crop of hay is grown, a dry season comes on, and the trees are dried up, smothered and lost. In this case, perhaps, the nurseryman is blamed for sending out sickly trees in improper condition. But the two great causes of the unsuccessful setting of young orchards, in the South, are, *PLANTING TOO DEEP* and *THE NEGLECT OF AFTERCULTURE*.

In Thomas' excellent book, “The Fruit Culturist,” we find the following directions for ploughing among fruit trees.

“Arrange the horses, when they work near the line of trees, one before the other, *tandem*; let a boy ride the forward one,

use long traces, and a short whiffle-tree (single-tree) and place the whole in charge of a careful man, who knows that one tree is worth more than fifty hills of corn or potatoes, and no danger may be feared." It is, however, safest to use the mattock or spading-fork just under the trees, whether they be large or small, and whether the trees have been mulched or not. If the mulch is in the way, remove a part of it and replace it when the work is done. If trees are well mulched, say 3 or 4 inches in depth, and as far out as the limbs extend, they require but little work immediately under the tree. It is improper to mulch *too deep*, as the air and warmth may be excluded to the disadvantage of the health and free growth of the trees. In working under the trees, the spading-fork is better than the spade or plough, as there is much less damage done to the roots, when that implement is carefully used.

In the usual way of ploughing orchards, the careless ploughman will have to be strictly watched. He will be very apt to allow the top of his hames to bruise and break these tender spreading branches nearest the ground. If he can get his *single-tree* near enough, he will tear off a portion of the tender bark of the trunk, and, if the wound is large, the tree is fatally injured, and had as well be removed and another put in its place. These injuries are frequently inflicted by ignorant, thoughtless persons, who can form no proper estimate of the damage thus sustained by the tree.

The thrift and free growth of young trees may be greatly accelerated by the use of *diluted* soft soap, home-made is best; rub it on up and down the stem, with a coarse rag or brush, as has already been recommended in this work. The author has practiced this in his own orchard, and *knows* it will act as a charm. It loosens and takes off the moss and any extraneous matter adhering to the stems, including insects, their eggs, larva, cocoons, &c., and the process may be extended to the larger limbs as far as a man can reach. This operation is best performed in the Spring, and once or twice during the Summer and Fall. Grown up trees may be treated in the same way, provided they have been well *scraped*, so as not to injure the smooth bark, with a hoe or some other dull tool,

to remove the rough bark that curls up and is ready to peel off; and which is the hiding place for insects. Besides these advantages, the soapsuds (*which must not be too thick or too strong for very young trees*) is diluted by the rains and gradually washed off, nourishing the roots and leaving the young stems smooth and green. This stimulating process is so highly beneficial to the luxuriant growth of young trees, that the farmer or orchardist should not fail to practice it. The old and the grown up trees of the orchard may receive the same treatment, and with the same satisfactory results; and the size, flavor and quality of the fruit will be greatly improved.

In illustration of our ideas on this subject, we append the following extract from an article on Fruit, by J. S. Skinner, of the "Farmers' Cabinet," written about twenty-three years ago:

"From some facts which I have seen but lately, apparently on good authority, I am inclined to think that, like some animals, fruit trees become hide bound, and that like them, also, a good scrubbing and cleaning, to open the pores and promote free perspiration, would greatly contribute to their health. I have lately met with the following statement, which seems highly worthy of attention. It is known to all who know anything of botany, that the bark of a tree when divided horizontally, presents three parts; *liber*, or inner bark, which lies next to the wood; the cellular tissue, or *parenchyma*, distinguished in the bark of a tree by its fine color, but colorless in the bark of the roots; and lastly, the *epidermis*, or outward bark, which is the universal covering of every part of a tree. Now the experiment to which I refer, to ascertain the effect of removing this rough, hardened *epidermis*, or outside coating, from the trunk and limbs of a very large and aged pear tree, was this: the limbs, or branches of the tree, as is often the case in Europe, were trained espalier fashion, or horizontally along the west wall, the branches extending in the most perfect order on each side of the large trunk. The stem or body of the tree was cleared of the *rough* *epidermis* entirely, and the branches on *one* side also were treated in like manner. The branches which extend on the other

side of the stem, had only every alternate branch stripped of the rough, hardened epidermis. Previously to this, the tree had for many years ceased to bear fruit, except occasionally one or two at the extremity of the upper branches. The first season after the above operation, the foliage assumed a luxuriant and healthy appearance on the decorticated half of the branches, and, in the course of the second year, numerous fruit buds were formed, which in due time produced a fine crop of fruit of excellent quality, while those on the other side, on which the epidermis was suffered to remain, continued barren. The application of *soft soap* (soapsuds, he has it) would have secured a yet higher degree of health and fertility. I have observed in the garden of John Willis, at Oxford, in Maryland—one of the best practical horticulturists I ever knew—that the bodies of his bearing fruit trees were—to use almost the strongest figure I can employ—as smooth, as clean, as polished, and as fresh looking as the arm of a beautiful young bride when just stripped of its glove to receive the wedding ring. The truth is, disguise or shy it as we may, young trees require as much watching and cleaning, washing and nursing, and to undergo as many vermifugent operations as young children do; and those who cannot make up their minds to bestow strict and careful attention on both, had better make up their minds not to get either the one or the other; for in both cases they will deserve the stigma, which should always be affixed to cruel and unnatural parents, who wilfully neglect their young ones.”

The above article called forth at the time the following piquant but complimentary remarks from Mr. Botts, editor of the *Southern Planter* :

“As soon as we came to the women and children mixed up with apple, pear and plum trees, we knew whose signature we should find appended to the communication which we have transcribed from the “*Farmers’ Cabinet*.” Mr. Skinner is one of the most racy, piquant and original writers in this country.”

It is to be hoped the young farmer will not be deterred from his operations in the orchard, or anywise discouraged by

what Mr. Skinner has said concerning the "washing and nursing" of young trees. Nothing valuable is attained without some labor and attention, and the rewards of both are sure—especially as regards fruit culture. It is pleasant and healthful to work among the trees, and it is attended with results satisfactory in ratio with the means expended.

ADDITIONAL REMARKS ON CULTIVATION AND THOROUGH PREPARATION OF THE SOIL.

It may not be improper in this place to reiterate and still further insist on the importance of *thorough preparation* of the soil intended for fruit trees—and, indeed, for nearly all vegetable crops. The labor thus expended in advance, may be somewhat tedious, and, perhaps, expensive, but it is capital well laid out; for the after culture will always be light and easy, when the soil is once well and deeply broken, and the manure well mixed with the soil, if it is needed; thrift, free growth, and early bearing are secured, and the benefit appertaining to all these things, is exactly in proportion to the degree of drainage, pulverization, &c., of the soil thus thoroughly effected.

If we study the nature and character of plants, says a Western writer, we find that they take up food through their roots—chiefly through the ends of their roots, which are called spongioles, from their resemblance to a sponge—which is carried in the sap to the leaves and branches, where it extracts other nourishment from the air. This food can only be taken up in a solution of water, and consequently there must be moisture in the soil if we expect plants to thrive. In order to do this, we must loosen the soil, so that the roots can get down where the moisture is. In a dry time we need not expect tender roots to force their way where it is impossible for a strong man to force a crowbar. We must mellow up the soil. All agree that we can raise crops of every description, if it will only rain when we need it. But we cannot make it rain, and we must find some way to get moisture without it. Can we do this? I think we can, and will attempt to show how. It must be done by deep ploughing, and thorough cul-

tivation. All lands do not require deep ploughing—such as have an open, porous subsoil for five or six feet or more, like the Missouri bottoms, some of the lands in the vicinity of Kansas City, and some other sections of the State. What we say in favor of deep ploughing, we think applicable to our immediate vicinity, where we have a tenacious subsoil within a few inches of the surface. There is always the same amount of water in and about the earth's surface. It is either in the ground or in the atmosphere, in the form of vapor. In the winter, there is more in the ground than in summer, for the reason that the heat of the sun evaporates it, and it exists in the air in vapor. Whenever this vapor comes in contact with substances colder than itself, it gives up its heat and is condensed, again becoming water. We can see it in summer collected upon the outside of a pitcher of water. The pitcher looks as though it was sweating. No one believes that it comes through the pitcher; it must come from the air. If we breathe upon an axe in winter, we see it covered with frost or frozen vapor. The cold comes from the axe, the water from the breath. In summer, every night, when the ground is not too much parched, the cold earth receives moisture from the atmosphere in the form of dew. The same process takes place in the soil.

When we open the soil, and mellow it up deep, so as to allow the air to circulate freely among its particles, and reach the lower and cooler portions, the process of condensation takes place, and moisture is abstracted; but unless we plough deep enough, so that the soil below is cooler than the air, no dew will be deposited. If we take two vessels of pulverized earth, one six, the other eighteen inches deep, and place them in the sun, the one eighteen inches deep will be quite moist at the bottom, while the other will be quite as dry as though baked in an oven. The one six inches deep becomes hot, and all the water is evaporated or boiled out of it, while the other is cool and condenses moisture from the atmosphere. Some will say there is no moisture in the soil, in a dry time, two feet below the surface. That is true, unless the ground is mellow. If it is hard pan, it is impossible for the air to circulate there and

give up its moisture. We would not advise turning the surface soil so very deep all at once, (*unless the land is intended for an orchard*). Six inches would do no harm; but the ground below should be mellowed with a subsoil plough. This is an instrument that runs along in the ground like a mole, in the bottom of a furrow made by the common plough, raising and pulverizing the earth, breaking up the compact, cold and water-proof under-stratum of heavy soil, allowing it to fall back in its former place and leaving the thin layer of vegetable mold on top where nature placed it. A tolerable good substitute for the subsoil plough is a narrow, sharp shovel-plough, with a long shank, that would follow in the bottom of the other furrow without throwing the dirt out. (A new-ground coulter is also a good substitute for the subsoil plough.) The most convenient and expeditious way to subsoil, is to have one team attached to the common plough, and with another to follow immediately behind with the subsoil plough in every furrow; although one team might do the work by changing ploughs every round.

The effects of all ploughing, whether deep or shallow, is to admit air, and consequently moisture, to the soil, and to allow the roots to travel to a greater depth into the loosened particles in search of food. The subsoil often contains matters which are deficient in the surface soil. By deep ploughing these are rendered available, and we admit an increased supply of atmospheric fertilizers.

PRUNING OF FRUIT TREES.

Pruning in gardening and the culture of trees, denotes the lopping off exuberant or diseased branches, with a view to render trees more healthful and fruitful; to make them grow higher, and with greater regularity; to produce larger and better tasted fruit, and to give them a more handsome and regular appearance.

Fruit trees in this country are generally grown as *standards*, especially apple trees. In this way they require less care, are better able to develop their natural forms, attain the most rapid growth, and largest size, and bear the greatest quantity

and best quality of fruit, with less labor than in any other mode. The bright sun of our clime reaching through and pervading all parts of the tree, supersedes the necessity of those nice and minute systems of pruning, so largely illustrated and described by British authors on fruit culture. Such practice is of little or no use here, and our favorable climate gives us all this advantage over their particular and tedious operations in this branch of tree culture, made *necessary* by an uncongenial climate.

With respect to *standards*, Mr. BUCKNALL says, it will "be advisable to shorten their branches only, when they are either too luxuriant, or, by growing irregularly, divert the current of the sap, and consequently weaken the whole. In such case, the more vigorous sprouts ought to be closely cut down, in order to strengthen the other parts; but these amputations should not be performed on stone fruit trees, which are very liable to become affected with the gum, and thus, in a short time, to perish. It will, therefore, be necessary in the latter instance, to pinch the straggling shoots early in the Spring But all decaying, or apparently dead branches, whether belonging to wall or other fruit trees, ought to be pruned close to the stem; because by attracting noxious particles from the air, and admitting too great a degree of moisture into the tree, such useless parts contaminate the *balsamic virtues* of the sap, and thus eventually cause the destruction of the tree, by affording a nest in which insects will deposit their eggs Lastly, all branches that intersect each other and thus occasion a confusion in the crown of the tree, ought likewise to be carefully removed; and as vigorous young shoots often spring from old arms near the trunk, and grow up into the head, they must be annually exterminated; lest they should fill the tree with too much wood.

In regard to the proper period for commencing this operation on fruit trees, especially in orchards, Mr. BUCKNALL is of opinion that pruning should be practiced in the nursery, and regularly continued to "the extremity of old age." Thus it will be advisable to take off only a small quantity of wood at one time; and by employing his "*medication*," (or some

kind of paint or composition), the wounds will heal without causing any more blemishes in the tree than those to which it was subject, at the time when the branch was separated. If such tree, however, be very old and much encumbered with useless wood, it will be proper to cut off all decayed, rotten, or blighted branches, previously to the operation; and to rub them with the preparation above alluded to, with a view to exclude the rain and cold winds . . . Lastly, Mr. B. observes, the rest may be left to the discretion of each person, who will soon see how much is necessary; self-conviction being the best school for improvement."

The following excellent directions respecting pruning trees, have been published before; and though the substance of them are already given in the course of this work, yet the manner in which they are here presented to the reader, will be of advantage, as they cannot be too strongly enforced.

"Any time in the month of March is a proper season to prune your trees: mind nothing about the moon, for she concerns herself little about you or your trees, and the sign is always in the right place when it makes you industrious . . . There is no part of a farm that yields so great profit with so little labor as the well cultivated orchard.

"Young trees require to be pruned every year as well as the old. You should never suffer a sucker to remain near the root, from one year to another, nor by any means upon the body or trunk, which you do not intend shall be permanent.

In pruning old trees, and those which have gotten their growth, observe the following rules:

Cut away no limb near the trunk, nor indeed at any distance from it, which is too large at the place of incision to heal or to close over again; this may be determined by the thriftiness of the tree, as well as by the size. If by neglect you have suffered a limb to stand, till it has attained its growth, it must stand otherwise, by extirpating it, (unless defended by '*Forsyth's composition*'), you 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.

For this reason, no sprout should be suffered to remain in or near the body of the sapling, which is not designed shall stand when it has attained its full growth. The long life of different orchards, soil and situation being equal, will depend more on the above management than on any other circumstance.

“In trimming an orchard, great patience and industry are required, which will be amply rewarded at the harvest. You must not only remove all the dead and dry branches, but extirpate every unnecessary twig and sucker, from each branch, to its very extremity.

“The more of this labor that is performed, if performed with judgment, the more thrifty will the tree become and the fruit will not only be increased in quantity but much improved in quality.

“When the tops of the branches of your apple trees begin to die, (which will be much retarded by the above treatment) they ought to be immediately regenerated, by giving what is called a new top: This is done by cutting off a few feet of their extremities, over the whole tree, except cherries, according to FORSYTH, 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, and with which every farmer ought to be acquainted.”

As a general thing in ordinary practice, a careful pruning to regulate the form and growth of standard trees is about all that is necessary.

Every fruit tree, says DOWNING, should be allowed to take its natural form, the whole efforts of the pruner going no farther than to take out all weak and crowded branches.

The pruning of large limbs should be avoided by taking out the superfluous shoots while they are small and tender. Mr. Coxe, in his useful work on American fruit trees, says, “when orchard trees are much pruned, they are apt to throw out numerous (superfluous) suckers from the boughs in the following Summer; these should be nibbed off when they

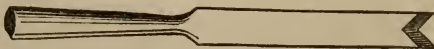
first appear, or they may be easily broken off while young and brittle, cutting is apt to increase their number.

In a healthy, well-shaped tree, pruning is considered "*worse than useless*," except the keeping down of a few *water sprouts* and suckers at the roots. It should be recollected that the free growth of a tree somewhat corresponds with, and is dependent on the action of the leaves and limbs; that if these are properly distributed and in due proportion, perfect health is secured, and the use of the knife is but little required.

The best time for pruning to favor luxuriant growth, according to the theory generally received by orchardists, is in the Fall season, just after the fall of the leaf. Winter is next best, performed in the mildest of the weather, and, in orchard pruning, this is the most convenient season. There are favorable and unfavorable times appertaining to all seasons for pruning fruit trees. One of the best American authors, whose authority is undisputed, remarks, "*that for pruning in the Northern and Middle states, a fortnight before mid-Summer is by far the best season, on the whole, for pruning*". We see no good reason why it should not be in the Southern or Western states. The same author continues: "Wounds made at this season heal over freely and rapidly; it is also the most favorable time to judge of the shape and balance of the head, and to see at a glance which branches require removal; and all the stock of organizable matter in the tree is directed to the branches that remain."

When it is necessary to separate large limbs, the saw should be used; one that is open, with fine teeth, and in good order is best. If the branches are not very large, what is called by carpenters a "*tennon saw*," is much more convenient and less liable to injure the bark.

For small limbs, viz: those from one inch and less in diameter, a *pruning chisel* is used, and is the most convenient implement. It is a socket chisel, blade about eight inches long,



and two inches wide, socket, say five inches long, with basle on one side of about twelve degrees, the edges in the shape of a V. It is used with a long handle and a wooden mallet to drive it.

In removing large limbs, it is important to use some kind of composition to cover the wound, and keep out the water and air, and prevent the wood from cracking until the wound is healed and covered with new bark. The composition is also useful in case of the accidental wounding of a tree, breakage of large limbs from high winds or excessive weight of fruit.

“Shall we grow trees with branches starting from the ground, or, shall we prune; and to what height? These and similar questions, are now often asked. We think it would be superfluous to give any instructions in growing fruit trees to low heads, since for the past sixteen or eighteen years, all our journals both horticultural and agricultural, have vied with each other in descriptions, how best to accomplish, as they supposed, so desirable a result. Indeed, so much has been written on this point, that we have gone from trunks six to eight feet high, down to as many inches. These low headed orchards on coming into bearing, have disappointed, or must soon disappoint their owners. The conditions attending the growing fruits are now so changed from what they were a few years since, that trees with low heads, are, in the main, no longer a success. They increase the labor of cultivation many fold. The low branches cut off the under circulation, inducing disease in the foliage, if not in the fruit. They invite insect enemies, and make it difficult, if not impracticable, to arrest their ravages. In short, low heads are a failure, and the sooner we can induce people to start the heads of their trees at a proper height, the sooner will it be possible to successfully destroy insects, to ward off diseases, to insure color to the fruit, and make it practicable to cultivate near the trees by means of horse power.”

The above paragraph, from the pen of Dr. E. S. Hull of Alton, Illinois, is valuable, and coincides with our own views on the subject. We do not understand, however, what he

means by saying that "the conditions attending the growing fruits, are now so changed from what they were but a few years since that trees with low heads are no longer a success." We know of no change attending the conditions of our fruits.

LOW HEADS RECOMMENDED.

Maj. Brooks, at a discussion on apples at the New York State Fair in 1866, recommends low heads for apple trees.

"Trees have a tendency to produce a surplus of wood; if it all remains the branches are feebly nourished, and some die of starvation, after robbing the others. I think that most trees need to be renewed, like grape-vines, by an annual and moderate removal of small and superfluous branches, *never large ones*. I will add that trees, when young, show an inclination to branch low, which, I think, ought to be respected. Low heads greatly favor picking. Mr. Francis, of York, picked from low trees thirty-two barrels of apples in a day. Low branches mulch the ground partially, and in a degree obviate the necessity of ploughing.

"Another great fault is the omission to *fork over the ground, or plough it light, often succeeded by *deep and reckless ploughing*, to the injury of the roots, and often the destruction of the tree. When the ground is regularly ploughed every year or two, and at a uniform depth, the roots will establish themselves below the ploughing, and if the soil is *deep* they will do very well. But if cultivation is omitted for several years, the roots indulge their *natural habit of running near the surface*, and then deep ploughing destroys many of the tree's best supports. This is especially so on hard pan and cold tenacious sub-soils, which drive the roots to the surface. Roots know better where to go than man can tell them. Nature's method of cultivation is by covering the ground with leaves, at once manuring the soil and mak-

A good strong garden fork is a valuable tool to work the soil beneath all fruit trees, and, when it is well used, there is no need of the plow *immediately under the tree*. Its use is far less liable to injure the roots, and the pulverizing of the ground is equally well or better done than could be accomplished by the plow, or even the mattock.

ing it light and acceptable, as no other process can. Mulching, where leaves and litter can be obtained, is a wonderfully cheap and beneficial expedient, and, in my opinion, may well take the place of ploughing and the attendant cropping, which has doubtless done much to render a majority of our orchards unproductive.”

The reader will pardon us for introducing the above short digression, as the writer's remarks are instructive and spicy.

CAUTIONS IN PRUNING.

In pruning very young trees, side shoots should not be cut off close, but take them off a few inches from the stem. If cut close, it will induce weakness in the stem, the trees will bend over, and no manner of staking can save them. In that case they had better be cut off at the ground, and let them put up anew. Young trees with numerous branches, taper off the stem as they branch off upward, which proves that each branch gives additional strength to the trunk below it; as the stem or trunk enlarges and strengthens, take them off close.

Never allow any person to throw sticks or stones among the branches of any fruit trees, for the purpose of getting down straggling apples, or other fruit, as the bark will be bruised and injured, and it will sometimes cause the decay of the best limbs in the tree.

No person pruning a tree or gathering fruit, should go among the branches with *hard* boots or shoes on, at any season, and more especially when the sap is up and the bark will peel. Unless carefully used, the ladders to gather fruit will bark, bruise and break the limbs, inducing canker and causing rotten limbs.

MEDICATION FOR THE WOUNDS OF FRUIT TREES.

FORSYTH'S COMPOSITION.—Take fresh cow-dung and mix with it human urine and soap-suds; when well mixed, it should be of the consistence of thick paint. It should be laid on the wounded parts with a painter's brush to the thickness of

about one-eighth of an inch, and the edges *finished* off as thin as possible. Next, five parts of dry pulverized wood ashes should be mixed with one part of bone-ashes or dust, and then put into a tin box, the top of which is perforated with holes. The powder must be sprinkled over the surface of the composition, being suffered to remain half an hour for absorbing the moisture, when an additional portion of the powder should be gently applied with the hand, till the whole plaster acquire a smooth surface. As the edges of such excisions grow up, care ought to be taken that no *new* wood may come in contact with the *decayed*; for which purpose it will be advisable to cut out the latter, in proportion as the former advances; a hollow space being left between both, in order that the newly-grown wood may have sufficient room to extend, and fill up the cavity, so that in a manner it forms a new tree. By this process old and decayed trees have, in the second season after its application, produced fruit of the best quality and finest flavor; nay, in the course of three or four years, they yielded such abundant crops, as young healthy trees could not have borne in 15 or 20 years. Previously to the application of the plaster Mr. F. directs all decayed, hollow, loose, rotten, injured, diseased and dead parts to be cut away, till the knife extend to the sound or solid wood, so as to leave the surface perfectly smooth, when the composition prepared in the manner above described should be applied.

PRUNING AND GRAFTING COMPOSITIONS.

GRAFTING COMPOSITION may be used on *all wounded* parts of a tree. It is made of one part beef tallow, two parts beeswax, four parts white resin, melted and well mixed—pour it in a vessel of cold water and work and pull well, as in making shoemaker's wax. This mixture is not liable to become too soft or melt in warm weather, nor too hard for use in cold weather. Be careful to have it of proper temper, so that when applied in cold weather, it will not peel off. It should be pressed closely to the wounded parts, in order that moisture and air may be excluded, whether used in grafting or pruning.

COMPOSITION CLOTH is made by dipping strips of thin cloth into the above composition, and drawing it between two sticks to get off the superfluous matter. They may then be torn into narrower strips to suit the purpose for which they are intended. These bands being weak will yield as the limb expands, so that no injury may be apprehended from their tightness.

CLAY FOR GRAFTING is not so convenient, but it is as good as any other plaster. When nothing is used with it, it is necessary to use bandages of rags, tow or the like, winding it around to support the clay. The best clay composition may be prepared by mixing pure clay with an equal quantity of fine, *fresh* horse manure, with any fine hair worked into it. If the clay is very tenacious, work in a little fine sand to reduce the strength of the clay. The proportions may be varied according to the strength of the clay—some kind of bands must be used to bind it closely to the stock and graft when used in grafting.

PLASTER FOR LARGE WOUNDS.—Take equal parts fresh cow-dung and clay well mixed and tempered with human urine. When there are large hollows, cut out all the rotten and decayed wood and fill the cavity well with the composition—finish the outer edge well and smoothly. It may be applied with a garden or bricklayer's trowel. If in shrinking the surface becomes *cracked*, fill in with more of the composition.

SHELLAC COMPOSITION.—Alcohol and shellac are used by dissolving the shellac until it is of the consistence of thick paint—apply with a painter's brush. This is a very convenient and elegant plaster—it excludes air and water, and is not affected by cold or hot weather. It may be made in the following manner: Take one pint of *strong spirits* and dissolve it in as much shellac as will make a liquid of the consistence of paint. Apply this to the wound with a common painter's brush, always paring the surface of the wound smoothly with the knife. The liquid soon becomes perfectly hard, adheres closely, excludes the air perfectly, and is affected by no changes of weather; while at the same time its thin-

ness offers no resistance to the lip of new wood and bark that gradually closes over the wound. If this composition is kept in a well-corked bottle, sufficiently wide-mouthed to admit the brush, it will always be ready for use and suited to the want of the moment. This is Mr. Downing's receipt.

COMPOSITION OF WHITE LEAD.—The most convenient, simple and cheap, as well as the best composition for pruning, or for spreading over any large wounds, is simply white lead and oil mixed with a little lamp-black to give it a light lead color (if white is objectionable). This will remain longer and has all the good qualities of the "Shellac and Alcohol" Composition. It should be applied with a painter's brush, and, if necessary, a second and even a third coat may be applied to large incisions. The author of this work can recommend this mixture as being the very best for applying to wounds, large or small. It does not answer so well for a grafting composition.

COMPOSITIONS AND WASHES.

When large wounds are to be covered, or the cavities of large limbs to be filled and plastered, the following composition is about the best that can be applied: (the solid wood had better be painted) The plaster is made of equal parts of clay, garden mould, and fresh cow-dung, tempered and made pliable with urine.

The health and vegetation of trees may be greatly promoted by *scraping* them; by cutting away the cankered parts; and by washing their stems *annually*, in the month of February or March, or even later, *with strong soap suds*.

A wash highly recommended for this purpose is made as follows: prepare a mixture of fresh cowdung, urine and soap-suds—the composition to be applied to the stems and branches of fruit or forest trees, in the same manner as the ceilings of rooms are white-washed. It is best to apply it with a large paint brush or coarse rag—for small trees, the rag is best, as it will rub off any extraneous matter adhering to the bark, giving it a smooth surface. (*Diluted soap-suds*

is still better ; but it should not be put on too strong for very young trees.) This operation will not only destroy the eggs of insects, that are hatched during the Spring and Summer, but also prevents the growth of moss ; and if repeated in Autumn, after the fall of the leaves, it will kill the eggs of those numerous insects, which are hatched during that season ; thus greatly contributing to the nourishment and growth of the tree, and preserving its bark in a fine healthy state.

TRAINING.

Training in *gardening*, is the operation or art of forming young trees to a wall or espalier, or of causing them to grow in a shape suitable to that end. According to the British mode training is of but very little use in the United States, and more especially it is a useless job in the Southern and Western states ; as we have a sufficiently dry climate, and hot sun to secure the perfect growth and maturity of the apple, peach and pear, and other valuable fruits, without resorting to this tedious, lengthy and troublesome process to mature fruits. The only objects of training, according to the British acceptation of the term, is to secure a more complete exposure of the leaves and branches to the light and sun, to ripen their fruits in a naturally damp, showery and unfavorable climate. Training in that climate greatly promotes fruitfulness. It retards luxuriance of growth and diminishes the vigor of the trees. Space is a great object in European gardens, and trained trees occupy much less ground than standards, by having a flat surface to correspond with a wall or espalier.

Training, although useless in many respects here, is, nevertheless, very convenient in a small garden. It gives a very beautiful and tasty appearance, and furnishes very superior specimens of fruit. It is practiced to considerable extent in the neighborhood of Boston, and fruit is cultivated in this way, in some situations still farther north. There are various modes ; such as fan training, horizontal training, *geonoville* or conical training, spiral training, pyramidical training, etc. The

advantages of training in a cold or moist climate cannot be appreciated here, and we can raise the best of fruit without any such trouble or expense; allowing our standards to take pretty much their natural shape, thereby securing the full crops resulting from unrestrained growth, and the natural spreading out of the branches freely to the sun and air.

PYRAMIDICAL TRAINING is a very beautiful form suited to apples and pears. It is an easy and simple mode, and has come into general favor with amateurs. The conical form is also much admired. "There can scarcely be a more beautiful display of the art of the horticulturist, than a fine row of trained trees, their branches arranged with the utmost symmetry and regularity, and covered in the fruit season with large and richly colored fruit." The conical training is a very simple and easy mode. It is mostly applied to pears, which, when treated in this way, may be planted eight feet apart, and thus a great variety of sorts may be planted in a small garden.

TREE TRAINING is different from *common tree form*; that being only a modification or limited training. It is intended to produce low and long branches by cutting back the stem, and retarding the growth of the upper limbs, until the lower ones grow large and strong from excess of light and exposure to the sun. It is said "nothing surprises a British gardener more, knowing the cold of our Winter, than the first sight of peaches and other fine fruits arriving at full perfection in the Middle States, with so little care; he sees at once that three-fourths of the great expense of a fruit garden is here rendered needless."

"WHAT ARE DWARF TREES?"

This question is asked and answered by "*Tilton's Journal of Horticulture.*" They are trees grafted on slow growing stock, which would not attain so large a size as the species grafted on it. Dwarf pears are now grafted only upon quinces; but formerly the thorn was used. They are less hardy than upon pear stocks, and require higher cultivation,

and are, therefore, less adapted to orchard than to garden culture. For the latter, they possess many advantages, the greatest of which is, that they come into bearing much sooner than standards. They also admit a greater variety in a small garden, and being within easy reach, can be much better controlled and trained than tall standards. Dwarf apples are grafted upon several species of shrubby apples known as Paradise, or Doucin stocks. They frequently produce fruit when not more than two feet high, and are perfectly hardy.

The cherry is dwarfed by grafting on the *Prunus Mahaleb*, and is more hardy than on the Mazzard stock, which is used for standards.

MULCHING FOR FRUIT TREES.

Mulch is a Hebrew word, to dissolve. In English, "*half rotten straw, leaves, or any coarse half decayed litter.*" The benefits of mulching in Horticulture, as well as in Agriculture, can hardly be over-estimated; especially when practiced in the Southern States. *Leaves* are the natural mulch for shrubs and trees of every description, and makes the best of all *mulching*. They retain sufficient moisture, and at the same time admit the air, that is also necessary for the growth and proper condition of the roots of shrubs, plants and trees. Half rotted straw, old hay, old tan, sea-weed, salt hay, saw-dust, (not pine,) shavings, or any coarse, decaying litter—all these aid in retaining moisture, and as they decompose, make the right kind of manure for trees

In England, *mulching* is much practiced by gardeners, to keep the roots uniformly moist and cool. If an English climate requires such practice, how much more valuable would it prove in the hot exposures of the south. In order to aid in retaining this desirable state of coolness and moisture for fruit trees, Professor Turner's theory, which relates to forming and keeping the head and branches of a tree *low*, so as to shade and shelter the stem and branches, and even the soil in which the roots grow, from violent sunshine, is worthy of extensive treatment in this way; especially in those States south of

North Carolina. When the ground over the roots is exposed to the broad sunshine, then by all means cover the soil—two or three inches is deep enough—and, if you have no leaves or straw, use litter, bark, or any suitable covering that can be obtained.

The "*Rural South Carolinian*" says, in regard to mulching—"If mulching is employed at the time of planting trees, they will never need watering. Uniform temperature and a constant supply of moisture, are the prime elements of success in fruit culture. Mulching enables us to accomplish this. Mulching acts beneficially in other ways. It prevents, in a great degree, the cracking of fruit, and causes those varieties which are spotted and defaced, to become clean and covered with a rich bloom." Mulching young trees obviates the necessity of watering them, but in case of a long, dry spell, after planting, it may become necessary to give them water to save them. One pail of water, with the mulching to retain it and keep the ground from baking, will be of more service than six applied to the naked baked soil, exposed to the hot sun. If the mulching material is light and liable to be blown away from the roots, it is best to throw on a little soil to keep it in place. *Mulching* may sometimes *interfere with cultivation*. In that case it is only necessary to remove a portion of the litter, when the fork or mattock may be applied, and a portion of the mulch *worked into the soil*, which will be all the better for the growth of the young trees and for the thrift, health, and maturity of fruit of the old. The mulching should be immediately replaced.*

Among the improvements and arts of cultivation, all experience proves the great benefits derived from *mulching* the ground around fruit trees, as a means of fertilization and a

* A writer in the *Country Gentleman* says, "The last Spring I set out one hundred apple trees, part of which I mulched with about four inches of coarse hay and straw, and the rest, in pursuance of an article in the *Country Gentleman*, kept nicely hoed. Of the one hundred, all are living except one, but those not mulched have made the best growth, over a foot, notwithstanding the drought."

A near neighbor, who set last year, has lost nearly half of his trees this summer; but then he had the pleasure of harvesting a *poor crop of oats*, sowed close up to the trees. "A word to the wise," etc.

protection from drought and excessive heat, so common in the south and west during the middle or latter part of the Summer season. This mulching, or *shade*, is required for all plants in their infancy, or, when they have suffered violence from removal.

NOTE.—The advantages of *mulching* over *clean culture* is lessened in consequence of the shelter afforded by the former to depredating insects. This shelter, however, may be rendered very uncomfortable by mixing *tobacco stalks* with the mulch, say 15 or 20 lbs. to each tree. Walnut hulls, vines, and leaves will answer the same purpose.

REMEDIES FOR THE REMOVAL OF MOSS.

Moss, in *Horticulture*, is a disease which greatly impedes the free growth of young trees, and effects the thrift and health of those that are grown up, and, at the same time, very materially injures the fruit of orchards.

The remedy usually employed is, to scrape off the moss with a kind of wooden knife, that will not wound the bark or branches; or, to rub them with a strong hair cloth, or coarse woolen, immediately after a heavy rain. But the most effectual method, according to MR. BUCKNALL, consists in washing all the affected branches with soap-suds, and a hard brush, every Spring and Autumn. The action of rubbing, he observes, will so far invigorate the tree as amply to compensate both the labor and expense: the plant will not be injured by this operation, which he directs should be performed in the same manner as a groom curries, or scrubs, the legs of a horse. (Moist weather, or directly after a rain, should be chosen for this business, as the moss may then be easily disengaged.) The most efficacious preventive, however, is to remove the cause, by draining all superfluous moisture from the roots; and, when the trees are first planted, by placing them on the surface of the ground and raising a small mound of good, fresh mould around them, (If this *preventive*, "*placing the trees on the surface*," was practiced in our dry, hot climate, no mulching or watering would save the young scions, but it might answer very well in the cool, moist climate of England,) or in low, very moist lands in this country.

The moss, vegetating on shrubs, &c., is of various kinds, according to the nature and situation of the soil. If the young branches of trees are covered with long and shaggy moss, they will speedily perish; and can only be preserved by cutting them off at the trunk; or, by lopping the head of the shrub or tree if it be found necessary; as it will sprout out again with increased luxuriance. In thick plantations, however, and in cold ground, the trees will always be covered with moss: in such cases they must be thinned, and the land drained or deeply stirred.

When shrubs, fruit trees, &c., are covered with moss, in consequence of the soil being *too dry*, it will be useful to spread large quantities of river or pond-mud about the roots, and to open the ground for the admission of the manure: such expedient will not only cool the land, and greatly suppress the future growth of moss, but at the same time prevent the fruit from falling off too early, . . . a circumstance that frequently happens in orchards in very dry soils. Mr. F., advises moss to be carefully removed in the months of February or March; after which the scraped trees must be washed with a mixture of fresh cow-dung, urine, and soapsuds. If this operation be repeated in Autumn, when the trees are destitute of leaves, it will not only prevent the production of moss, but it will destroy the eggs of numerous insects, that would otherwise be hatched; while it contributes essentially to promote vegetation. But, though moss be in general destructive to the vegetation of shrubs and trees, yet, if growing only on the north side of their trunks, it may be of considerable advantage in cold climates as a shelter to screen them from the severity of the north winds. Or, in very hot climates, if allowed to grow on the south side of trees and shrubs, it would probably be a protection against the fiery rays of the sun.* In the usually fine climate of Virginia, we

*The growth of moss and diseases of the bark, may be caused, or promoted in transplanting, by setting large scions to a different point of the compass from that to which it was grown whilst in the nursery; which practice renders necessary a constitutional change in the texture of the young plant, not only of the bark and wood, but of the *roots*, to accommodate itself to its new position.

have no use for this pestiferous excrescence, and consider it a deadly enemy to the health and free growth of fruit trees. It is only the *old, neglected, or the starved, young orchards* in the South, that are infested with moss, and, the only way for its eradication is to lop, scrape, soap, cultivate, mulch, and manure; and, if judiciously performed and applied, successful renovation will be accomplished. Indeed, if the trunks of old trees are tolerably sound, remunerative crops will certainly be secured, and the trees in a manner be rejuvenated, if treated as above recommended.

Free growing trees are seldom affected with moss, and, prevention is better than remedy. By keeping your trees in a fine, thrifty condition, moss will not accumulate, and many other ills of tree life will be warded off.

VARIOUS MANURES FOR FRUIT TREES.

Almost all kinds of manures are useful for fruit trees. Give the ground under them a heavy dressing of cow-stable or barn-yard manure, muck, or ditch mud, and ashes, which contain much lime, in any convenient proportion. If the land is light or sandy, the muck should largely preponderate. Rich soil, or mould, *opposite in character* to that in which the trees are grown, may be spread and mixed with the soil under them *with great advantage*. Air-slacked lime is excellent for top dressing, so is ashes, both especially so when well rotted litter is added.

APPARENT DECLINE IN THE GROWTH AND PRODUCTIVENESS OF THE APPLE AND OTHER FRUIT TREES.

The declension of fruits is a subject which has elicited some controversy. That varieties of cultivated fruits may, and do decline, is, perhaps, true. But the reason of this deterioration may be accounted for in the altered circumstances under which they are now grown. When the country was new, and the unexhausted, virgin soil teemed with the rich, mellow mould, containing a profuse amount of vegetable food, just suited to

the nature of the trees, our first orchards grew with a thriftiness and vigor that is now unattainable in most parts of the country; unless, where the soil is properly enriched, and the lost ingredients restored in a suitable or scientific manner. The original vegetable mould that has been *worked out*, must be replaced with manures, swamp mud, ashes, lime, mulching, littering with leaves, &c. When this is properly done, and our improved varieties planted, (many of which are superior to the old ones,) we shall have fruit to equal, if not surpass, that of the *olden time*. But this is not all that is required. We must cultivate, and we must fight insect enemies, from which the old orchards were entirely exempt.

If we do these things, we will find that the good days of fruit growing have not departed, and our trees will bend with fair and profuse crops of luscious, excellent fruits. But trees will not take care of themselves; and, the sooner we discover this fact, the better, both for us and them. Every tree exposed to stock,* except hogs and sheep, should be protected in some manner. Do all this, (and it is light work,) and our reward in teeming showers of delicious, mellow fruits will exceed all that we had ever imagined of their value and perfection.

THE BEARING YEAR.

Most authors on apple culture are very brief in their remarks on the subject of the *bearing year*, or alternate year bearers. This is a matter of some consequence to the fruit raiser, who always wishes to have some fruit every year, if possible.

Dr. E. S. Hull, of Alton, Ill., in a lecture on Orchard Fruits, delivered before the Illinois Industrial University, Jan. 19th, 1868, has some sensible remarks bearing on this subject. He says, "It is wholly within our means to prevent

* "The farmer will expend hundreds of dollars in fencing out intruders from his corn and wheat; but he thinks it a hardship to devote half an hour each morning to crush the circulios, or clipping incipient caterpillars' nests from the shoots. The great point is to bring the mind to the adoption of the truth, that vigilance and attention are necessary to secure and preserve fruit as well as other crops"—*Rural Annual*.

over-bearing or barrenness in trees. And he who is ambitious to grow fruit of first quality, or to the most profit, should thoroughly understand the peculiar habits of each variety, and the method by which both barren or alternate year bearers may be made to yield a full *annual* crop of fruit.

To understand this, we must refer to the trees active in growth. Trees which expend all their forces in the production of wood growth, can produce little or no fruit. Indeed, it is not possible for any tree to perfect a fruit germ, and not again in some way disorganize it, unless the wood growth shall cease, in time for the leaves to elaborate food enough to grow both leaf and fruit the following year, or, until a part of the leaves shall attain to nearly or quite their full size. That this is so will be apparent, when we consider that the leaves, which first appear in the Spring, were formed in the buds the previous year, perfect in all their parts, and in the embryo state contained each individual cell found in them when fully grown. But we are asked, if there is no addition to the number of cells, how do the leaves grow? The answer is, that the only difference we can see between an embryo leaf and one full grown, is in the size of the leaf cells. As growth begins in the Spring, these small cells, which we found in the previous year, begin to expand; each individual cell thus enlarges until the whole of the numerous cells of which the leaves are composed are of full size.

To further illustrate this, let us suppose in a brick wall that each brick at the same time were gradually to expand several hundred times its present diameter, and you have just what takes place in the growth of an embryo leaf. Here we find the tree in possession of a full grown leaf. This leaf did not form itself, but was formed by the tree in the preceding year. To produce and sustain this cellular enlargement, there had been stored the previous year a large share of nutriment in the buds and in other parts of the tree. This nutriment, or plant food, must not only be sufficient to feed the embryo leaves, but must also be sufficient to produce the small warty excrescences, the rootlets and spongioles. Those leaves and spongioles first grown were made, with the excep-

tion of moisture, wholly out of the materials that were stored by the tree during the growth of the previous year. When these vegetable stores are in sufficient supply to do this and nourish the fruit germs also, then we shall hear little about imperfect fertilization. On the other hand, had the food been consumed the previous year by ripening an over-crop of fruit, or by making a very succulent growth, then the tree would not store a sufficient amount of plant food to perform its three-fold office in the production of leaves, roots with their spongioles, and fruit. In this condition a part of the leaf, and the larger part, or all of the fruit-buds, yield up their nourishment, which goes to the production of root and leaf growth. The tree, therefore, is barren of fruit for the summer; its whole growth being required to recuperate the growth of the tree. Such trees often bloom freely and cast their bloom. When this occurs, uninformed persons often attribute this to want of fertilization, or suppose that the rains have washed away the pollen, and the like.

Having thus briefly referred to some of the causes of our fruit production and wood growth, we will now return and state how we treat trees bearing *alternate crops*. Alternate bearing trees are such for the reason we have endeavored to explain, viz: *exhaustion*. What we have to do, then, is to economize and equalize the forces of the tree. If it be a Hart or Bigarreau cherry on which we are to operate, our first duty will be an inspection of the buds, that we may know what proportion of them are perfect. But before we proceed, we will have to state that the fruit-buds on most cherries are produced on little spurs, as they are called; these are two, three and four years in forming. Each of these will likely have five, ten or more fruit-buds, and each bud will contain several fruit germs. When all these germs are perfect, we have known as many as sixty fruits produced from a single spur, when not more than a dozen or fifteen could be properly grown.

Understanding, as we now do, the position of the buds on the cherry tree, we next determine their condition by an inspection of them, as detailed in our remarks on buds. Pro-

bably we shall agree, for a tree of which the diameter of the trunk is four inches, one-half bushel of fruit may be reasonably looked for, and for each additional inch in diameter four quarts may be added. Now, let us farther agree on the number of cherries required to fill a half bushel. As our way will double and perhaps triple the size of the leaves, *the fruit will be correspondingly large*. Hence we reduce the usual number, five thousand, to eighteen hundred to fill the measure; next, we estimate our buds, so many to each spur—five will be about right. Now, each of these buds ought to yield three cherries, fifteen to each spur; we shall need, then, only one hundred and twenty spurs, but we will allow a few, and say one hundred and thirty, to provide the required amount. This determined, some time before the buds open in the spring we prune away all the spurs except the requisite number, leaving those that are to remain evenly distributed throughout the tree. In addition to the spurs already formed, there will be a great many of small one-year old spurs developing for fruit for the next and succeeding years. Each year thin these out, always leaving as many again as you ultimately expect to reserve for fruit-bearing, as some of them, under the treatment we have described, are pretty sure to run off into wood growth. Alternate bearing trees managed in this way cannot overbear one year, and hence will not require a *whole year's rest* in which to restore their exhausted energies, as would be the case had the trees received ordinary treatment."

This management of cherries by Dr. Hull may, and doubtless will, succeed admirably, but the process is rather scientific and tedious for most farmers, but may suit amateurs and those who have more leisure. As far as this theory is adapted to apple-culture, there is not so much trouble about it. According to Downing and others, when about half the fruit is thinned out in a young state, say of the size of common grapes, leaving only a moderate crop, the apple, like other fruit trees, will bear *every year*, unless the fruit is destroyed by frost or cold winters. The bearing year of an apple tree, or a whole orchard, may be changed by picking off the fruit

when the trees first show good crops, allowing it to remain only on the alternate seasons which we wish to make the bearing year.

The best and most profitable mode, however, to secure annual crops from trees that are disposed to bear biennially, is to effect this desirable purpose by *proper tillage and by proper manures* combined, thus securing a high state of vigor and productiveness. The manures most likely to supply the trees with proper food and put the soil in high condition, are described in the course of this work—*lime* being a prominent part, if not already in the soil—but caution should be given, as an over-dose would be injurious. It would be best to mix it in the composition heap. (Ashes should also be used.)

There are a few varieties of the apple that will bear annually with ordinary culture and management, and it is of *considerable importance* to know which are these varieties. The author has taken some pains to give a correct list of them, which he will append at the close of this article.

It is desirable to have as many *trees bearing every year* as possible; and, by selecting those which bear annually, this great advantage is secured, even if some of this character do not bear first rate fruit. The *biennial class*, which naturally gives a good crop once in two years, with no cultivation, or with ordinary cultivation, is only of half the value—the qualities of both being equal.

It will doubtless be to the advantage of all apple growers in setting new orchards, or adding to old ones, to have in view the benefit of a proper selection as it regards *annual and biennial* varieties, and those which come into *early bearing*; which, we think, has been overlooked by our most practical horticulturists. We propose appending, according to the best information we can get, and from our own experience, *a list of such varieties*, which will enable those who plant trees to secure advantages in this way.

But to return to the subject of the “bearing year.” The cause generally assigned and believed, in regard to alternate bearing, is, “The exhaustion of most of the organizable matter

laid up to the tree, which requires another season to recover and collect a sufficient supply again to form fruit buds," (which also happens in the case of most nut bearing trees.) This, Mr. COLE says, is not according to analogy, as many other species of trees and shrubs bear abundantly every year. The same author, on page 87, *American Fruit Book*, says, "we first offered to the public the important fact that most of our varieties of apples in New England, natural and grafted, produce *large crops in even years*; 1846, 1848 and 1850, if the season be favorable, and *light crops in odd years*, 1845, 1847 and 1849. Like all new things this view has been opposed and ridiculed, but never met fairly with facts. We observed it for 30 years, and the same orchards in our boyhood, still continue the same. These important facts cannot be laughed down, nor upset by false reasoning. On the contrary, correct observers are confirming what we have said." Mr. Cole does not give his opinion as to the cause of this freak in nature, but is satisfied in believing it is as he has stated. In justice to him, however, he also says: "Yet some trees and some orchards, and in some neighborhoods, most of trees bear in odd years." This he seems to consider only as exceptions to the general rule. According to our experience we know of no such habit attending our orchards, and do not think they stop to play the game of odd and even, but bear their crops according to seasons and circumstances. A late vernal frost sometimes has something to do with the bearing year; and full orchards are occasionally bereft of their fruit buds by a severe Winter in the bearing year, and forced to rest and renovate their fruiting powers until the next season, which in that case will be the bearing year, whether it be odd or even. Other reasons might be assigned for the alternation of the bearing year. We like trees that will bear every year, and if we can control them by aid and art, or in any way induce them to do so, so much the better. But at the same time we should esteem and cherish so much the more highly those few varieties that do so without *coaxing*.

As to the "*even year*" for bearing, our Southern and Western latitudes do not favor any partiality for odd or even

numbers, but leave all such capricious pranks to the soil of New England.

It is not desirable that young trees should bear large crops, and to prevent it, if the time can be spared, a portion of the young fruit had better be thinned out, in order to insure thrifty and vigorous growth, and smaller crops of fine fruit, which is of more importance, when trees commence bearing, than large crops. Trees that are grown up, and those which have attained their full size and maturity, are in a condition by nature to bear full crops, and as a general thing they will do so, some annually and others biennially; but, of course, like animals, they must be well fed and attended to; otherwise we shall, as a general thing, have to be contented with biennial crops.

Mr. A. G. COMINGS, of Mason county, New Hampshire, says of the Baldwin apple, which is usually an alternate bearer: "I have found by experiment that with proper culture it will bear more frequently. I have a tree in a rich loam and under high culture, which was *well supplied* with fruit for five years *in succession*. The apples grew extremely large and were of very fine flavor.

One of Mr. A. J. Downing's correspondents says, in a note: "For several years past I have been experimenting on the apple, having an orchard of two thousand Newtown Pippin trees. I found it very unprofitable to wait for what is called the 'bearing year.' I have noticed from the excessive productiveness of this tree, it requires the intermediate year to recover itself; to extract from the earth and atmosphere the materials to enable it to produce again. This it is not able to do unassisted by art, while it is loaded with fruit, and the intervening year is lost; if, however, the tree is supplied with proper food, it will bear every year; at least, such has been the result of my experiments."

LIST OF ANNUAL BEARING TREES.

The following varieties of apple trees in a soil kept in good condition will bear *every year*, viz:

White Spanish Reinett (Mississippi), highly recommended.

Rawle's Genet, or as some call it Geneting (Winter.)

Higby Sweet (Ohio apple), new.

Wine Sap—nearly every year (finest of market apples).

Limbirtwig (in some situations).

Grimes' Golden—resembles the Newark Pippin—a new variety originated in Brook county, West Virginia—quality, best.

Sops of Wine.

Benoni.

Holland Pippin.

Hubardston's Nonesuch.

Domine.

Stanard.

Minker.

Monte Bello (New), Ch. Downing—an Illinois apple of great promise.

Ramsdell's Sweeting (enormous bearer), October to February.

Milam—Winter variety, much admired in the Piedmont district.

Vandevere—Large, roundish, yellow-ground, marbled with red; flesh yellow, crisp, tender; suited to rich sandy soils.

LIST OF LATE BLOOMING VARIETIES.

In frosty situations the following varieties, in consequence of their habit of late blooming, preserve their blossoms from the vernal frosts during late Spring. The importance of such a selection *is not appreciated as it should be*, and we wish to call the attention of those who are compelled to plant in such situations to the advantage of raising as many late blooming trees as possible.

Rawle's Genet—(from our own observation).

Sweet Genet—a seedling of Rawle's Genet—originated with Mr. Reuben Ragan, of Putnam county, Indiana—fruit large, handsome, fair, expands its blossoms at *least a week* later than its parent, and always escapes Spring frosts.

Ingram's Seedling (new).

Lawver Apple, (new.)

Borsdorff (German apple).
Northern Spy, and
All Russet apples.

REMEDIES FOR UNFRUITFULNESS.

Trees, like animals, are sometimes subject to barrenness. There is no subject within the wide realm of horticulture more difficult to understand or explain satisfactorily than the true cause of vigorous trees failing to bear fruit, especially when they have been well tilled, manured, and pruned. The cause generally assigned is an over-vigorous constitution, causing over-luxuriant growth of shoots and leaves, and excessive wood growth. Other causes have been assigned; as the influence of certain soils—the lack of certain constituent elements in the soil, which are necessary to fruitfulness: such as *potash, soda, &c.*, in limestone soils, and the want of *lime, iron, clay or muck composts* in free stone, sandy, or slaty soils. Over-luxuriance of growth, however, is considered by the best authorities as the most usual cause of unfruitfulness in fruit trees. Fortunately for the orchardist, such condition of his trees very seldom occur, and the remedies in such cases, as generally prescribed, are as follows:

“To induce fruitfulness, when a young tree is too luxuriant, employing all its energies in making vigorous shoots, but forming few or no blossoms and producing no fruit, we have it in our power, by different modes of pruning, to lessen this over-luxuriance, and force it to expend its energies in fruit bearing. The most direct and successful mode of doing this is by *pruning the roots*, a proceeding brought into practice by English gardeners.”

Root Pruning is effected by cutting off a portion of the nourishment supplied by the roots of a tree. The leaves, losing part of their usual nourishment, have not the ability to continue their rapid growth, or maintain the excessive vigor of the balance of the tree, causing the branches to assume slow growth and the organizable matter accumulates, causing fruit buds to be formed. The inclination to luxuriant wood and leaf growth being cut off, the remaining sap and food are

employed in producing and maturing fruit buds for the next year.

The proper time for root pruning is in the Fall or Winter. It is effected by removing the soil from the roots and cutting them off a few feet from the tree; the distance must be regulated according to the size of the tree—the larger roots are cut off, and the ends should be smoothly paired or cut. English nurserymen practice root pruning in this way: They dig a trench or ditch during the Fall, November is preferred, about eighteen inches deep around their trees with a *sharp* spade, cutting off all the roots as smoothly as possible. The distance from the tree varies according to the size and luxuriance of its growth. By adopting this practice, they cause their trees to bear early and full crops, and force apples and pears and other fruits grafted on their own roots to bear abundantly as dwarfs; and, treated in this way, they can be grown from six to eight feet apart and thinned in a conical form.

The ends of the roots cut off in trenching round the tree are abundantly supplied with suitable manure, mixed with soil in the ditch to keep up their health and a proper degree of vigor. Trees dwarfed in this way, by annual root pruning, become very prolific. The plan is well suited to growing trees on a small surface, and to the gardens of amateurs.

An excellent English author in writing on this subject mentions the following advantages to be derived from systematic root pruning.

“1. The facility of thinning (owing to the small size of the trees) and, in some varieties, of setting the blossoms of shy-bearing sorts, and of thinning and gathering the fruit.

“2. It will make the gardener independent of the natural soil of his garden, as a few barrowsfull of rich mould will support a tree for a lengthened period; thus placing bad soils nearly on a level with those the most favorable.

“3. The capability of removing trees of fifteen or twenty years' growth, with as much facility as furniture. To tenants this will indeed be a boon, for perhaps one of the greatest annoyances a tenant is subjected to, is that of being obliged to

leave behind him trees that he has nurtured with the utmost care."

In conclusion, this author recommends *caution*; "enough of vigor must be left in the tree to support its crop of fruit, and one, two, or three seasons' cessation from root pruning will often be found necessary."

Root pruning is only valuable, according to our judgment, when applied to such standard trees as at the usual size and age fail to blossom or bear fruit, or do so in a manner so light and unprofitable that some course is necessary to induce fair crops and full bearing. Such trees will generally require but a single pruning to bring them all right and cause them to assume a permanent fruitful condition. Pears and plums that are shy bearers when grown up, say from twelve to fourteen years old, may be forced in this way to bear when of proper size. An esteemed author observes, "Several nearly full grown peach, pear, and plum trees, on a very rich soil on the Hudson, which were over luxuriant but bore no fruit, were root pruned by our advice two years ago, and yielded most excellent and abundant crops last season." The same author says: "In case of apple orchards, where the permanent value depends on the size, *longevity*, and continued productiveness of the trees, it is better to wait patiently, and not to resort to pruning to bring them into bearing; as it cannot be denied that all *excessive pruning* shortens somewhat the life of the tree." Mr. Coxe, indeed, recommended that the first fruit should *never* be allowed to ripen on a young apple orchard, as it lessens very materially the vigor of the trees.

Pruning the Tops or Shortening-in the extremities of the branches of peach, nectarines and apricots, has a strong tendency to increase the fruitfulness of those trees. By reducing the new wood, the sap is more abundantly distributed in the balance of the branches, causing many bearing shoots to be produced on each branch instead of one.

Spurring-in, which is the annual shortening of the lateral shoots of trained fruit trees, as practiced in England, is performed in order to make them grow short fruit branches or spurs, and is a part of the same theory, and is well adapted to pears, apples, peaches, and other fruits.

Bending Down the Limbs is a mode easily practiced to produce fruitfulness. By doing this, the circulation of the sap is delayed or retarded—the growth becomes less vigorous—the organizable juices and matter increase, and fruit buds are directly formed. The proper time for bending the limbs is the early part of the summer—say during the month of June, when the sap is up and the limbs have become pliant. They are tied or fastened down, below a horizontal line, and forced to remain in this position until the growth of the wood stiffens and causes them to retain permanently the position required for this purpose. It is usual to pin them to the earth by means of forked stakes, the forks inverted and driven in the ground, and when there is danger of chafing or rubbing, the limbs should be protected by soft rags or other wrapping at the places pinned down. Other modes to fasten them to the ground might be adopted, but this is the most simple, and probably the best. When a tree is trained to this position, which is very simple and easily done, it is certain to cause *fruitful branches* and fine fruit on the limbs so treated.

Disbarking and Ringing are modes practiced by some gardeners, and recommended by some writers to induce fruitfulness; but most authors in this country who have written on this subject disapprove of both, and in place of this process keep the bark in a fine green and healthy state, by applications of soft soap or strong soap suds, &c., as a wash; or, by rubbing hard soap on the stems of the trees and on the lower parts of the large limbs.

Bandages or Ligatures very tightly wrapped around the limbs will have the same effect, *temporarily*, as disbarking and ringing with less injury to the tree and branches.

OTHER MODES OF INDUCING FRUITFULNESS.

The productiveness of fruit trees of every description depends very much on the soils in which they are grown. Poor soils stave the trees and reduce the crops, as is well known. Lime stone soils seldom if ever fail to produce fine fruit, and large growth of trees. The largest apple tree perhaps

in Virginia was grown in limestone soil, with rich loamy sub-soil mixed with small gravel. Other strong loamy soils are also well adapted to the fruitfulness as well as vigorous growth of orchard trees. The particular ingredients of soil favorable to full bearing are always present in soils such as these. Soils also have a powerful influence in the growth and modification of fruits. Their size, texture, excellence, and fine keeping qualities are produced and established by the soils in which they are grown. Perhaps, as to flavor, the dark red or chocolate colored soils of the Piedmont region of Virginia, extending into North Carolina, are the very best for the extreme lusciousness and high aromatic flavor, always present in the well cultivated fruits of this region. It is believed that the fruits of this section are also less affected by insect enemies and by vernal frosts.

In regard to the *keeping qualities* of the apple, there can be no doubt but that gray, clayey soils, are decidedly the best, inducing plumpness and firmness in the fruit, and a disposition to hang well and long on the trees.

The Tide-water sections of Maryland, Virginia and North Carolina, where the soil is loamy and not too much sand, or too wet, are well adapted to both the apple and the peach, and the fine qualities of both are secured in an eminent degree, by good cultivation and *by careful selection of varieties to suit this lower section of the country.* (A list of such varieties will be appended in this work.) There are many very fine varieties of apples that will not flourish here that are quite at home in the high, gray, and slaty lands, and mountainous sections where the red soil predominates. (Lists suitable for all these locations will appear in their place in this work.) "Locations bordering on salt water are warmer in Winter and cooler in Summer, as the atmosphere is modified by the more equable temperature of the water," which seldom freezes to any extent. This favorable condition to fruit culture, of the maritime sections of the States above named, may be attributable to the warmth that pervades the surface of the gulf stream. The injury to fruit buds and blossoms by extreme cold and frost is here almost entirely obviated. These

advantages to the fruit grower are already appreciated here, and should be improved to their utmost extent; as the fruits of this section can be put in market *several weeks* in advance of the fruits of the middle and mountainous sections.

The vicinity of large fresh water lakes is also favorable to fruit trees and fruitfulness. The spray that rises from large bodies of water, extracts and expels the frost before the sun rises, and prevents injury to the buds or expanded bloom. This good effect is sometimes lost on the border of lakes in consequence of their being sheeted over with ice.

Sheltered locations, such as narrow, deep valleys, are unfavorable to fruitfulness. They are liable to extremes of temperature, thawing and freezing alternately by day and by night, which changes destroy the tender trees, buds, and blossoms. There is said to be a difference of five or six degrees between such low bottoms and valleys, during the Spring, and the tops or sides of adjacent ridges, where the elevation is not more than 80 or 100 feet.

A German writer, SCHULTZ, in his work entitled "Rejuvenescence of Plants," etc., says, that common salt and chloride of lime contribute greatly to the flowering of plants, to which, however, they can only be applied with safety in small quantities. "Salts of lime," he observes, "appear to produce so nearly the same effect as that of potash and soda, that it is only necessary to place lime within their reach, if there is no deficiency of manure in the shape of general food. *Lime will in the main promote, in an astonishing degree, the fruiting and flowering of most plants, because calcareous salts promote evaporation and the concentration of the sap.*"

These views of Dr. Schultz, are, in the author's opinion, of great value. Coarse salt at the rate of one and a half or two bushels to the acre, as a top dressing on most soils, promote fruitfulness to an eminent degree—and, at the same time, aid in destroying worms and other insects injurious to fruit and fruit trees. Lime has a most powerful effect on the fruiting of the apple and pear. Some years ago, we made an experiment with lime, which being carried a little too far, proved fatal to a pear tree. In removing the lime and rubbish

from the ceiling of an old house, about one bushel, with other litter, was directed to be placed around a pear tree of small size, but of considerable age, which had never blossomed or borne fruit, and had been entirely neglected for many years. This was done early in the Winter. The spot on which it stood was a poor, dry, gray, slaty soil, and was cultivated the following Spring. This tree, at the proper time, bloomed profusely, and a great quantity of fruit set and matured; the quality being first rate. The next or second Spring, the tree failed to bloom, and gradually withered and died, and in the Fall afforded *a small lot of fire wood*, showing doubtless, the effects of an over dose of lime, and forced over-bearing.

These facts, connected with lime and salt, are very well worth the careful attention of the orchardist, and extended experiments on their action and efficiency in promoting fruitfulness in fruit trees should be a subject of scientific research.

Fruitfulness in cold clayey soil may be promoted and the latter made equal to the best, for the apple and peach, and for most other fruits. Where there is but little vegetable mould, decayed litter is mixed with the soil, and a moderate quantity of lime spread broadcast about the roots; the quantity should vary according to circumstances, but, as a general rule, about as much as is deemed sufficient to be spread on corn or wheat fallowed crops, to be applied during the Fall or early Winter, would be about right.

It should be well mixed with the litter and soil. This kind of soil, in addition to the lime and decayed litter, may be rendered still better adapted to the growth and fruitfulness of trees, if the farmer should have the time to give the soil a dressing of river or any other sand, most convenient for that purpose..

The like good effect is secured by mixing with *sandy soil*, clay from ditches—even though it should not be rich in vegetable matter—and then apply mulching of any description to keep the soil cool and moist.

Some English authors recommend the following treatment for trees unfruitful from luxuriance of growth :

When trees are so luxuriant, as not to bear those prolific

spurs from which the fruit proceeds the too abundant flow of their juices, must be checked by the following method: The tops of most of the shoots are to be pruned off in August, the bark perpendicularly slitted in different places, and the trunk cut about one-third through with a saw, but so as not to injure the heart. For the first year, or two, after this experiment, the tree will not bear more fruit than usual, but, afterwards, its production will be adequate to every expectation.

From this operation, (especially in the lower Tide-water district) a still farther benefit may be derived. When there is a superabundance of moisture, the trees are liable to be covered with moss, which affords shelter for caterpillars and other insects; but this process in a great measure cures it, especially if the moss is carefully scrubbed off, or rubbed with a coarse, wet cloth, or nibbed when the trees are wet after a rain.

The pruning of the tops diverts the channel of circulation, and accelerates the growth of the fruit-bearing shoots; while the cutting of the trunk, across, moderates the rise of nourishment, or sap. Thus the sawed part will overgrow in so complete a manner, that it cannot be discerned except from the freshness of its bark. This expedient we have tried on a Juneating tree, some twenty or twenty-five years old, well grown and vigorous, which never bore more than a dozen or two of apples in any year. It grows in a somewhat slaty soil, and has been tolerably well attended to the most of the time. The operations were performed in 1867, and in 1869, no results. We shall expect an increase of fruit this season, 1870.*

The following remarks on "*Root Pruning to induce Fruitfulness,*" we copy from that excellent work, "*The Rural Annual and Horticultural Directory:*" Although a similar mode has just been described, yet this is so simple and so easily performed, we deem it best for ordinary practice.

"When a tree has reached a fruit-bearing size, and shows no symptoms of a fruit bearing disposition, but instead, throws out vigorous branches, root pruning is a very efficacious

*As expected, this tree bore a fair crop of excellent fruit this season.

mode of checking growth. In highly cultivated gardens, where trees are planted, and the roots have access to the rich soil, an immense crop of branches will be produced, and but little, if any, fruit. Root pruning will check such growths most effectually and render the trees fruitful. The operation is performed by digging out a circular trench at a distance of three to six feet from the stem, according to the size of the tree, and cutting all the roots that are encountered or can be reached. The soil is again thrown back, and the process is completed. If done in August, (perhaps the latter part of July would suit the latitude of Virginia and North Carolina best) the supply of sap will immediately be lessened, the wood-maturing principle accelerated, and fruit buds formed. The operation has been performed in Spring with but little benefit. but if done in the Fall, cannot fail in producing the desired results.

Although much more might be said, and many good authors quoted, yet we deem this subject sufficiently elucidated for all practical purposes, and shall proceed to the treatment of over-bearing trees, and a few remarks on "Tap Roots."

TAP ROOTS.

L. S. B., Chicago, Ill., in a recent number of the *Gardeners' Monthly*, remarking on roots, says: "I was interested in what you say about tap roots. You seem to place little value on them. I have been led to believe them very essential, and always give my gardener, as my advice, to save the *tap roots*, when we are transplanting anything upon our lawn. Was your remark intended to have the weight it seems to bear, or a slip of the pen? I have read so often of the great value of tap roots that I want to be sure I understand you. It would seem as if nature would hardly make them, if they were of no use."

(No one disputes this last point—"nature makes everything for some use." Beards are of some use; perhaps to exercise our industry to keep them shaven away. As to tap roots, our correspondent understood us correctly to say that they are not of the slightest service towards the nutrition of the

tree. The shortening of a tap root is of no more injury to a tree than is the shortening of the finger-nails to a man. This matter was settled by Sanebier and others over a hundred years ago. Their experiments we have repeated, and no intelligent man teaches any other doctrine.)—*Gardeners' Monthly*. (We are surprised to learn that any one ever supposed the tap root to be a feeder. Such parties must be very “dull of comprehension.”)—*Editors Southern Farmer*.

Notwithstanding what has just been said by the authorities above quoted, there may be some reason to suspect a use for *perpendicular* or tap roots—if, for no other purpose, to steady the tree and to enable it, in conjunction with the horizontal roots, to sustain itself in hurricanes and high winds. The *Gardeners' Monthly* forgets that many of the esculent roots of his garden have nothing but tap roots with a few straggling spongicles. Tap roots must be of use in their case, and the nutriment they receive is almost entirely through the tap roots. But if the tap roots do not travel abroad in search of food as do other roots, yet they may secure and elaborate substances contained in the subsoil, which is not the office of the horizontal roots to supply, and which they cannot reach, such as clay, iron, &c., so very necessary for the health and vigor of many varieties of our fruit trees.

One reason that nurserymen and others do not save the tap root, is because they cannot well do so in removing the young tree. Unless pains is taken, it is always chopped or torn off; and if it remains to the tree, it is much more difficult to set it steadily and firmly in its new position, and to place the soil closely about this and the crown and horizontal roots above. There is but little doubt that a tree, well planted, with a tap root entire, will stand a better chance to live and thrive and grow off freely than one without it—the deprivation of this root may even effect the longevity of the tree. The only question is, will it pay for the extra labor and care required to preserve it.

OVER-BEARING.

The only practical and safe way to correct over-bearing, in both the apple and pear, is by *thinning the fruit*; not the

leaves and branches. When we attempt to correct this disposition by thinning out the branches, we are liable to injure the tree and fill the head with water-sprouts. We must bring into actual use this much praised but seldom practiced expedient—"thinning-out." It is applicable to the pear and peach also—and, the idea is not so much to lessen the leverage and weight as to prevent excessive production—for it is held as an established fact that excessive reproduction destroys or impairs vitality, not only as regards the vegetable but also the animal economy. Many of our seedling apple trees have never been properly pruned, or pruned at all, during all their growth, and have arrived at maturity with a great crowd of branches, a compact, bushy head, and will produce but little and very small inferior fruit. Such trees should not be suffered to remain in any orchard, unless quite sound and healthy, when new tops of choice varieties could be given them by grafting.

It is well known to all experienced fruit growers that those varieties that have open heads—as the Domine, Stanard, Holland Pippin, Wine *Sap*, Minker, and many others produce fair annual crops, and, all things considered, are much the most reliable and profitable; whilst those of more compact bushy heads, as the Lowel, Northern Spy, Winter Russet, Yellow Bellefleur, and all others of this class are inclined to produce biennial crops, with a strong tendency to overbear. The plum and cherry are seldom pruned. At Alton, Ill., "Dr. Hull trims out the heads of the peach, and removes the fruit from all twigs that *fall below a horizontal line*. His fruit is the largest sent to market and commands the highest price. Others cut back so as to thicken the head of the tree, and to protect the fruit from the direct rays of the sun; while all parties *thin out the fruit*. Thus far there has been about the same success with both the above plans; one producing the most fruit, and the other commanding the highest price."

When the fruit is about the size of a grape or small hickory nut, "bring out the ladders" and relieve those trees that are overburdened. Some may require half the crop to be picked off—others less. The orchardist will exercise his own judg-

ment as to the proper quantity to be taken away. Persons inexperienced in this business might suppose it an endless job to go over the orchard for this purpose; but such should recollect that in many cases not more than one-fourth or one-eighth of the trees will require such treatment; and, that the work can be done in at least half the time required to go over as many trees, picking the matured fruit for market or home use. Thin all those fruits that are too numerous. By the inosculation of the vessels of vegetables, when any parts of a tree are destroyed, those in their vicinity become more vigorous. On this account, when part of the fruit is taken away as early as may be, the remaining part acquires more nutriment. Add to this, that when the fruit is crowded, some of it becomes precluded from the sun and air, and in consequence does not perfectly ripen, and in some situations is likely to become mouldy; for mould is a vegetable production, which, like other fungi, does not require either much light or air, as appears from the growth of some fungi in dark cellars, and of common mushrooms beneath decayed beds of straw.

The following extract from a good English author, although a digression and not applicable in every respect to apple culture, is, nevertheless, valuable and worthy of insertion here.

“Give additional moisture, manure and warmth during the early part of the growth of fruit. By additional moisture the fruit becomes larger; in hot houses, this may be effected two ways, one by watering the earth on which the vegetables grow, and another by producing steam by watering the warm flues or floors; which will afterwards, in the cooler hours, be again condensed, and settle in the form of dew on the fruit and leaves.

“By supplying vegetables as well as animals with an abundance of fluid, they are liable to increase in bulk, both because of the external cuticle, which confines the growth of both of them, becomes relaxed, as is seen in the hands of those women who for many hours have been engaged in washing; and also because the cutaneous absorbent vessels will thus imbibe more fluid from the external surface; and the cellular absorbents

will therefore imbibe less from the internal cells, and consequently more mucus or fat will remain in them.

“Thus in Lancashire, where premiums are given for large gooseberries, I am told that some of those who are solicitous for the prizes not only thin the fruit of a gooseberry tree, so as to leave but two or three gooseberries on a bunch, then by supporting a tea saucer under each of these gooseberries, bathe it for some weeks in so much water as to cover about one-fourth of it, which they call sucking the gooseberry.

“There are two circumstances to be attended to in giving water to plants or trees; which are, not to water them during the hot part of the day in Summer, nor in the evenings of Spring, when a frost may be expected; in both these circumstances we may be said to copy nature, as the rain is generally preceded by a cloudy sky, and is never accompanied by frost; though that sometimes follows it, and is then very injurious to vegetation.

“When plants have been long stimulated by a hot sunshine into violent action, if this stimulus of heat be too greatly and too suddenly diminished by the affusion of cold water, or by its sudden evaporation, their vessels cease to act, and death ensues; exactly as has too frequently happened to those who have bathed in a cold stream, or spring of water, after having been heated by violent and continued exercise on a hot day. When severe frosts follow the watering of plants, they are rendered torpid, and die by the too great and sudden diminution of the stimulus of heat; which is equally necessary to the activity of vegetable as to animal fibres; and in some instances the circulation of their fluids may be stopped by the congelation of them; and in others, their vessels may be burst by the expansion attending the conversion of water into ice; or, lastly, by the separation of their different fluids by congelation.

“When an addition of manure can be procured, as where the black carbonic juice from a dung hill mixed with water, or soapsuds, which have been used in washing, can be employed instead of water alone, it must undoubtedly add much

to the nutriment, and consequently greatly enlarge the size and add to the quality and flavor of fruit by that means, also, as well as by the additional water."

In an article entitled "The Golden Age of Fruit Culture," the *Rural Annual* remarks: "We may as well add in this connection, that much may be done by way of restoring the former smoothness of specimens, if the *proper thinning out at the right time*, is adopted. Yonder, for instance, is an apple orchard at mid-Summer—most of the trees have twice as many specimens growing upon them as they can develop at full size and maturity with full flavor. It will be found, also, that one-half or two-thirds of them are wormy or knotty. All that the owner has to do, therefore, is to thin out all that are bad or defective. He will do this many times more rapidly than gathering the fruit, because he has to take no pains with them. His crop will then be left in an excellent and fair condition, and be far more saleable than if disfigured by an intermixture of scrubs. These remarks will also apply to pears and peaches, with the addition that they are more likely to be stung and rendered knotty by the curculio than the apple."

The taking off all that are wormy or knotty might not be sufficient, as those trees that are much crowded would not be sufficiently relieved, and, the part remaining might be still too numerous to allow fine size and flavor; consequently, the good judgment of the owner, or orchardist, would, in such cases, require him to still farther reduce the crop, even to one-half.

It is not to be denied, notwithstanding what has been said about over-bearing, and its remedy, "picking off"—that many orchards bear remunerative crops without any such assistance, and, are *naturally relieved* of their superabundance of fruit, by the most vigorous specimens crowding off and starving the weakly ones. This, in some degree, is always the case—but still enough may remain to exhaust the energies of the tree and cause the fruit to be unfit for marketable purposes. The trees may be broken and fatally injured, however, by the leverage and weight of fruit, and the fruit rendered very inferior in many cases, yet the great abundance of the crop—

the use that may be made of it in this condition, in drying, and other domestic purposes, such as making cider, brandy, and for feeding stock, may be considered by some as a sufficient equivalent for the care bestowed upon the trees without including thinning out.

But there is another consideration that should not be overlooked. Trees whose fruit are properly thinned and regulated, become, as a general thing, annual bearers when thus treated; whereas, if they are entirely neglected in this regard, their over-bearing is apt to cause biennial crops only—and the products of every other year are almost entirely lost; and, indeed, some trees, if suffered to mature a very heavy crop, will not bear again until the *third year*, and consequently two years are lost.

GENERAL REMARKS ON THE CULTIVATION OF THE APPLE.

We have thought proper to append the following practical article on “Apple Culture,” from the pen of an experienced Albemarle county, Virginia, farmer, (Professor J. Dinwiddie, late of the University of Virginia,) as the sum and substance of the entire art and science of apple culture. His views on this subject so nearly correspond with those of the author, and are so comprehensive and well written, that we gladly substitute them for the general remarks we had intended to have used in closing this part of our work:

“Having been for many years actively engaged in the collection, preparation, and cultivation of fine kinds of fruits, such as are best adapted to the soil and climate of the eastern base of the Blue Ridge mountains in the States of Virginia and of North Carolina, we believe that we can pen some plain, practical information upon the cultivation of fruits which will be useful to those who may desire to engage in this most pleasant and profitable business. The apple, pear, peach, cherry, and grape are the great fruits naturally adapted to the soil and climate of this section of country, and are most profitable to the cultivator, and so easy of cultivation that every farmer should have a choice and well-selected collection of

them. The farm that has not growing thereon a large and well-selected orchard is not a place fit for man to live at; and we say most emphatically to every farmer who has not a good orchard, go to work at once and supply the greatest deficiency on your farm. Plant and cultivate fruits for market and for home consumption. The wife can have prepared for the table many a tart and savory dish in which fruit will constitute the main ingredient. The children will fairly dance over a basket of ripe, ruddy fruit. The horses, the cows, the pigs, and the fowls, are all fond of the product of the orchard, and it is good and wholesome for all. Do not say that you are too old now to plant an orchard. It would be a splendid legacy to bequeath to those who are dear to you. Do not say that you expect to sell out your farm, and therefore would not get the benefit thereof; but if you do really wish to sell out, then go to work at once and plant out a large orchard, and make yours a place fit to live at, and if you still desire to sell out (which we doubt if you do), you will not only find a purchaser, but realize a handsome profit on the investment. Do not say that you have not the money to spare to buy the plants to start the orchards, but sell a horse, or cow or two, or even a corner of your large domains, to make the investment. Do not say that it will be too long to wait before these young plants will fruit in the orchard. Your seedling trees, that have accidentally sprung up about your farm, will give you no idea how soon you may obtain fruits from fine cultivated varieties; and look around you and see if some neighbor did not plant a few trees just before the war, and if he has given them proper attention, hear him now talk about the golden fruit, and ask what he would take to have those fruit trees removed from his farm. In fine, make no excuses whatever, but determine that the orchard shall be set in the approaching season, and if you have made no choice collection of varieties of fruits yourselves, and are not skilled in the propagation of these plants, then send your orders at once to some reliable nurseryman. The apple is the great fruit of all fruits in the temperate zone. By a judicious selection of kinds to ripen in succession, it may be had in perfection the whole year

round; and as our space is limited, we will make the apple a specialty in this article: In order to grow an orchard of fine thrifty apple trees, which will produce an abundance of fine fruit, after obtaining the necessary kinds to ripen in succession—of which we will speak more fully hereafter—we must commence with the starting of the young plants, and inquire what kind of material has been used by the propagator, what mode has been practiced in the propagation, and whether or not this material has been collected in a favorable or an unfavorable fruit growing locality. The stock and the graft are the material, and the mode is to insert the graft into the stock either above or below the surface where the union is to take place. Now, if the material to start these plants has been collected and cultivated in an unfavorable locality for the apple, we cannot hope for high perfection, but feeble trees, imperfect fruit, and even death itself at no distant day, must inevitably be the result. If the grafts have been cut from water-sprouts, or the lower branches of the parent tree, that is also objectionable, even in favorable localities; because the water-sprouts are too long in fruiting, though fine growers. The lower branches make poor, crooked-growing trees, although the first to fruit. The mode of grafting, in common seedling stocks, above the surface is a bad one, because some kinds of apples are much more vigorous than other kinds are, and when it happens to be the case (which occurs as often as otherwise) that a graft of rapid growth is inserted above the surface into a stock of small and uncertain growth, the stock is not vigorous enough for the head, it is an ill-assorted union, and will never do well. But if we wish to grow fine trees that will produce the best fruits, we must choose for the parent tree a fine, thrifty, young-bearing tree, in a favorable locality, and cut from it the main leaders, only for the scions, and insert them into healthy seedling stocks about four inches below the surface, where the soil is deep and loamy, and new roots will spring out of the scion itself above the union of the stock. Graft in this way, and if there be great inequality in the growth of the stock and graft, the graft will maintain itself from its own roots. When the plants have been nicely culti-

vated in the nursery rows two years, they are ready for transplanting into the orchard. They will then be from four to six feet high, which is the best size to transplant; for small size plants, with an even balance of fibrous roots, which they should have, are transplanted with much less labor than large ones. They take a deep and firm hold in the ground, are not shaken and careened by high winds when clothed with foliage in Summer time, as large-sized newly-transplanted trees are; and lastly, the small-sized trees will often push up rapidly, soon overtake and shoot far ahead of the large ones if the large ones are not well attended to. Every side branch should be removed at transplanting, and the main stem cut back to three or three and a half feet from the roots, the topmost buds, two or three, as it may be, will push out rapidly, and soon the head will be formed. If only one bud (which is not often the case) starts out, it should be pinched off to three buds on the new growth. But we are getting along too fast, not having given due importance to the preparation of the borders and the transplanting. We prefer a thorough preparation of the whole soil in the plat by the plow and sub-soiler, if the soil is not naturally deep, to the digging of large holes, which is too laborious, and when holes are dug, the trees are almost certain to be transplanted too deep, which is a great error with many who are not experienced. We take a turning plow, two or three horses, and plow out the rows in the fallowed land, running two or three times in the same furrow, at from thirty to thirty-five feet distance; then cross in like manner; then scrape back the mellow soil a little from the cross, and spade out about a bushel of the clay and fill in until nearly full with mellow soil, shaping to suit the roots of the plant. Set in the plant, straightening out the roots to their natural position, working the fine dirt well in about the starting out of the roots, being careful to have the plant when the earth settles no deeper than it grew in the nursery. Trees thus planted require no staking, which would be a disadvantage, aside from the labor it would require. Keep the soil mellow and loose about them as you would about corn, adding a little surface manure of almost any kind, working it in occasionally; and,

be assured, you will gather fruit there in a very few years. Prune thoroughly for the first four or five years by thinning out the heads of the trees, by cutting out all crowded and crossing branches; shape to the form of a pyramid by preserving a main leader, and cutting back all rambling side branches. This may be performed at any time that you may be passing, and with no greater weapon than a pocket-knife and by pinching with the forefinger and thumb. A little judgment and experience will soon enable the fruit grower to understand this performance. What kinds to cultivate is, perhaps, the most puzzling question (even to the experienced orchardist) in the whole matter, although there are hundreds of kinds of apples of high reputation in certain localities, described and figured in the catalogues of nurserymen, and recommended for general cultivation. It does not hold good that any kind of apple that has succeeded in some particular locality will suit at all the soil and climate of another; for instance, experience teaches us that almost all northern apples of high reputation—that is, those kinds that have had their origin in the North—are comparatively worthless when cultivated as far south as Virginia. There are only a few kinds of Summer and Fall apples from the North that have done well with us. Their finest winter apples are not to be relied upon at all as late keepers here. Their Winter apples become Fall apples here, and their Fall apples become late Summer apples, and their Summer apples ripen much earlier here than there. The “Early Joe,” from the State of New York, is a Summer apple of superior excellence here. The “Mother” apple, from Massachusetts, is a delightful Fall fruit here, and some of their Winter apples—such as “Northern Spy,” “King of Tompkin’s City”—are fine Fall fruit here; and there are some foreign varieties—for instance, “Red Astrachan,” “Yellow Bellefleur,” &c.—which have proved to be very good here.

“Climate, soil, and situation exert a mighty influence, not only over the apple alone, but every other species of fruit. This is very apparent to any careful observer in any neighborhood, even here in this fine fruit growing section of country. For instance, the “Albemarle Pippin,” transplanted

outside of its natural home, a good, rich mountain loam and elevated position, is not worth cultivating; and, on the contrary, the "Wine Sap," and many other kinds, thrive best on least elevated places, and in a soil of a different description. Almost every neighborhood in this favored section has one or more fine natural kinds which have sprung up from seed, and it is upon these that we must build our hopes, especially for late keepers; and we are happy to say that we have some natural productions that far excel in form, color, and high flavor any thing that we have seen that came from the North or from Europe.

"As I said that the apple was the great fruit of all fruits, the "Pilot Apple," a natural seedling of Nelson county, Va., is the great apple of all apples in our acquaintance. The tree is a magnificent grower, apparently hardy as an oak. The fruit is large, handsomely formed, and of the finest flavor, both for the dessert and for cooking. But, to close this article, already long, I will name a few kinds that have proved best with us, and will name them in order as they ripen: Striped July, Early Harvest, Red Astrachan, large Yellow Bough, American Summer Pearmain, Fall Pippin, Annate Apple, Fall Cheese, Yellow Bellefleur, Mother Apple, Vandevere of New York, King of Tompkin's City, Northern Spy, Raule's Genet, Pilot Apple, Albemarle Pippin, Wine Sap, Limbertwig, Father Abraham, and Black's Hardtimes.

"J. D.

"P. S.—As to the best time to transplant, I would say any time that the ground is in good working order, from the fall of the leaf to the putting forth of the buds—a damp day to be preferred.

J. D."

WARNING.

In the selection of varieties, the orchardist should be influenced by the climate of his location. The climates, even of the South, differ very much. The reputation of many fruits will greatly depend on their location. What may be strictly true of a fruit raised in the Valley of Virginia, may be as strictly false of the same variety if grown in the maritime dis-

tricts of Georgia or South Carolina. In the one case, it may be of the very best quality, and in the other, entirely worthless.

In the following Lists of Apples, the author has taken much pains, perhaps more than any other author, to impress upon the pomologist the importance of judicious selections of varieties, so that he may exercise proper discrimination—for his success or failure depends, in a great degree, on careful selection. Our nurserymen are, generally, reliable and intelligent, and those who design planting an orchard would do well to consult those nearest their location, and patronize the nursery whose soil and climate come nearest to that in which the trees are to be planted.

It is seldom necessary or profitable to plant a great number of varieties—only the amateur can afford to do this; but confine your choice to a few of the *very best* varieties for each season, however large may be the orchard, which, from the best information you can get, are adapted to your locality.

SOUTHERN AND WESTERN APPLES—REVISED CATALOGUE.

Selected from the Catalogue of the Committee of Revision, presented and accepted at the meeting of the American Pomological Society, held at Richmond, Va., in September, 1871.

	Use.	Season		Use.	Season
Am. Summer Pearmain.....	*	F. S.	Maiden's Blash.....	**	K. M. E. A.
Albemarle Pippin.....	**	F. M. W.	Mason's Stranger.....	*	F. M. W.
American Golden Russet....	*	F. M. W.	Mangum.....	**	F. M. W.
Ben. Davis.....	*	K. M. W.	Michael Henry Pippin.....	*	K. M. W.
Brooke's Pippin.....	*	F. M. W.	Milam.....	*	K. M. W.
Danver's Winter Sweet.....	*	F. M. W.	Nickajack (of forty names)...	**	F. M. W.
Dutchess of Oldenburg.....	*	M. S.	Ortley.....	*	F. M. W.
Carolina Red June.....	**	F. M. S.	Pryor's Red... ..	**	F. M. W.
Cannon Pearmain.....	**	F. W.	Red Astrachan.....	*	K. M. S.
Early Harvest.....	**	F. M. S.	*Rawles' Genet (worthy **),	*	F. M. W.
Early Red Margaret.....	†	F. M. S.	Romanite, of the South.....	*	F. M. W.
Early Strawberry—Red Ju- neating.....	*	F. S.	Shockley.....	**	F. M. W.
Domine.....	*	F. M. W.	Smith's Cider.....	*	F. M. W.
Fall Queen—Buckingham, Bateholer.....	**	F. M. A.	Smoke House.....	*	K. M. W.
Fall Pippin.....	†	M. L. A.	Summer Queen.....	*	K. M. S.
Fallwater—Tulpehocken.....	**	M. W.	Summer Rose.....	*	F. S.
Gilpin—Cart House.....	**	F. M. W.	Waugh's Crab (Cider).....	*	W. W.
Gravenstein.....	*	F. M. L. A.	Wellford's Yellow.....	*	M. W.
Green Cheese.....	†	F. M. W.	White Juneating.....	*	F. M. S.
Hewe's Va. Crab—(Cider)....	*	L. A. W.	Wine.....	*	F. M. W.
Horse.....	*	K. M. S.	Wine Sap (has a wide range)...	**	F. M. W.
Junaluskee.....	†	F. M. W.	Winter Sweet Paradise.....	*	F. W.
Loudon Pippin.....	*	M. W.	Yellow Bellefleur.....	*	F. M. W.
Large Yellow Bough.....	*	F. M. S.	York Imperial.....	*	F. M. W.
Lawyer.....	†	F. M. W.	Pilot.....	†	M. W.
Limb-rtwig.....	*	M. W.	Highly Sweet.....	†	F. L. A.
McAfee's Nonesuch.....	**	F. M. W.	Baltimore.....	†	F. M. W.
			Grimes' Golden Pippin.....	†	F. W.

One * designates recommended.

Two ** gives the character of superiority for family and market use.

The † indicates varieties that have been on trial not less than 5 years.

F.—Family use.

F. M.—Family and Market.

* This fine French apple was introduced and named by Mr. Jefferson, and was first naturalized in Albemarle county, Virginia. Mr. Jefferson obtained the scions during the administration of Washington, through the French Minister, *M. Genet*, whilst he was Secretary of State. The scions were placed in the hands of Mr. Rawles, of Virginia, a nurseryman by profession, and were disseminated throughout this State and Kentucky. The name has been mis-spelt in various ways. It should be R-a-w-l-e-s' G-e-n-e-t. We get the most of this information from the 13th Report of the American Pomological Society.

NEW APPLES.

The following list of new Southern apples was favorably spoken of by the Committee on New Fruits at the 13th session of the American Pomological Society, held at Richmond, in September, 1871. The most of these fruits were winter varieties, and the specimens unripe:

Mason's Stranger. Unripe, Brunswick county, Va., (by J. R. Jones.)

Eight other unnamed seedlings, all unripe, same county and State, (by the same.)

Pilot. Unripe, Nelson county, Va., (by the same.)

Seedling. Fair looking, Nelson Co., Va., (by G. W. Purvis.)

Dinwiddie. Unripe, Albemarle county, Va., (from W. W. Dinwiddie.)

A seedling. Unripe, fair looking, Albemarle county, Va., (from the same.)

Via. Good, Albemarle county, Va., (by Dollins & Bro.)

Yancy's Prize. Good to very good, Albemarle county, Va., (by the same.)

Matilda. Good to very good, Albemarle county, Va., (by the same.)

Ragland. Very good, Albemarle Co., Va., (by the same.)

Brown's Seedling. Rockbridge Co., Va., (F. Davis & Co.)

Seedlings. Some fair looking, but all unripe, Rockbridge county, Va., (B. H. Jones.)

TIDE-WATER REGION—VIRGINIA.

ISLE OF WIGHT COUNTY.

List furnished by Dixen W. Kitchen.

EARLY SUMMER.—May apple, Yellow June, Princess' Harvest, Hagloe, Red Astrachan, Gravenstein.

SUMMER.—Horse apple, Orange Pippin, Cathead, Sheepnose, Pound apple, Gregory's Red.

AUTUMN.—Wine Sap, Gordon's Seedling, Baltimore Red, *Fallwater* (Tulpehocken), Limbertwig, Beaman's Seedling.

WINTER.—Large Vine, Isaac, Matimuskite, Nansemond Beauty, Ridley, Golden Pippin.

For cider and brandy, the Gregory and Horse apple are the most approved.

The above list, furnished by an experienced orchardist, who grows the fruits he recommends, is valuable, being adapted to the Tide-water regions of Virginia and North Carolina.

LIST OF EARLY BEARING VARIETIES.

The following varieties are generally very early bearers, and, in order to sustain vigorous growth in the young trees, the fruit in many cases will have to be thinned out when a little less than the size of a hickory nut:

Juneating, white, long stem, (earliest Va. apple); *Golden Dixie*—This is a new variety from seed, originated in the seedling orchard of the author of this work. It is a large bright yellow, crisp, juicy, sub-acid, tender apple, matures in August, and will be propagated in the Nursery and Experimental Orchards of the Hermitage Nurseries, Richmond, Va., by Mr. John M. Allan; *Smith's Cider*; *Sweet June* (or High Top Sweet); Early Pennock; A. S. Pearmain; Fall Wine; Fall Queen; Fameuse; Lowell; Monte Bello; Ben. Davis; Domine; Jonathan; Limbertwig; Ramanite; Wine Sap; Catline (Coxe, Thompson), *Gregson Apple*; Summer Sweet Paradise (August and September); Ramsdell's Sweeting (October to February).

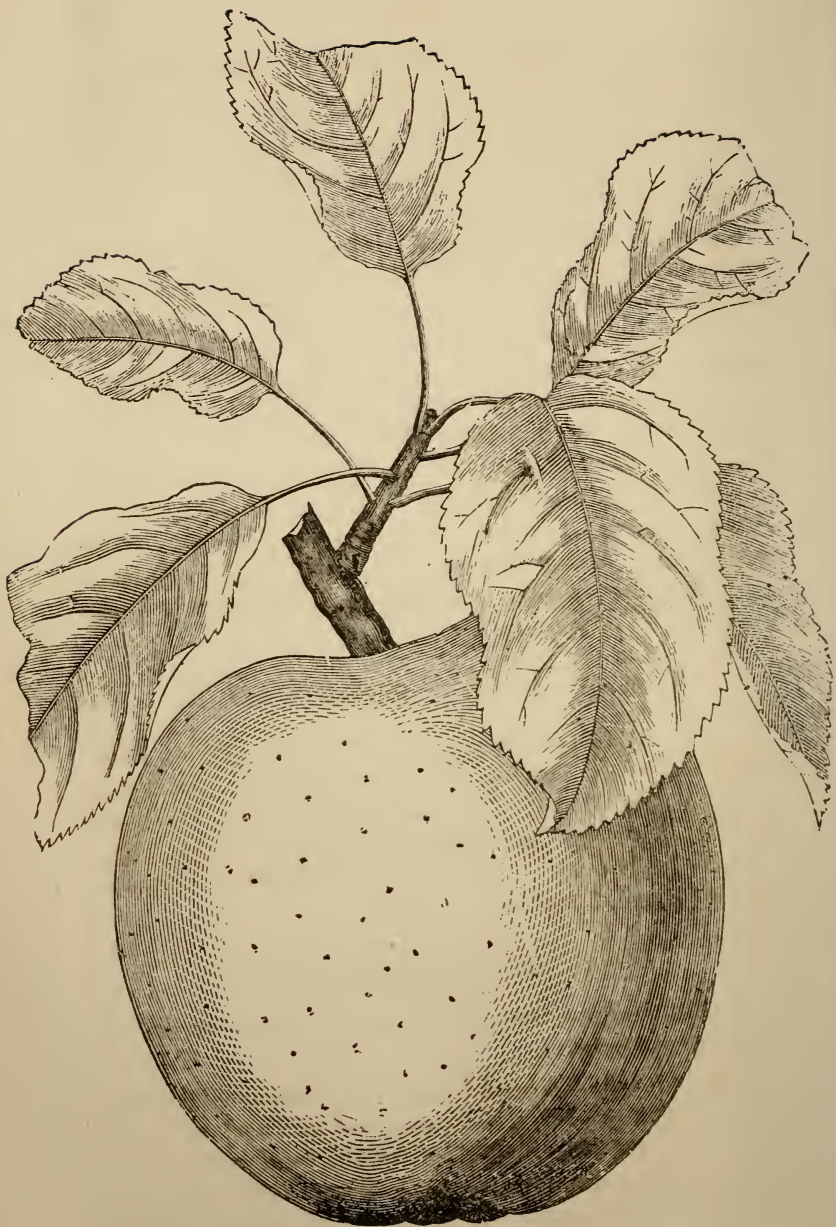
LIST OF APPLES FOR SANDY SOILS.

Yellow Bellefleur, finest quality; Morris' Winter (Hanover, Va., new); American Summer Pearmain; Rambo (a native of the banks of the Delaware); Winter Pearmain (Coxe); Pearmain, Herfordshire; Vandevere; Wine Sap; Cooper's Russeting (cider); Minister; Peck's Pleasant; Priestly (Coxe, Thompson).

VARIETIES FOR SLATY SOILS.

The following varieties originated in slaty soils, or are well adapted to such soils:

Roman Beauty—A good fall and early Winter apple; large, yellow and bright red, bears young and full and regularly, one of the best, (Ohio); *Golden Dixie*; large, yellow Summer apple, best, (already described); *Winter Pearmain* (Coxe); Herefordshire Pearmain, (Thompson); *Wine Sap*, (standard); *Cooper's Russeting*, (Coxe), cooking or cider. It makes



YELLOW BELLEFLEUR APPLE.

exceedingly strong cider; *Tyler's Rennet*, (new), Virginia—late Summer, of very superior quality.

CIDER APPLES FOR GENERAL CULTIVATION.

Wine Sap; Wine Apple; Hewe's Virginia Crab; Hagloe Crab, (early cider and vinegar); Cooper's Russeting, (sandy soils); Gilpin, (Carthouse), Virginia apple, good, very productive; Harrison, ten bushels make a barrel of cider, good; Campfield, next to the Harrison; Smith's Cider, medium to large, also fine for cooking; French Crab, productive, makes fine cider; Rawles' Genet, late, productive; Red Streak, handsome grower and great bearer, (English.)

APPLES FOR PRESERVING OR FOR ORNAMENT.

Siberian Crab—Rich and beautiful.

Large Red Siberian Crab—Large tree, highly esteemed.

Yellow Siberian Crab—Larger than the red, highly esteemed.

Chinese Crab—Double flowering, showy blossoms and fruit.

Hyslop's Crab—Large, deep crimson, very popular at the West.

Transcendant Crab—Very beautiful, red and yellow, tree strong grower.

Golden Beauty, Crab—Medium size, yellow, with red cheek; beautiful.

SELECT LIST OF APPLES FOR SMALL ORCHARDS OR GARDENS.

FOR GENERAL CULTIVATION.

WINTER.—Albemarle Pippin, (Va.); Wine Sap; Fall-water; Gully, (South Carolina); Nickajack, (Southern); Pilot, (Nelson Co., Va.); Pryor's Red; Grims' Golden, (annual, best); Sweet Genet, new, (escapes frost); Swaar; Rawles' Genet; Limbertwig; Hubbardston Nonesuch.

FALL.—Gravenstein; Yellow Bellefleur, (Nov.); Powers, large, beautiful, (Ohio seedling); Dominie; Fall Pippin;

Rambo; Maiden's Blush; American Golden Russet; Porter; Baldwin; Smith's Cider, good for all purposes; Mote Sweet, sup. new, from N. C. seedling; Celestia, very best, new, from N. C. seedling.

SUMMER.—White Juneating; Red Astrachan; Early Harvest; Early Margaret; Bough, large sweet; Red June; Golden Dixie, best, new; Summer Queen; Caroline June, red; Benoni; Sweet June; Sops of Wine.

LIST FOR THE TIDE-WATER OR MARITIME DISTRICT OF THE SOUTH.

SUMMER APPLES.

Bough, Large Sweet, July and August.

Early Harvest, June and July.

Red Astrachan, July to August.

Sweet Bough, during August.

Early Red Margaret, about first July.

Red June (Carolina Red), June and first July.

Large Yellow Bough, July and August.

Summer Queen, first of August.

White Juneating, middle to last June.

American Summer Pearmain, high flavored, splendid.

Golden Dixie, this is a splendid, large, tender, yellow, apple; August, origin Albemarle Co., Va.

Hagloe, (Coxe), superior for table and for cider, ripe in August.

Julian (Southern variety), yellow and crimson, medium size, high flavored, very promising, August.

Summer Sweet Paradise, large, pale green, tinged with yellow, very good, August.

Sweet June, (High top sweet), yellow and red, very good, June and July.

AUTUMN APPLES.

Bellefleur, Yellow, November, (February in the Valley of Virginia.)

Dominie, November, late Fall.

Fall Pippin, September to November.

Rambo, late Autumn, best.

Smith's Cider, November, cooking and cider.

Catline, (Coxe, Thompson), native of Maryland, first rate, late Fall.

Fall or Holland Pippin, one of the finest and most beautiful apples, (European.)

Smokehouse, large, roundish striped, fine quality, November.

Maiden's Blush, medium size, pale yellow, with red cheek, tender and pleasant, beautiful.

Gravenstein, very large, striped, first quality, September.

Vandevere, (Coxe, Thompson, Floy.), Oxeye of Ohio and Indiana; a native of Wilmington, Delaware. When in perfection is one of the most beautiful and finest of apples; large and roundish yellow ground, marbled with red, flesh yellow crisp, tender, with a sprightly flavor, flourishes in a light, rich, sandy soil.

WINTER APPLES.

Dominie. First class, early Winter, richly flavored.

Fallwater. Best; November to January.

Carthouse or Romanite. December to April, (for Virginia and the Carolinas.)

Jonathan. Productive, tender, juicy; November to March.

Limbertwig. Good grower and bearer; January to April.

Nickajack. Large, tree very robust, long keeping; Southern apple.

Pilot. (Origin Nelson Co., Va.,) first class, new, worth trying.

Pryor's Red. Old, first-class, (Virginia); Nov. to March.

Pomme D'Api, or *Lady Apple*. Nov. to May; celebrated.

Rawles' Genet. Never fail, one of the best, escapes frost; December to April.

Vandevere. Most beautiful; rich, light sandy soil.

Waxen Apple. Eastern Virginia (Coxe), skin yellow, vermillion blush, waxy, tender; November to February.

Wine Sap. Good in most soils and situations, especially those of light sandy texture.

Cooper's Russeting. Splendid cider apple for sandy soils ; November.

Gilpin. A handsome cider fruit from Virginia (Downing), February to May.

Hewe's Virginia Crab. An unsurpassed cider apple, makes a bright liquor, keeps all Summer.

Harrison. The celebrated cider apple of New Jersey, ten bushels make a barrel of cider.

Peck's Pleasant. Large, clear yellow, red in the sun; gravelly soils; early Winter.

Baldwin. Large and fine, does well in most situations.

Woolman's Long or white Bellefleur. (Southern portions of the West); great bearer.

American White Winter Calville. Large, pale yellow, (origin Virginia); December to May.

Mason Pippin. (Origin Brunswick Co., Va); new, beautiful, large; December to April.

Wine Apple. (Downing); handsome table and cider fruit.

Dutch Magnonne. (Downing); magnificent, delicious; November to February.

Buff Apple. Succeeds well in North Carolina; high recommendations from Buncome Co.

Gully. (South Carolina); splendid, November to March.

Swaar. Very fine, rich deep sandy soil; Winter.

Spitzenburg. Rich and excellent; November to February.

Grimes' Golden. (Grimes' Golden Pippin); an apple of the highest quality (Va.); November to May.

LIST FOR THE MOUNTAINOUS SECTIONS OF THE SOUTH.

Including the Piedmont Region of Virginia, and corresponding portions of Maryland.

SUMMER APPLES.

Summer Queen. Large, conical, striped with red, very rich, high flavor; July and August.

American Summer Pearmain. Medium size, smooth skin, tender and juicy; September.

Early Harvest. Medium, pale yellow, sub-acid, best early, market apple.

Astrachan Red. Large, nearly covered with deep crimson, juicy, rich; July and August.

Golden Dixie. Originated in Albemarle Co., Va., large, bright yellow, flesh white, crisp, juicy, rich, very superior; August.

Bough, Large Sweet. Large, pale yellow, sweet rich flavor; July and August.

May Apple. Small, round, pale yellow, sub-acid; June in Virginia; for South.

Summer Rose. Rather small, yellow with red cheek, flesh tender; June and July.

Early Margaret. Medium to small, bright red, crisp juicy; July.

Early Strawberry. Medium, striped with deep red, tender, sub-acid; July and August.

Summer Pippin. Rather large, yellow, flesh white, juicy, tender; August.

Keswick Codlin. Large, oblong, pale yellow, acid, excellent for cooking; July to October.

Red Juneating, Red June, or Carolina Red. Small or medium, deep red, good, hardy; June and July.

Striped Juneating, sometimes called Red Margaret. Believed to be distinct, best quality.

White Juneating. Small, yellow, faint blush, flesh white, crisp, great bearer, earliest, June.

Early Ripe. Large, oblong, yellow, tender, juicy, sub-acid, productive; early July.

Woolman's Harvest. A handsome striped apple, fine flavor; ripens early in July.

Golden Sweet. Large, medicinal, round, pale yellow, flesh tender, sweet and rich; August.

Spice Sweet. Large, flat, smooth, pale yellow ground, bright red; early in August.

Summer Bellefleur. Large, handsome, a good grower and bearer; August.

Julian Summerour. A fine apple cultivated in Habersham Co., Georgia.

Early Joe. Fruit medium, color pale yellowish green, mixed with stripes and splashes of dark red, flesh yellowish white, tender crisp. Most delicious of all Summer apples.

Summer Sweet Paradise. Large, roundish, pale green, sometimes tinged with yellow in the sun; flesh crisp, tender, very juicy, with a sweet, rich aromatic flavor; tree a moderate grower and great bearer; very good; August.

Cole's Queen Apple. Large to very large, flatish conical, bright yellow, flesh when first ripe, firm, juicy, pleasant acid; when mellow, remarkably tender, of a mild rich quince flavor, and aroma; July to September.

FALL APPLES.

Alexander. This is a magnificent Russian apple—fruit large, superb; beautiful large blossoms; January.

Rambo. Medium, round, greenish yellow, tender, juicy and pleasant; October to January.

Dominic. Medium, flat, greenish yellow, sub-acid, juicy and rich; late Fall and early Winter.

Bellefleur, Yellow. Large, oblong, yellow, with a blush—rich; late Autumn.

Beauty of Kent. Very large, striped with red, juicy, crisp, tender; October.

Butter. Rather large, striped with red, sweet, best cooking; September.

Gravenstein. Large, roundish, striped with red, tender, juicy, rich, best; September.

Fall Pippin. Very large, smooth skin, yellowish green, very best; September to December.

Baldwin. Large, mostly colored with red, crisp and rich, first class; November and December.

Maiden's Blush. Medium to large, pale yellow, with carmine blush, tender, sprightly; August to October.

Red Streak. Medium to large, round, yellow striped, tinged with red, juicy, pleasant; October to December.

Smokehouse. Large, oblate, striped with red, firm, juicy, crisp and rich; September to December.

Red Siberian Crab. Already described; last September and October.

Yellow Siberian Crab. Already described; October.

Sweet Red Streak. Medium, striped with red, sweet flavor, very productive; September to December.

Porter. Rather large, bright yellow, tender crisp, sub-acid; September and October.

Rhode Island Greening. Large, green, popular apple; November.

Vandevere. Above medium, striped yellow and red—rich, good bearer; last of October to December.

Robinson's White. Medium, crisp, juicy, highly esteemed; October and November.

Summer Rambo. Large, striped with red, mild, sub-acid; September and October.

Buckingham. Large, skin clear, pale yellow, juicy, sweet, tender, rich; November.

Jersey Sweeting. Best quality—succeeds well in all situations; September to October.

French Crab. Very productive, vigorous grower, fine cider apple.

Hewe's Virginia Crab. The old and popular cider apple of the South.

Smith's Cider. Medium to large—the rival of the Virginia crab—supersedes it in Maryland.

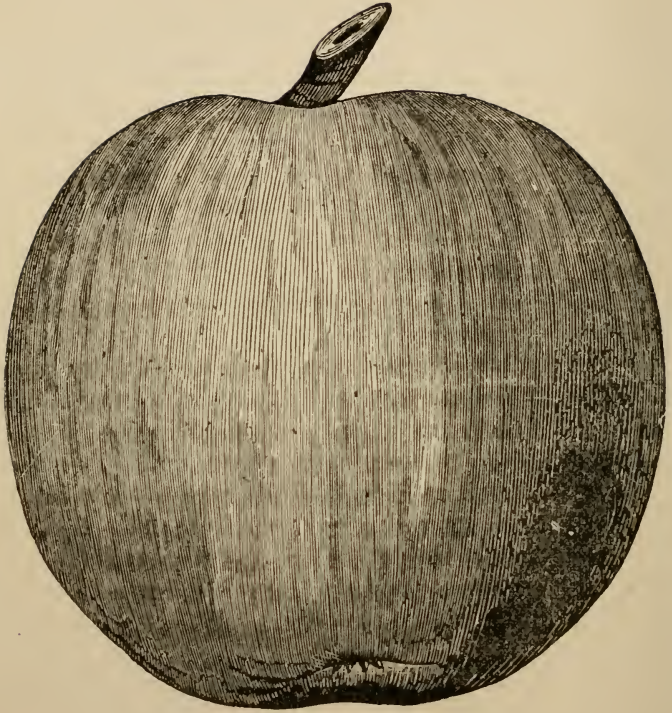
Quince Apple. (Coxe) Large, flatish, yellow; flesh yellowish; juicy, crisp—very pleasant; November.

Goose Pen. Somewhat resembles the Wine Sap, and by no means its inferior; November to March.

Fall Wine. Highly recommended by Ohio Fruit Convention. (No description.)

Abram or "Father Abram." Medium, striped with red—keeps well; April.

Twenty Ounce Apple. (H. Mag.) Downing. A very large, showy apple. It is a good sprightly fruit, though not very high flavored; but its remarkably handsome appearance, and



WINE SAP APPLE.

extra large size, render it one of the most popular fruits in market. The tree is thrifty, and makes a compact head; bears regular crops, and the fruit is always fair and handsome. Fruit very large, roundish, skin slightly uneven, yellowish green, delicately striped, and splashed with red, which on the sunny side quite covers the surface. Flesh not very fine grained, juicy, sprightly, with a pleasant sub-acid flavor.

WINTER APPLES.

Wine Sap. Fruit medium size, roundish, deep red, skin smooth, with few streaks, a little yellow on shady side, flesh yellow, crisp, firm, high flavor, rich. We adopt the language of an eminent Virginia nurseryman,* and say: "We can scarcely find words sufficiently strong to express the high opinion we have of this fruit, possessing, as it does, a combination of so many excellent qualities. For cider, it has but few equals; for the table, it stands among the best; for keeping, it is justly esteemed; and for bearing it scarcely has a rival."†

Albemarle Pippin. "Large, roundish, irregular, smooth, yellowish green; flesh yellow, firm, juicy, aromatic and rich. The great Winter apple of the Piedmont section, but inclined to speck in Tide-water Virginia—does well in some portions of the Valley of Virginia; January to April." Described as above by the President of the Virginia Nursery and Wine Company, Richmond. Mr. Davis says: "We consider the Albemarle Pippin, Newtown Pippin, and Brooks' Pippin as identical. No apple stands higher in the market than this, or brings as high a price. It succeeds finely in the red soil of the mountains and rich valleys of the Piedmont region, and in most parts of the Valley of Virginia. It requires a deep, rich, warm soil to bring it to its highest perfection. (Succeeds admirably in Jefferson and Berkley counties, Va.) Most

* Franklin Davis, Esq., of the Richmond, Va., Nursery.

† Mr. C. T. Botts, of the *Southern Planter*, said, in 1845, "Take it altogether, we believe it is the finest apple that grows in America—and if we were setting out an orchard of a thousand trees, eight hundred of them should be Wine Saps."

fruit growers contend that this splendid apple is *bona fide* an Albemarle County, Virginia, apple.

Pryor's Red. Above medium, reddish russet, rich, and high flavored—a popular old variety in Eastern Virginia, and farther South—a native of Virginia; November to March.

Pomme D'Api, or Lady Apple. A beautiful dessert fruit; November to May.

Rawles' Genet. Already described. Succeeds in most of the West and South.

Nickajack. Large, globular, dull red, sub-acid—tree very robust. A Southern apple, valuable as a long keeping variety; January to April.

Limbertwig. A well known old Southern apple—above medium size, color dull, purplish red, flavor sub-acid, rich, aromatic—tree thrifty and very productive—keeps well; February to April.

Swaar. Large, pale lemon yellow, with dark red dots—rich and spicy—slender grower, moderate bearer, but excellent quality—worthy of general culture; middle of November to April.

Spitzenburg Esopus. Above medium, deep red, with gray spots, rich and excellent—does rather better in the Valley of Virginia and Southwestern States; November to February.

Carthouse, or Romanite. Medium, round, striped, sub-acid and agreeable—an early and heavy bearer—a very valuable variety for Eastern Virginia and North Carolina.

Baldwin. Large, roundish, skin yellow in the shade, with a blush *in red soils*. Nearly covered and striped with crimson—crisp, juicy, rich—succeeds well in the mountains of Virginia and North Carolina; October to January.

White Winter Pearmain. Medium to large, light yellow, tender, rich, mild, sub-acid—tree strong grower and productive; December to March. Also highly esteemed at the West and Southwest.

Winter Sweet Paradise. Large, globular, yellowish white, tender, juicy, very sweet; December to March. A great bearer and fair fruit.

*Lady Apple. Small, glossy, and beautiful. Described farther on.

Yellow Bellefleur. Large, oblong, with a blush on one side—juicy rich flavor. Tree a rapid grower and very productive. In the Tidewater districts, to which it is well adapted, it is a late Fall apple. In the Valley of Virginia it keeps until February or March. It always commands a high price in market. Coxé first described this fruit. The original tree grew in Burlington, New Jersey. We follow Thompson, says Downing, in calling it *Bellefleur*, from the beauty of its blossoms, with the class of French apples to which it belongs. It is well adapted to slaty, sandy, and thrives well in limestone soils.

Ben. Davis. (Kentucky Red Streak.) Large, handsome, striped apple of excellent quality. Tree very hardy, vigorous and productive—a late keeper—highly esteemed in the West and Southwest.

Grimes' Golden (Grimes' Golden Pippin). An apple of the highest quality, equal to the Albemarle or Newtown Pippin—medium to large size, yellow—tree hardy, vigorous, productive; originally from Virginia; grown in Southern Ohio and throughout the South and West; January to April.

Buff Apple. A celebrated North Carolina apple—very fine, large size—much cultivated in Buncombe county.

Cullasaga. A fine apple, cultivated in Habersham county, Georgia.

Mason Pippin. Origin, Brunswick county, Va. A beautiful yellow Pippin, bearing a close resemblance to the Albemarle Pippin, of which it is probably a seedling, and esteemed as equal to it. Medium to large, bright clear yellow; shaded on one side with light russet dots; flesh white, crisp and juicy—rich sweet flavor; December to April.

King of Tompkins County. Large, yellowish, shaded

*This splendid little market apple is popular in Norfolk, London, and Paris. It often commands from \$10 to \$30, when carefully selected and packed, and shipped in fine order. It is well adapted to the upland parts of Maryland, and red land counties of Virginia and North Carolina. All farmers who cultivate for market should give special attention to this beautiful and profitable variety.

with red, splashed with crimson; tender, with a rich vinous flavor.

Abram. Medium, striped with red—flesh rather firm, with an agreeable aromatic flavor—a good bearer, and keeps well; April.

Beverly's Red. Large red, showy, keeps well; quality very good.

Cullasaga. Large, red, high-flavored, vigorous grower and good keepers; January to April.

Jonathan. Medium, roundish, ovate, tender and juicy—skin yellow, covered with bright red stripes—slender growth, but productive; November to March.

Gully. A South Carolina apple—medium size, green, striped with red skin—high flavor and a good keeper; November to March.

Fallawater, or Tulpehocken. Large, greenish yellow, with dull red cheek, slightly conical, juicy, sub-acid—vigorous grower, and *very productive*; worthy of general culture; November to January.

Comak's Sweet. Medium, green, rich, aromatic, crooked, straggling grower; November to May.

Milam. Rather below medium size, smooth, yellow, covered with marbled red and indistinct stripes—flesh white, tender, crisp, juicy; flavor sub-acid, tree a *regular annual bearer*, very productive; November to February. Very popular in the Piedmont district, where it succeeds admirably.

Dominie. Large size, flat, striped with red—flesh white, juicy, firm, mild, sub-acid, sprightly, pleasant flavor; keeps through Winter into Spring; a rapid grower and prodigious bearer. In the Valley of Virginia, and West Virginia, it is a first class Winter apple—deserves extensive cultivation.

Rambo. Medium, round, greenish yellow, striped with red, tender, juicy and pleasant—tree vigorous, erect, and very productive; is one of the best early winter apples for the Piedmont and Valley regions, and stands at the head of the list of Autumn apples in the maritime sections of the South.

Red Streak. “An English apple,—Medicinal; rich, firm, dry, a handsome grower and great bearer.” (Coxe). “A capital English cider apple—it makes a rich, high-flavored, strong liquor, and thrives admirably in this country. Handsome grower and great bearer.” (Downing.) “Medium to large, round, yellow striped, and clouded with bright red; flesh yellow, juicy and very pleasant; November and December.” (Allan).

Romanite or *Carthouse.* Medium size, roundish, oblong, striped, and shaded with deep red on greenish yellow ground; flesh yellow, firm, juicy, rich, becoming tender and sprightly in the Spring; valuable and well adapted to the South—an early and profuse bearer; January to May.

Roxbury Russet. A popular market fruit—excellent—a prodigious bearer, and keeps until late in the Spring. Fruit medium size, sometimes large, roundish, surface rough, greenish, covered with russet—valuable for its long keeping qualities—does not shrivel as some other native Russets, or “Leather Coats” do.

Pilot. A new variety of great promise,* recently disseminated from Nelson county, Va., where it originated, and stands “*par excellence* among apples.” Size large, round, sometimes approaching conical; color, striped with red on yellow ground, overspread with dots and specks of russet; flesh yellowish, fine-grained, crisp and juicy, with a mild, sub-acid flavor; a good bearer, and keeps well and late; December to March.

Pryor's Red. A very large and valuable market apple—well adapted to general cultivation—native of Virginia. (Already described).

Nickajack. An apple of high Southern reputation—fruit roundish, large, skin striped and splashed with crimson—flesh yellow, tender, crisp, juicy, with a fine rich sub-acid flavor; November to May.

*The Pomological Society and Agricultural Societies of this State have awarded premiums for this fine new apple. Its popularity in the Piedmont region of Virginia is unbounded. The original tree is still standing in Nelson county. Mr. Allan, President of the Virginia Horticultural and Pomological Society, says of this apple: “A variety of good promise, recently received from Nelson county, Va., where it originated, and stands *par excellence* among apples.” We give his description of this fine fruit.

Limberrtwig. An old, well known Southern apple: January to June; hardy—will grow in various soils—valuable.

LIST FOR THE VALLEY OF VIRGINIA.

West Virginia, and Southwestern States, including portions of the Western States.

SUMMER VARIETIES.

Early Harvest. Rather large, round, yellow, flesh nearly white, tender, juicy, crisp, with a rich, sprightly, sub-acid flavor; tree very productive—taking all its qualities into consideration, it has no superior amongst early apples; July.

Early Margaret. Medium to small—oblong, bright red, crisp, juicy, sub-acid; tree erect pyramidal form; good bearer—an excellent apple, ripening latter part July, directly after the Early Harvest.

*Golden Dixie.** Large, very bright yellow, sub-acid, crisp, tender, excellent; August.

Astrachan Red. Large, roundish, nearly covered with deep crimson, and thick bloom, juicy, rich, sub-acid—tree a vigorous grower and good bearer; last of July to last of August. This is a fruit of extra beauty; was imported into England from Sweden in 1816.

Early Strawberry Apple. A beautiful variety, which is said to have originated in the neighborhood of New York city—already described; middle of August.

American Summer Pearmain. (Thomp.) A rich, highly flavored fruit—medium size, oblong, nearly covered with streaks and dots of red; flesh tender, juicy and rich; sub-acid flavor, fine, bears early and abundantly; continues in use several weeks; August and September. This is a valuable apple for all purposes; it thrives admirably on moist soils, especially those that are rich and sandy.

Keswick Codlin. Large, oblong, pale yellow, acid—tree erect and vigorous, bears quite young and abundantly—excellent for cooking; middle July to November.

Summer Rose. Rather small, oblate, yellow with red

* Hermitage Nurseries, Richmond, Va.

cheek, flesh very tender, crisp, mild, sub-acid, juicy, excellent—continues in use for a month or more—fine for gardens; later than the Early Harvest; July and August.

Summer Pippin. Medium to large, roundish, yellow green, pink, streaked—irregular, but vigorous grower—productive; August.

Julian.—Medium size, yellow, much covered with crimson, and striped with the same—juicy and high flavored—a Southern variety, promising well; August and September.

Summer Queen. Large, conical, striped with red—flesh yellowish, acid, with a very rich, high flavor—fine for culinary purposes; last of July and throughout August.

Primate. Medium size, greenish-white, with a crimson blush on the exposed side; flesh white, very tender, sprightly, refreshing, mild sub-acid; August and part September.

Bough, or Sweet Bough. Large, pale yellow, sweet, rich flavor—tree, a moderate, compact grower, and abundant bearer—very desirable; July and August.

Williams' Favorite. This is a splendid apple, cultivated in Southern Ohio. Large, oblong-ovate; bright red in the sun; little pale, yellow in the shade—flesh yellowish, white, fine, mild, pleasant, and excellent during all August and part September.

Golden Sweet, or Sweeting. Large, medicinal; round, pale yellow, stem an inch, rather slender, in a narrow, deep cavity—flesh tender, of very sweet, rich, and excellent flavor; September; a good grower and great bearer.

Large Yellow Bough. A large native apple, ripening in harvest time; one of the first quality—only second as a dessert fruit to the Early Harvest—much admired for the table—is worthy of a place in every collection.

Spice Sweet. Large, flat, smooth, pale yellow, very tender, sweet, excellent; September.

White Juneating. Downing says, “this is a very tolerable little apple, ripening about the *very earliest*; last of June and first July; deserves a place in every collection.” Fruit small, skin smooth, first light yellow, with faint blush on sunny side—crisp and pleasant.

Summer Sweet Paradise. Large, roundish, pale green, sometimes tinged with yellow in the sun; flesh tender, crisp, very juicy, with a sweet aromatic flavor; very good; August and September.

AUTUMN VARIETIES.

Fall Pippin. Very large, smooth skin, yellowish green, sub-acid, flesh whitish, very tender, breaking juicy, rich, fine for the table, superior for cooking, moderate in growth. In the southern part of New York, it is the leading Fall apple. This is supposed to be an American variety, Thompson and Lindley to the contrary notwithstanding. The Fall Pippin is a noble fruit, and is considered the first of Autumn apples in Maryland and Virginia; October to January.

Beauty of the West. (Ken.), fruit large, a sweet apple of fair flavor, round and regular. Skin smooth, light greenish yellow, with small red stripes. Flesh tender, juicy, sweet, and pleasant. A Fall apple, but will keep until December.

Dominie. Medium size, medicinal, flat, greenish yellow, red and russet streaks in the sun; stem half an inch long, slender, in a wide very deep cavity, calyx small, in a broad basin, flesh white, very tender, juicy, of a sprightly flavor. In the Valley and Western Virginia, it is a first class apple, keeping until March.

Catline. (Coxe, Thompson.) This is a native of Maryland, and we insert Mr. Coxe's description. "It is a great bearer, medium size, stalk short and thick, skin smooth, and of a beautiful yellow, with clear and brilliant red towards the sun, with numerous streaks and many dark spots scattered on the surface; flesh pale yellow, tender, rich, juicy and sweet, as an eating apple in October; November and December it is particularly fine.

Gravenstein. Large, roundish, striped, of first quality, tender, juicy and high flavored, vigorous, erect and productive, perfectly hardy, very vigorous. One of the handsomest and best for all parts of the country. Early Winter apple at the North.

Porter. Large, regular, oblong, tapering to the eye; skin bright yellow, sometimes a dull blush in the sun, flesh tender,

sub-acid, fine, fair and productive; *deserves general cultivation*; September and October.

Yellow Bellefleur. *Very large*, long ovate conical, irregular ribbed, mostly towards the eye; smooth, lemon yellow, generally a blush in the sun, stem long, slender, in a narrow deep cavity, calyx closed in a narrow plaited basin, flesh tender, juicy, of a rich, sprightly aromatic flavor; latter part of November to February; good grower, moderate and constant bearer, one of the best in quality; popular in all of the Southwest and West, and in new lands of the North, and strong soils of New York. It is particularly adapted to all sandy and gravelly soils. Originated in Burlington, N. J.

Baldwin. Large, mostly colored with red, crisp and rich, ranks among the very best; tree upright, vigorous grower, and abundant bearer; keeps in the Valley and West Virginia until February and March. This stands at the head of all New England apples, and is suited to general and extended cultivation. The flesh is yellowish white, crisp, with that agreeable mingling of the saccharine acid which constitutes a rich high flavor.

Rhode Island Greening. Large green; a popular apple and deserves general cultivation. Valuable for cooking, vigorous grower, flesh yellowish, fine, tender, crisp, juicy, slightly acid and aromatic, rapid and stout grower, great bearer. One of the very best for main crops. It succeeds well on light or sandy soils.

Robinson's White Medium, crisp, juicy and delicate flavor, a good bearer, highly esteemed; November to January in the Valley of Va.

Cogswell, Synonyms. Ohio Nonpareil, Cogswell's Pearmain. Above medium size, roundish, regular and uniform, a rich yellow ground, with stripes, splashes and dots of red, stem medium length, rather slender, cavity open, regular, often russeted, calyx, medium or small, basin medium depth; flesh yellowish, crisp, juicy, sprightly, tender, aromatic, sub-acid. A good bearer, always producing fair and even sized fruit. Tree very hardy, suited to general cultivation; November to March.

Rambo. (Coxe, Thomp.) The Rambo is one of the most

popular fruits to be found for market and for general cultivation. It is a highly valuable apple for the table or kitchen and thrives well on most soils, especially on those that are light and sandy, it being a native of the banks of the Delaware. Fruit, medium size, round, greenish yellow, striped with red, tender, juicy and pleasant. Tree vigorous, erect, and very productive; and is one of the best late Fall or early Winter apples for the Piedmont and Valley Districts of Virginia and West Virginia, and is largely cultivated throughout the Western States.

Higby Sweet. Synonyms, Trumbull Sweet, Fenton Sweet. *Fruit*, size medium or above; form roundish, conical, flattened at the ends, often one side enlarged or slightly oblique, color, pale yellow, with a faint tinge of red in the sun, and a few small, obscure, suffused reddish dots; flesh white, very tender, juicy, delicate, rich, sweet: season October to December. Originated in Trumbull county, Ohio.

REMARKS.—This is comparatively a new variety, a very hardy tree, productive, and one of the most delicate of all the sweet apples. In the orchard, it makes a round, regular open head, and if well cultivated and manured when it is needed, it will bear annually and abundantly. It is especially suited to table use—too tender for shipment.

Maiden's Blush. A remarkably beautiful apple, a native of New Jersey, and first described by Coxe. It begins to ripen about the last of August, and continues until the last of October. It has all the beauty of color of the pretty little Lady Apple, and is much cultivated and admired both for the table and for cooking. It is also very highly esteemed for drying. Fruit medium size, flat and quite smooth and fair; skin thin, clear lemon yellow, with a colored cheek, sometimes delicately tinged like a blush, and in others with a brilliant red; flesh white, tender, sprightly, with a pleasant sub-acid flavor. This variety forms a handsome, rapid growing tree, with a fine spreading head, and bears large crops."

WINTER VARIETIES.

Grimes' Golden. (Grimes' Golden Pippin.) An apple of the highest quality, nearly equal to the Albemarle Pippin, medium

to large, yellow, tree hardy, vigorous, very productive; originally from Virginia, grown in Southern Ohio, and throughout the Southwest and West.

Buff Apple. A celebrated North Carolina apple, very fine, large size, much cultivated in Buncombe Co., and other parts of the State.

Cullasaga. A fine apple cultivated in Habersham Co., Ga, and various other parts.

Carthouse or Romanite. (Gilpin, Coxe.) A handsome cider fruit from Virginia, medium, round, striped, sub-acid and agreeable; tree an early and heavy bearer, very valuable on account of its keeping qualities; a very hardy, fruitful, vigorous tree; fruit juicy, rich; late in Spring.

Wine Sap. (Already described) Popular everywhere, and generally cultivated; useful for all purposes; every orchard should have a large proportion.

Roxbury Russet. Medium to large, surface rough, greenish, covered with russet, tree vigorous and great bearer, valuable for its long keeping: December to May. When fully ripe, slightly acid and very pleasant, excellent for cooking. A moderate grower and great bearer; is adapted to moist, strong, rich soil.

White Winter Pearmain. (Already described) Highly esteemed at the West and Southwest.

Pilot. Origin, Nelson Co., Va., very valuable new variety, keeps well and late. (Already described.)

Pryor's Red. A native of Virginia; large, flat, brownish yellow, little russet, tinged with red; flesh fine, rather tender, sweetish, sub-acid, dryish, of a rich agreeable, and peculiar flavor. Elliott says well adapted to rich alluvial soils of the West; very salable in New Orleans; December to February.

Rawles' Genet. Medium, round, greenish, streaked and clouded with dull red. It is a regular and heavy bearer, flesh compact, crisp, juicy and vinous, keeps well, succeeds well in all portions of Virginia, and puts forth its leaves and blossoms much later than other varieties

Hubbardston Nonesuch, is, perhaps, the most beautiful apple that grows, and in this instance, "outward beauty is an

index of inward good," being a very early Winter apple, it is suitable for early market. Fine, large, roundish, oblong, much narrower near the eye, skin smooth, striped with splashes and irregular stripes of pale and bright red, which nearly cover a yellowish ground; flesh yellow, juicy and tender, with an agreeable mingling of sweetness and acidity in its flavor; October to January.

Northern Spy. Large, conical, flattened, striped and quite covered on the sunny side with dark crimson, and delicately covered with bloom; both leaf and blossoms open from one to two weeks later than most other sorts, which renders it a valuable variety for frosty situations. February to April.

Nickajack. An apple of Southern reputation, fruit large, roundish, skin striped and splashed with crimson; flesh yellow, tender, crisp, juicy, with a fine, rich, sub-acid flavor; November to April.

Esopus Spitzenberg. Size medium to large; form roundish, oblong conical, flesh yellow, a little tough until fully ripe, when it becomes breaking, crisp, abounding in a very high flavored aromatic juice; forms an orchard tree of large size, requires a strong soil; December to March.

Fallawater or Tulpehocken. (Already described) This magnificent and delicious apple is largely cultivated in the West and Southwest, and is a favorite in the Valley of Virginia.

King of Tompkin's County. Large, yellowish, shaded with red, splashed with crimson, tender, with a rich, vinous flavor; a popular apple at the North, and does well in the Valley of Virginia, West Virginia and Western States. This superb red apple is of the largest size and finest quality, tree a good grower and bearer, very hardy; November to March.

Ladies Sweet. Large, roundish, green and red, nearly quite red in the sun; sweet, sprightly and perfumed, shoots tender, but erect, a great bearer; originated in Newburg, New York. One of the best Winter sweet apples; November to May.

Lady Apple, Pomme D'Api. A beautiful little dessert fruit; flat, pale yellow, with a brilliant red cheek; flesh crisp, juicy and pleasant. The tree forms a dense erect head, and bears large

crops of fruit in clusters; the fruit sells for the highest price in New York, London and Paris; November to May.

Abram, or *Father Abram*. A Southern variety, medium striped with red, flesh rather firm with an agreeable aromatic flavor; a great bearer and keeps well until April or May.

Ben Davis, or *Kentucky Red Streak*. Large, handsome striped apple of excellent quality, tree very hardy, vigorous and productive; a late keeper, highly esteemed in the West and Southwest.

Swaar. Large, pale lemon yellow, with dark dots, rich and spicy, slender grower and moderate bearer, but excellent quality, worthy of general culture; December to May. Flesh, yellowish, fine grained, tender, high aromatic flavor, excellent.

Limbertain. An old and well known Southern apple; medium size, dull red color, sub-acid, moderately vigorous grower, bears heavily on strong soils; rich, soft, pulpy, aromatic and excellent, late in the Spring; fine keeper; February to late in June.

Milam. (Already described). This is a splendid apple in the Piedmont district of Virginia. Suitable for general cultivation.

Winter Pearmain. (Coxe.) *Green Winter Pearmain*; *Pearmain Herefordshire*. (Thompson.) This delicious old variety, generally known in Virginia as the *Green Winter Pearmain*, is one of the finest of all winter dessert fruits, and its mild and agreeable flavor renders it here, as abroad, a universal favorite, both as a dessert apple and for cooking. Fruit of medium size, oblong and of a pretty regular Pearmain shape; skin stained, and mottled with a soft, brownish red on a dull, russety green ground, dotted with greyish specks; flesh pale yellow, very mellow and tender, with a pleasant aromatic flavor; produces large crops on light, rich soils as well as on the limestone soils of the West.

Yellow Bellefleur. (Already described.) For general cultivation; early Winter.

Winter Sweet Paradise. This is a very productive and excellent orchard fruit, always fair, and of fine appearance,

originated near Columbia, Pennsylvania. Fruit large, regularly formed, roundish, skin fair and smooth, dull green when picked, with a brownish blush, becoming a little paler at maturity. Flesh white, fine grained, juicy, sweet, sprightly and very good; Nov. to April.

Monstrous Pippin, Gloria Mundi. (Coxe, Floy, Thomp.) This magnificently large apple, says Downing, is a native fruit, and we have frequently seen it weighing nearly a pound and a half, and measuring 14 inches in circumference. It is an excellent cooking apple, and, when in perfection, of a fair quality for eating; owing to its great weight it blows from the tree. It would be best to grow it in protected situations. Flesh white, tender, with a pleasant acid flavor; October to January.

Albemarle Pippin. The first commercial apple in America, and generally raised for European markets. (This fruit has already been described).

Peck's Pleasant. Large, roundish, angular; skin smooth, green, becoming yellow, with a blush on the sunny side; resembles the Newtown Pippin; flesh yellowish, fine grained, crisp and juicy, high flavored; a valuable market variety; December to March.

Male Carle. "This is the most celebrated of all apples in Italy and the South of Europe, whence it comes. It is raised in great quantities about Genoa, and its great beauty and delicacy of flavor render it quite an article of commerce in Italian and Spanish seaports." All South of New York it becomes beautiful and fine, but cannot be grown in New England, "Fruit medium size, medicinal, common apple shape, smooth, lemon color, crimson in the sun; flesh white, not juicy, of a delicate rose perfumed flavor." This apple is well adapted to the Southern region of our country, and comes to high perfection in the Valley of Virginia. In season from October to January.

Danver's Winter Sweet. Medium size, greenish yellow, with often a brownish cheek, tender, rich and sweet. Tree moderately vigorous and productive; November to March.

Twenty-Ounce Apple, Cayuga Red Streak. A very large,

showy apple, well known in Cayuga, county, N. Y. It is a very good, sprightly fruit, not very highly flavored, but its remarkably handsome appearance and large size render it one of the most popular fruits in market. The tree is thrifty, bears regular crops and the fruit is always fair and handsome; flesh not very fine, juicy, sprightly, with a pleasant sub-acid flavor.

Chandler, Chandler's Red. Large, roundish, pale yellow ground, mostly red; stalk short, in a wide cavity; calyx small in a wide basin; flesh tender, juicy, rather rich, pleasant sub-acid; moderate grower and great bearer; November to February.

Dutch Mignonne. Large, roundish, dull orange and dull red, large russet specks; flesh rather tender, of a rich, high aromatic flavor; good grower and bears well. Delicious in the middle region, including Virginia and Southwestern States, but little known at the North; November to March.

* *Mason Pippin.* Origin, Brunswick county, Va. A very superior new variety, almost equal to the Albemarle Pippin. (This splendid apple has already been described.) December to April.

* *Stonewall.* Origin, Lunenburg county, Va. Medium to large, greenish yellow, streaked with red, flavor mild and pleasant; rather mealy; a good keeper, and bearer and an excellent new variety; December to April.

* *Red Everlasting.* Origin, Charlotte county, Virginia; medium to small, beautiful crimson color; oblong, very juicy and sweet. Raised by Thomas Baldwin, Esq.; January to June.

* *Hick's White.* Origin, Loudoun county, Va. A beautiful, conical-shaped white apple, with cheek slightly tinged with red; flesh pure white, mellow and rich; one of the best. This is an Autumn apple, extending into winter; December.

* *Atkins'.* Origin, Powhatan county, Va. Medium to large; round; skin fine, red; flesh pale yellow; flavor sub-

NOTE.—Varieties marked thus * are new fruits, which, together with other new kinds, are grown and for sale by the Virginia Nursery and Wine Company, Richmond, Va., and at the Richmond Nurseries.

acid and rich. This fine new apple is raised by Geo. B. Atkins, Esq.; December to May.

Sweet Genet. Origin, Indiana. This new variety is one from a lot of seedlings from *Rawles' Genet*, which has the late-blooming character of its parent in a high degree; being at least a week later in extending its blossoms, it always escapes the spring frost, and the original tree has never failed to produce a crop since it was large enough to bear. Tree healthy, vigorous, spreading, productive, with fruit well distributed, shoots stout, foliage rich, green, abundant; fruit large, fair, covered with red, flavor sweet; season December to March.

NEW VARIETIES.

**Starke Apple*. The Starke apple is a new variety now attracting attention in the West. Mr. A. H. Gaston, of Henry, Marshall county, Illinois, thinks it "the very best apple in America." The Starke is described in the Horticultural Annual for 1869, with a drawing.

**The Sylvester Apple*. At the State Fair held in Rochester in 1868, we saw an apple which was remarkable for its beauty, and when its originator, Dr. E. Ware Sylvester, of Lyons, N. Y., gave us a specimen to taste, we found that its quality kept the promise made by its exterior. Again, this year, we have been able to try other specimens of the variety, and considering it as deserving a wider popularity than it now enjoys, have had it engraved. The tree is said to be vigorous and an abundant bearer. The skin is white and of a most delicate waxy appearance, which is heightened by the beautiful markings of crimson that are found upon the specimens, which have been well exposed to the sun. The flesh is white and very tender and juicy; indeed, upon cutting, the juice follows the knife as it does with a well-ripened pear; flavor, a pleasant sub-acid. Excellent for cooking. Sept. and Oct. Dr. Sylvester should feel gratified at having his name attached to so good a fruit.—*American Agriculturist*, 1870, Jan. No.

**Tyler's Rennet*. This delightful apple was discovered in

an old seedling orchard at Pleasant Valley, Albemarle co., Va.

Description.—Fruit, medium size, roundish, skin very tender, yellowish white, sometimes a blush; surface smooth, flesh white, very tender, crisp, juicy, with a brisk, spicy aromatic flavor; sweetish, slightly acid, very fine; tree rather large, irregular, great bearer; matures early in August; use, eating or dessert and cooking.

OTHER NEW VARIETIES.

**Ohio Nonpareil*, (or Myers' Nonpareil. This is a noble fruit; its early history is involved in some obscurity. In the fourteenth report of the Ohio Pomological Society, 1868, the following account is given: "Our fellow-member, S. B. Marshall of Missillon, Ohio, obtained scions from Wm. Myers, of New Lisbon, about 1840. since which time he has propagated, distributed and planted the trees, and exhibited the fruit upon various occasions, and to him we are indebted for having introduced this fine Autumn or early Winter fruit to our notice. From Mr. Myers he learned that a tree of this variety had fruited for eighteen or twenty years in his orchard; from its excellence he had supposed it to be a grafted fruit, but as the party from whom he had purchased the property had left the country, he had never ascertained whence the trees were procured.

This fine apple has been in bearing for nearly twenty years, and is now coming into fruit in many other places, where it promises to sustain its high reputation.

Tree healthy, vigorous, robust, wide branching; foliage large, healthy; fruit large, fair and handsome, globular, oblate, regular, surface smooth, yellow, covered with mixed and mingled bright red, and stripes and plashes of deeper color, dots minute; flesh yellow, breaking, fine grained, juicy; flavor mild, sub-acid, rich, very agreeable, use, table, kitchen and market, season October to December. Both fruit and tree closely resemble the Cogswell, a Connecticut apple; suitable for general cultivation. This valuable apple has already been described.

Stark Apple. Tree vigorous and healthy, fruit globular,

regular, large, surface smooth, yellow, covered generally, mixed red, splashed, crimson, dots numerous, medium dark; flesh, yellow, breaking juicy, flavor sub-acid, agreeable, quality good, use, market and kitchen; season December and all the Winter. (Description by Dr. Warder.)

The following is a partial list of apples recommended by Prof. Saunders of the "Department of Agriculture," at a meeting of the Potomac Fruit Growers Association" in July 1871, at Washington City.

Nickajack,	Matamuskeet,
Abram,	Hall's Early,
Albemarle Pippin,	Golden Wilding,
Winesap,	Pryor's Red,
Cullasaga,	Cannon Pearmain,
Limbertain,	Smith's Cider,
Milam,	Borum,
Shockley,	Brook's Pippin.

WOODMAN'S LIST FOR STANFORD KENTUCKY.

APPLES.

<i>Summer.</i>	<i>Autumn.</i>	<i>Winter.</i>
Early Harvest,	Red Astrachan,	Ben Davis,
Early Joe,	Fall Queen,	Rawles' Genet.
Carolina Red June.	Yellow Bellefleur.	Rome Beauty.
		Limbertain.

OTHER VARIETIES.

Monte Bello. (Description by Mr. Downing.) This splendid new apple was raised from seed on the place of Mathew Gray, at Riverside. in Monte Bello Township, Hancock Co., Illinois. It is there considered an apple of great promise, the tree being hardy, moderately vigorous and healthy; an early and annual bearer, and the fruit always fair and smooth; fruit above medium, oblate, regular; skin, pale yellow, shaded and mottled with light red, and splashed and striped with dark rich red, nearly over the whole surface, and sprinkled with a few light dots; stalk very short, and small, inserted in a broad cavity, russeted, calyx closed, or

nearly so; flesh very white, fine grained, a little stained next to the skin, very tender, juicy, mild, sub-acid, vinous flavor, quality very good or best, core medium or small; ripens from September to December.

**Mote Sweet*. Produced from the seeds of the *Stillwater Sweet*. Origin, Ohio. "Tree vigorous, with a round, spreading top, thus differing from its parent; foliage large, wide, finely serrate, and rather pale green; fruit large and fair; globular, oblate, surface very smooth, greenish yellow, becoming whitish yellow, rarely a light blush; dots scattered, gray, often becoming rosy spots; flesh light yellow, very fine grained, melting, juicy, flavor very sweet, pleasant; season September; use table and kitchen; quality best. This is one of the most delicate, tender, sweet apples ever exhibited; is a new variety; very highly recommended.

**Celestia*. "From another seed of the *Stillwater Sweet*. This is considered one of the most remarkable apples of the country. Resembling the famous *Dyer* in its general appearance, texture, and peculiar flavor, it excels that sort in the perfection of all these good qualities, and is especially preferable in its much more attractive appearance, and more perfect fruit. The original tree is thrifty, with an upright, spreading head; shoots, light redish brown; foliage, medium, very finely serrated, sharply acuminate." Fruit large to very large; fair, conical, globular, somewhat angular; surface smooth, pale yellow; dots scattered gray, with green bases; tender, juicy, sub-acid; season, September.

**Powers*. This beautiful, showy and delicate table apple was found in a village garden in the town of Perrysburg, Ohio, and introduced to the Ohio Pomological Society by Mr. George Powers. Fruit large to very large, fair and handsome, globular-oblate, regular; surface smooth, red, with distinct splashes of carmine on a delicate, waxy, yellow ground; flavor very mild sub-acid, pleasantly aromatic or spicy, agreeable; season, October, November; use table; quality, excellent."

SUMMER VARIETIES.

In addition to and among others named in this work, the

following varieties are recommended by experienced fruit growers, in the States of North and South Carolina, Georgia, Alabama, Mississippi, &c., most of Northern apples failing in *keeping qualities*. *

Berry. Large, green, with red stripes; Winter.

Blackshear. Very large, white; Winter.

Buckingham. Large, crimson; Autumn.

Carter. Large, yellow; Winter.

Chestattee. Large, yellow; Winter.

Cullasaga. Large, red; Winter.

Dahlonaga. Large; Autumn.

Disharoon. Large, yellow; Autumn.

Ducket. Winter.

Equinitely. Large, red, fine quality; late Fall and Winter.

Hominy. Medium size, red; Summer; identical with *Sops of Wine*.

Julian. Medium size, yellow; summer.

Maverick Sweet. Large, red, sweet; Winter.

Mangum. Medium size; Autumn.

McCloud's Family. Summer.

Nickajack. Very large, dull red; Winter.

Red Wamir. Very large, red; Winter; very long keeper.

Red Fall Pippin. Large, dark red; Autumn.

† *Shockley*. Medium size, yellow and red; a long keeper

* Nearly all Winter apples commence to be in eating condition in the latitude of Athens, Georgia, in October, and if carefully put away, in a cool, airy room, free from severe frost, much the larger can be kept through the Winter, and some varieties keep well through the Spring. Apples may be preserved at a temperature just above freezing for many months without the least decay. At a temperature of 80° the best of Winter apples in tight barrels, will spoil in a few days.

† This splendid new apple, ("so highly colored they look like pictures") originated with Mr. Shockley, of Jackson county, North Carolina. Its popularity is unbounded in that region. The editor of the *Carolina Farmer and Weekly Star* says: "We have no personal acquaintance with the Shockley apple, but the specimens we have are yet in perfect preservation this, 6th day of August, and are only a little shrivelled, but of a color so intense that they look to be almost too artificial. Mr. W. H. Thurmond, whose reputation as a horticulturist makes him first rate authority, tells us that he has known two Shockleys which were preserved two years."

Any number of Shockleys can be had at the "*Gate City Nursery*," whose advertisement is standing in the *Plantation*, a valuable journal published at Atlanta, Georgia.

and great bearer; one of the most valuable of Southern Winter apples.

Wall. Large, fine; Winter.

Yopp's Favorite. Large, fine quality; Autumn.

North Carolina Red June. Not the Virginia long stem, nor the striped June of some localities; conical, crimson, *short stem*, stands first among Southern early apples; market fruit.

Early Harvest. Perhaps the next best; fine for market.

Red Astrachan. Highly recommended; all uses.

Early Sweet Bough, Red Margaret, Early Joe, Buckingham, Large Summer Queen, Summer Rose, May Apple; all fine.*

MISSOURI APPLES.

List of Apples adopted at the Ninth Annual Meeting of the Missouri State Horticultural Society, January 1868, and Recommended by the Society.

Summer, for market. Early Harvest, Red June, Red Astrachan, Sops of Wine.

For Family. Same, adding Benoni, Sweet June, American Summer, Pearmain, Early Strawberry, Summer Queen.

Fall, for market. Maiden's Blush, Rambo, Hubbardston, Nonesuch, Famuese, Ramsdell Sweet.

Early Winter. Wine, or Pennsylvania Red Streak, Smith's Cider, Porter, Fall Queen, Prior's Red, Rome Beauty, Moore's Sweet.

For family. Yellow Bellefleur, Peck's Pleasant, Rhode Island Greening, American Golden Russet, Jonathan, Newtown Pippin, Spitzenburg, Wagener, Fallawater.

Late Winter, for market. Rawles' Genet, Newtown Pippin, (on limestone soils,) Willow Twig, Wine Sap, Gilpin Ben Davis, Ladies' Sweet, White Winter Pearmain.

For Cider. Wine Sap, Gilpin, Rawles' Genet.

ADVICE.—We deem it not inappropriate, at this place, again to warn farmers and those who intend going into fruit-

* The last ten varieties are highly recommended for Middle North Carolina, by Col. J. B. Zollicoffer, who is an experienced orchardist.

culture, to look well to the selection of varieties. "On any account do not cumber your land and waste your labor, and deprive yourself of good fruit, as many have done, in planting a great number of miscellaneous varieties, with high-sounding names that will neither give profit nor pleasure; but confine your planting to a few *well known kinds*, that have established a reputation for their excellence in *your vicinity or section of country*." You need not discard all Northern or foreign kinds, as many of them do well in different sections of the South and West, and may do well with you: yet it is much safer, in our judgment, to plant, as before said, kinds that are known to succeed well in your section, and if for market, the *earliest* should always be selected in the more Southern districts, and for all places, a few of the *very best* is better for profit, however large the orchard, than a confused number of those that are uncertain or medium, as it regards the requisites desirable in good, profitable fruit. In these opinions Col. Zollicoffer, of North Carolina, concurs with me.

APPLE REPORT.

Abstract of a Report of the Comparative Flavor, Thrifty Growth, Regular Bearing, Early Bearing, Hardiness, and Productiveness of Orchard in Hannibal County, and another in Cameron County, Missouri. The first by O. H. Lear, and the second by John C. McCarthy. Portions of each selected and arranged as follows :

TABLE—SCALE OF TEN.

No. 10. the best, No. 7, medium, No. 1, poorest.	Flavor.	Hardness.	Thrifty Growth.	Early Bearing.	Regular Bearing.	Productiveness.
SUMMER APPLES.						
American Summer Pearmain.....	10	9	4	9	4	8
Benoni.....	8	10	8	5	...	8
Prince's Yellow Harvest.....	7	9	7	5	5	5
Sweet June.....	10	10	10	10	10	10
Red June.....	6	9	7	8	10	10
Summer Queen.....	8	10	10	4	4	5
AUTUMN APPLES.						
Fall Wine.....	10	9	8	10	...	9
Fall Queen, or Turner's Queen.....	9	8	8	10	5	9
Porter.....	10	8	8	5	8	8
Rambo.....	10	4	10	9	...	9
Gravenstein.....	9	10	8	6	...	9
King of Tompkins County.....	8	10	9	6	...	4
Maiden's Blush.....	10	10	10	8	7	8
WINTER APPLES.						
Ortley, or White Bellefleur, always in demand.....	9	10	9	7	8	10
Rawles' Genet, standard.....	7	10	6	7	7	10
Wine Sap, standard.....	9	10	8	8	10	10
White Winter Pearmain, very saleable.....	10	10	8	5	6	10
Yellow Bellefleur, fine, when you get it..	10	10	8	7	8	2
Smith's Cider.....	7	10	10	7	8	
Fallawater.....	6	6	10	10	...	10
Ben Davis.....	6	10	8	10	...	10
Northern Spy.....	10	10	10	3	5	3
Pryor's Red.....	10	9	6	2	4	
Baldwin.....	9	5	8	5	5	
Dominie.....	8	10	10	10	...	10

VARIETIES CULTIVATED AS DWARFS IN THE
MIDDLE REGIONS OF THE SOUTH.

Buncombe,	Carter's Blue,	Disharoon,
Early Harvest.	Early Red Margaret,	Equinetelee,
Family,	Kettageska,	Mangum,
Nickajack,	Red Astrachan,	Red June,
Sweet Bough,	Shockley,	Taunton,
Yopps Favorite,	Transcendant,	Siberian Crabs.

TABLE OF DISTANCES AT WHICH TREES SHOULD
BE PLANTED.

Standard Apple Trees	- - -	25 to 33 feet apart each way.
Dwarf " "	- - -	8 to 10 " "
Standard Pear Trees	- - -	20 " "
Dwarf " "	- - -	6 to 10 " "
Standard Cherry	- - - -	20 " "
Dwarf Cherry	- - - -	10 " "
Peach, Plum and Apricot Trees,	12 to 20	" "
Currants, Gooseberries, and Raspberries,	3 to 6 feet apart	each way.
Grape Vines	- - - - -	5 to 8 feet apart each way.

NUMBER OF TREES TO AN ACRE AT VARIOUS
DISTANCES.

At 3 feet apart each way	. . . . .	4,840
" 4 " "	. . . . .	2,729
" 5 " "	. . . . .	1,742
" 6 " "	. . . . .	1,200
" 8 " "	. . . . .	680
" 10 " "	. . . . .	430
" 12 " "	. . . . .	325
" 15 " "	. . . . .	200
" 18 " "	. . . . .	135
" 20 " "	. . . . .	110
" 25 " "	. . . . .	70
" 30 " "	. . . . .	50
" 33 " "	. . . . .	40

The number of plants required for an acre, at any given distance apart, may be ascertained by dividing the number of

square feet in an acre, (43,560) by the number of square feet given to each plant, which is obtained by multiplying the distance between *rows* by the distance between the *plants* or *trees*. Thus strawberries planted three feet by one foot, give each plant three square feet or 14,520 plants to the acre.

QUALITIES OF APPLES.

Qualities desirable in varieties of Apples for different purposes.

For a good and salable apple for market, we would recommend a combination of the following requisites:

A thrifty grower, good bearer, fruit large, handsome and of excellent quality: a red apple is the most salable. Some, though not first rate, are profitable for the market as they sell from their superior size and beauty, although the quality may be only tolerable.

For the private garden or small orchard, quality is of the first importance; yet appearance, growth and bearing are also important considerations.

With the amateur, quality is the main thing, and appearance next; while growth and bearing are of less regard.

A dessert apple should be of good size, handsome, and of a fine rich flavor.

Cooking apples should be rather large, fair, and of an even surface, qualities various for different purposes. The cooking of apples destroys much of their acidity. Some brisk acid apples, that are poor for the dessert, are excellent for the kitchen. Some apples will not cook well, but retain their form and remain hard after this process. These should be discarded. Some cook quickly and form a jelly, which is desirable for some purposes, but not for others.

The best sweet apples for milk, are those that bake perfectly soft, yet retain their form. Those that fall to pieces from their own weight in cooking and mix up with the milk are not good.

GATHERING, PRESERVING AND MANAGEMENT OF
APPLES.

The art of keeping or preserving fruit, is simply the prevention of the chemical processes which produce their dissolution; as life, whether animal or vegetable, prevents putrefaction. Many fruits exist long after they are gathered from the tree, before they become matured and ripe, and die spontaneously, and, in consequence putrefy, as crabs, sloes, pears, apples, &c. The art of preserving them consists in storing them, where the heat is neither much above or below 48 degrees, which is the temperature of the interior parts of the earth; that is in a dry cellar, or beneath the soil; or well-covered with straw leaves, or mats in a room. As greater heat might make them ripen sooner than they are wanted, by the increased activity of their vegetable life; and frost by destroying that life, would subject them to putrefy, when they become thawed; as often happens to apples and potatoes, which are not well defended from frost—and lastly the *moisture* would injure them in many respects; first, by its contributing to destroy their vegetable life; secondly, in promoting the chemical process of putrefaction; and thirdly, by its encouraging the growth of mucor or mould, which will grow in most situations without much light or air.

Great cold, on the contrary, destroys both animals and vegetables by the torpor occasioned by the defect of stimulus, and a consequent temporary death. Afterwards, if a great degree of cold be continued, in some cases, the expansion of their freezing juices may burst the vegetable vessels, and thus render the life of them irrecoverable. It is affirmed by Mons. Reaumeur, that if frozen apples be dipped in cold water repeatedly, and the ice thus formed on their surface wiped off, or if they be left in a large pailfull of very cold water, so that they may not thaw too hastily, they will not loose their flavor. If this be true, and the apples will keep sound some time afterwards, it would seem that vegetable life was not destroyed; but that, like sleeping insects, they are re-animated by the warmth; otherwise, if the flavor be not de-

stroyed and they could be immediately eaten, or used in cookery, it is still a valuable discovery. It is at least a simple plan and easily tested. A correspondent from Indiana says: "The apple or potato that has been frozen, decays in consequence of sudden thawing, but if they are put, in a frozen state, into cold water until the frost is expelled, and then are used, they will be nearly if not quite as good as if they had not been frozen.

The same writer remarks, "that to keep apples from Autumn to June, they should be placed in a shallow hole, dug as if for potatoes; the bottom is first covered with corn stalks or straw, (leaves would be best) and then straw with dirt, five or six inches more. No shelter is to be placed over them. When the severe weather commences, and the ground, and perhaps the apples, are thoroughly frozen, place straw over the frozen heap, and cover the whole again with a coating of earth 10 or 12 inches thick. The object of this is to keep the first coating of earth frozen, until Spring, and then to cause it to thaw *very slowly*." Any vegetables may be preserved in this way, but we think it would sometimes be found that apples treated in this manner would acquire a somewhat unpleasant earthy flavor; and, besides, they would immediately decay on exposure to the air.

APPLE CELLAR OR FRUITERY.

Where apples are to be preserved for domestic purposes, or for the later markets, throughout the Winter, and in quantities, a cellar expressly for this purpose should be dug; unless the farmer has a very dry one already prepared. This cellar should be made on a hill if possible, or rising ground sloping to the North, with openings or windows facing the North, to admit the air in fine weather, and that should be attended to. It should be dug in dry, gravelly or sandy soil. It should be walled with stone, brick, or wood, and of any convenient depth to secure dryness, for that is the most important consideration, save that of freezing. The height of the body of the house may be 4 or 5 feet above ground and covered and planked up similar to an ice house. The barrels should be placed on tiers, *on their sides*, and the cellar kept as dark as possible.

In such a cellar apple growers may safely and securely keep any quantity of apples, in the best order, provided they are put away at the proper time, and in good condition. The expense of constructing such a house would be but trifling, even less than that of an ice house; unless it is built very large, and at a place where materials are scarce.

All apples to be kept through the Winter, should be gathered by hand, aided by the "fruit picker," mentioned in another part of this work. The ground immediately under the trees should be covered with straw, or any soft litter, whilst gathering, as the best fruit is apt to fall. The same should be done when the apples are intended for cider, as bruised apples will not keep or make good cider. The gathering of the Winter fruit should be delayed as long as possible to secure fine flavor, but it will keep longer and better, if gathered before quite ripe; but there is a difference in this respect in different varieties of apples. In the climate of Virginia, from the middle of October to the middle or even last of November, on mountain sides, and high mountain valleys is the proper time. After that time there is danger from frost or freezing. Those who have a good, cool dry cellar had much better put away their apples as gathered, if late in the season. As a general thing in the absence of a thermometer, when the ice is made half an inch thick, the barrels should be removed *very carefully*, from the shed to the cellar or fruitery. It is generally admitted "that the nearer the fruit is kept to the freezing point the better. It will not generally freeze unless the temperature is 5 to 7 degrees below 32, or the freezing of water." Apples headed up will bear frost 10 or 12 degrees below the freezing point.

We would say farther in regard to gathering or picking apples to keep, that, as a general rule, in order to secure soundness and a good condition; Winter fruit should be picked in *dry, cool weather*, the gathering delayed as long as possible, avoiding severe frost. It should be handled with care in order to prevent bruising, and should not be allowed to lie in heaps exposed to the sun, or even stand in barrels exposed to the sun, as such course is injurious to the life and keeping qualities of the apples.

Apples for distant or foreign markets should be placed in new, tight flour barrels as soon as gathered from the tree—the finer sorts may be wrapt in tissue paper. The barrels should be gently shaken while filling, and the head gently and closely pressed in; lined and nailed with 3-penny nails. (For further directions as to packing, see Mr. D. H. London's valuable communication. These barrels are then placed in a cool shady exposure, under a shed open to the air, or on the north side of a building, protected by a covering of boards. It is usual for them to remain here for a week or two, or until there is danger of freezing, when they are *carefully* removed to the cellar or fruitery.

NOTE.—In some large, airy, packing houses, at the foot of the *Blue Ridge* in Virginia, the barrels are placed on tiers *on their sides*, as they are filled from the heaps or orchards. The temperature during cold spells is regulated by the thermometer, stoves being used so as to secure a temperature not exceeding 32 degrees. In this way, the fruit is always ready for shipping, and is taken from the houses in cold weather to Rail Roads for immediate transportation.

INSTRUCTIONS FOR GATHERING, BARRELING, SHIPPING, &c.

The following very important, valuable and practicable directions for gathering, barreling, and shipping apples, are from a New York Commission Merchant, (No. 63, Broadway) formerly a resident of Richmond, Va. A part of the business of his house is to ship large quantities of fruit to England and European countries.

NO. 63 BROADWAY, NEW YORK, Sept. 1, 1870.

As the season is near in which your fruit growers must gather and prepare their pippins and ladies' apples for market, and deeming the matter of so much importance, I beg leave to bring to their attention the following instructions which I have gained by several seasons of experience in the sale and handling of Albemarle Pippins and Ladies' apples.

First—Gather the pippins before they are fully ripe, by picking the fruit and carefully handling it and leaving it in an open house till it sweats and dries off. On Southern ex-

posures the pippin is usually ripe enough 1st October, on the Northern exposures by the middle of October; but the soil varies their ripening, and the grower must judge of the condition of the apples by their appearance.

Second—A new barrel only ought to be used, and after *taking out the bottom, not the head*—tack the lower middle hoop on each side of the bulge of the barrel with three-penny nails, (no larger size nails) clinch inside so that the inside of the barrel is perfectly smooth; put the head of the barrel to the floor. Carefully select the perfect apples, wipe each one and place them with the stems down, seeing that the apples are uniform in size and appearance; when by placing with the hand the apples layer after layer till the barrel is a little more than full, gently press in the bottom head and headline, *across* the heading, using the three-penny nails, and then tack the top hoop with not over 5 to 6 three-penny nails, turn up the head and do the same. Mark the *owner's initials and number of barrel, say No. 1 and up*, so that when the fruit reaches me it can be known. I have had much trouble from this omission.

Third—Ship to the care of the Old Dominion S. S. Co., Richmond, with instructions to the Chesapeake and Ohio Railroad Company, or whatever line may carry the fruit to Richmond, to forward to me the bill of lading. Ship in round lots of 100 barrels or more, as large uniform lots sell at better prices than small and irregular lots.

Fourth—*Do not ship to this market any defective fruit, nor any mixed fruit, and upon no account put large, fine fruit on the head and poor small fruit in the middle of the barrels; one such barrel will defeat the sale of a thousand barrels. In plain words, be certain that you pack your fruit HONESTLY.*

Fifth—handle the ladies' apples quite as carefully as you do the pippins, observing this fact that it is the *small sized Red Ladies'* apples, which bring the highest prices; with the pippin it is the large clear-skinned fruit, which command the best price.

Sixth—Wine-saps, if *very* carefully handled and the fruit be of the same size, will generally sell at from \$4 to \$6 in

small quantities, whilst the pippins have brought from \$6 to \$9, and some as high as \$16. Ladies' apples from \$10 to \$30.

My wish has been to get the shipment of most of the Albemarle pippins and Ladies' apples which are sent here, for I well know the advantage to the owners which will result by having one known house to control this fruit—it is known to me that the quality and flavor is highly valued throughout Great Britain, the chief drawback being the *order* in which it is shipped, and this has been seriously injured by indifferent and unprincipled parties getting hold of small quantities of Virginia pippins and sending them to Liverpool in bad order. Sincerely and honestly wishing to see this large and growing interest faithfully guarded here, I have written this letter for your Virginia fruit growers, and feel quite certain that if the instructions are carefully followed, the shippers to this market will not regret it; the Ladies' apple is now grown in your section better than it is in any other section, and I know of no fruit equal to a really No. 1 Albemarle pippin.

With consideration and esteem,

I am, very respectfully,

DAN'L H. LONDON.

NOTE.—Although the above advice is intended for a particular section of the country, yet its value, in most respects, will be appreciated in all apple regions.

HOW TO CUT AND PRESERVE SCIONS.

As every farmer should be able to graft and bud his trees, it is of importance to select, judiciously, the scions for this purpose, and to know how to preserve them when selected. It is best to select and cut the well ripened and thrifty shoots—those that grow about the middle of the tree from upright vigorous limbs. The growth of some valuable trees is so limited that the growth of one year is too short, and in that case a little of the wood of the preceding year's growth is taken with the graft.

Scions may be cut at any time from the falling of the leaves to the swelling of the buds. We think it best, however, to cut them before very cold weather sets in, as they

may be injured during very cold winters. Some nurserymen prefer to cut only a few weeks before setting and just before the swelling of the buds, as they say the scion will in that case more readily absorb moisture from the stock, which promotes the union. Scions may be cut in October and November, and kept in a perfect state for one year. When scions are cut in the fall or winter, the best mode of saving them is to bury them from four to six inches deep in a light soil, where the water will not stand on them. Sandy yellow soil is best, or sand alone. The situation should be covered or shaded, and they should be kept moist, but not wet. Sawdust will keep them very well, and as it is easily obtained will be found very convenient. Where there are many scions and they will not be needed through the winter, they may be placed in a box, which is to be only half or two-thirds full; cross pieces are fastened upon the inside in such a manner as to prevent the scions from falling out when inverted. The box is then buried, upside down, in a place where water will not come in contact with the scions. In putting away grafts we cannot be too careful to prevent their losing their identity. Tie securely in bundles, and with each tie up a stick marked in such a manner as not to be obliterated. Some take the precaution to cut away a portion of one or two of the larger scions, in order to obtain flat surface on which numerals are cut with a knife. A permanent record is of course kept of the varieties indicated by these numbers.

When bog-moss can be found, it is an excellent material with which to pack the scions in a box.

When scions are cut in the Winter or Spring, or even in the Fall, they may be packed in a tight box or chest, first putting in some damp moss or saw dust. It does not matter how many are packed together, the more scions the better they keep. Mould will not injure them. As the weather becomes warm, moisten the saw dust or moss and the inside of the box occasionally. Keep the top on tightly, and place them in a damp, cool cellar. Too much moisture would be injurious, as it induces premature starting of the buds or kills the scions by saturation. Saw dust, a little moist, is consid-

ered about one of the best materials for the preservation of scions; they should be closely imbedded in it, and, when taken out, they will be found plump and in fine order. Scions that are intended for immediate use may be cut at the time of setting, but care should be taken that they do not shrivel—they should not be exposed to the sun or air, or the warmth of the hands; put them in as soon as possible after cutting.

If scions should become frozen, let them thaw closely covered, and in a dark cellar.

RABBITS, MEADOW MICE, AND OTHER BARK EATERS.

The mischief done by these depredators is generally irreparable. A friend of ours, last Winter, lost the larger portion of a fine orchard of the famous Pilot and Albemarle Pippin apples, set the previous Spring. They were literally skinned by the rabbits from the ground to the height of twelve or fifteen inches.

To prevent such girdling and barking of young trees there are various simple remedies:

1st. In Europe *soot and milk* applied as a paint to the stems as far up as the animals can reach. It should be done at the approach of Winter, on a dry day.

2. *Coal tar*, made at gas works, is an infallible remedy. It may be had at a few cents per gallon. As Winter sets in, apply a coat of this with a brush (painter's brush is best), laid on the lower part of the trunk from the ground to the height of one and a half or two feet. This will do no injury to the bark, while it completely, for that season, prevents the attacks of rabbits, mice, and all bark devourers. In England the gardeners use this composition as a protection of any small shrubs and trees liable to be girdled. If the rains do not take off this and similar coats by the Spring, *soap-suds*, applied with a coarse rag, will effect the purpose, and otherwise benefit the trees.

3. Trees may be saved by tying around them laths, shingles, old barrel staves, narrow boards, strips of paste-board, stiff paper, old cloth, &c.

4. Offensive substances, such as tobacco stems or rubbish, sulphur, assafœtida, hen or pigeon dung, mixed with mud or clay, and applied.

5. Beef or hog liver, when fresh, rubbed on the stems as high as the rabbits can reach. Fat beef or tallow may be used. The liver is best.

6. Dr. McCannel, of Ohio (*in the American Agriculturist*), finds that a mixture of *assafœtida* and *soft soap* painted on the bark of young trees will effectually preserve them from the attacks of rabbits and meadow mice. He does not give the proportions, or the form in which the assafœtida is used.

LABELS FOR FRUIT TREES.

No orchardist should trust to his memory, but should promptly label his trees, *distinctly and durably*. It is perplexing and vexatious to lose *marks*, and, to nurserymen, would occasion serious losses, and place them in awkward predicaments with their patrons and customers.

1. Zinc is a good material when written on with a composition of two parts fine verdigris, two sal-ammoniac, one lamp-black, twenty water. Mix in a mortar, with a little water at first—shake and bottle for use. It will appear very legibly, and is quite durable; or with types—small pica or long primer will answer—with a lever, stamp the name or number on the zinc.

2. Wood painted with white lead; use soft, smooth, thin pieces. If not painted, moisten the wood, and write with a good strong pencil, with a heavy hand.

3. Old oxydized or rusted zinc will receive and retain the mark of a common lead pencil.

4. On old tin or new, or sheet lead, write with a sharp awl or steel instrument, *cutting through the coat of tin*; use sheet lead the same way, or stamp the name or number with type and lever.

5. Wood *printed* is the best for nurserymen. Let the pieces be smoothly prepared and thinly painted with white lead. Use a lever for a press; it is more distinct and expeditious than

writing. Four or five of the letters of each name are enough, and numbers are quickly printed.

6. Labels made of strips of old tea chest lead, old tin, zinc, or sheet lead, cut wide at one end for marking, the other drawn to a point and bent round a limb. The point may be run through a hole in the label and clinched.

7. For the use of the farmer, old tin, &c., may be used, and the letters or figures made with a sharp pointed awl or punch, by shaping them with little dots or holes. This is very simple and durable. *Fastenings*—Stout twine will last a year. Nos. 20 to 23 *annealed* copper wire is far the most durable and best fastening; but see it does not cut the limb.

“A tree label that will not require too much trouble to make it, and that will remain legible for a series of years, has long been a desideratum among fruit-growers. It may be that this is supplied by the simple zinc label written with a common black-lead pencil. Several gentlemen inform us that they have had labels of this kind remain legible for ten or more years, and that though the writing makes but little show when recently done, in time it becomes more distinct. We suppose that the surface of the zinc just under the writing is protected by the black-lead or plumbago of the pencil, and that while the rest of the surface is oxidized by the action of the weather this remains intact; or it may be that the carbon—the best black-lead is nearly pure carbon—unites in some way with the zinc. The only objection we see to these labels is the ease with which they may be effaced when the writing is fresh, but a few weeks' exposure fixes it. The zinc is cut in the form of an elongated triangle, the point of which, when wrapped around a twig, will hold the label, and at the same time expand as the tree increases in size. Mr. O. D. Case sends us a specimen of the labels he has found to be most serviceable. He uses a tag of zinc, upon which he marks a number, and then with an awl punches holes through the zinc, following the outline of the number, as in the figure; the roughness raised by the punching is filed off. A number of this kind has the advantage that it can be buried in the ground with cuttings and scions without risk of being obliterated, but

it of course requires that a record of the numbers and the names they represent should be carefully kept.”—*American Agriculturist*.

INSECTS INJURIOUS TO THE APPLE TREE AND ITS FRUIT.

The apple trees of Virginia, and the South generally, as far as the author's knowledge extends, are not infested with insects to any serious extent; but the same cannot be said of the fruit, although, comparatively speaking, our losses in this regard are but small when compared with those of the North. There, and to some extent throughout the West, they have vast armies of insect enemies to contend with, which at the present day make successful fruit growing, in those parts, a more difficult and scientific pursuit than here.

If the farmers in this country knew more of entomology, or were better acquainted with the nature and habits of insects (*bugs as some term them*) that are injurious to vegetation, it would be the means of saving many thousands of dollars to productive industry, and much to themselves individually; for most persons can form no idea of the extent of damage done to orchards by these little depredators.

We think we cannot give a better or more recent account of these destructive insects than can be found in the “Report” of the Missouri State Entomologist for the year 1868–69, as they are in perfect accordance with our own views on this subject and should be widely disseminated throughout all the fruit growing regions of our country:



APPLE BORERS.—“The apple-tree borer was entirely unknown until Thomas Say described it in the year 1824; and, according to Dr. Fitch, it was not till the year following that its destructive character became known in the vicinity of Albany, N. Y., for the first time. Yet it is a native American insect, and has for ages inhabited our indigenous crabs, from which trees my friend, Mr. A. Boller, took numerous specimens in the vicinity of Chicago, ten years ago. It also attacks the Quince, Mountain Ash, Hawthorn, Pear, and Juneberry. Few persons are aware to what an alarming extent this insect is infesting the orchards in St. Louis, Jefferson, and adjacent counties, and for aught I know, throughout the State. A tree becomes unhealthy, and eventually dwindles and dies, without the owner having the least suspicion of the true cause—the gnawing worm within. Even in the orchard of the most worthy President of our State Horticultural Society, I found one or more large worms at the base of almost every tree that I examined, notwithstanding he had been of the opinion that there was not a borer of this kind on his place.

“At the above figure this borer is represented in its three stages of larva (a), pupa (b), and perfect beetle (c). The beetle may be known by the popular name of the Two-striped Saperda, while its larva is best known by the name of the Round-headed apple tree borer, in contra-distinction to the Flat-headed species, which will be presently treated of.

“The average length of the larva, when full grown, is about one inch, and the width of the first segment is not quite one fourth of an inch. Its color is light yellow, with a tawny yellow spot of a more horny consistency on the first segment, which, under a lens, is found to be formed of a mass of light brown spots. The head is chestnut brown, polished and horny, and the jaws are deep black. The pupa is of rather lighter color than the larva, and has transverse rows of minute teeth on the back, and a few at the extremity of the body; and the perfect beetle has two longitudinal white stripes between three of a light cinnamon brown color. The Two-striped Saperda makes its appearance in the beetle state during the months of May and June, and is seldom seen by any but the entomologist—

who makes a point of hunting for it—from the fact that it remains quietly hidden by day and flies and moves only by night. The female deposits her eggs during the month of June, and mostly at the foot of the tree, and the young worms hatch and commence boring into the bark within a fortnight afterwards. These young worms differ in no essential from the full grown specimens, except in their very minute size; and they invariably live for the first year of their lives on the sap-wood and inner bark, excavating shallow, flat cavities which are found stuffed full of their sawdust-like castings. The hole by which the newly hatched worm penetrated is so very minute that it frequently fills up, though not till a few grains of castings have fallen from it; but the presence of the worms may be generally detected, especially in young trees, from the bark under which they lie becoming darkened, and sufficiently dry and dead to contract and form cracks. Through these cracks some of the castings of the worm generally protrude and fall to the ground in a little heap, and this occurs more especially in the Spring of the year, with the rising sap and frequent rains, such castings becoming swollen and augmented in bulk. Some authors have supposed that the worm makes these holes to push out its own excrement, and that it is forced to do this to make room for itself; but, though it may sometimes gnaw a hole for this purpose, such an instance has never come to my knowledge, and that it is necessary to the life of the worm is simply a delusion, for there are hundreds of boring insects which never have recourse to such a procedure, and this one is frequently found below the ground, where it can not possibly thus get rid of its castings. It is currently supposed that this borer penetrates into the heart of the wood of the tree after the first year of its existence, whereas the Flat-headed species is supposed to remain for the most part under the bark; but I find that on these points no rules can be given, for the Flat-headed species also frequently penetrates into the solid heart wood, while the species under consideration is frequently found in a full grown state just under the inner bark, or in the sap-wood. The usual course of its life, however, runs as follows:

“As Winter approaches, the young borer descends as near the ground as its burrow will allow, and doubtless remains inactive till the following Spring. On approach of the second Winter it is about one half grown, and still living on the sapwood; and it is at this time that these borers do the most damage, for where there are four or five in a single tree they almost completely girdle it. In the course of the next Summer, when it has become about three-fourths grown, it generally commences to cut a cylindrical passage upward into the solid wood, and before having finished its larval growth, it invariably extends this passage right to the bark, sometimes cutting entirely through a tree to the opposite side from which it commenced; sometimes turning back at different angles. It then stuffs the upper end of the passage with sawdust-like powder, and the lower part with curly fibres of wood, after which it rests from its labors. It thus finishes its gnawing work during the commencement of the third Winter, but remains motionless in the larval state till the following Spring, when it casts off its skin once more and becomes a pupa. After resting three weeks in the pupa state it becomes a beetle, with all its members and parts at first soft and weak. These gradually harden, and in a fortnight more it cuts its way through its sawdust-like castings, and issues from the tree through a perfectly smooth, round hole. Thus it is in the tree a few days less than three years, and not nearly two years as Dr. Fitch suggests. I have come to this conclusion from having frequently found, during the past Summer, worms of three distinct sizes in the same orchard, and Mr. D. B. Weir, of Lacon, Illinois, had previously published the fact,* while a correspondent to the *Country Gentleman*, of Albany, N. Y.,† who says he has large experience with this borer, sent to the editors specimens of all three sizes, which he calls ‘this year’s, two and three old worms.’ The individual from which I drew my figures, and which was taken from a crab apple tree, went into the pupa state on the 14th day

* *Prairie Farmer*, Chicago, April 20, 1867.

† *Country Gentleman*, September 12th, 1867.

of March, and became a beetle on the 15th of April; but was doubtless forced into rapid development by being kept throughout the Winter in a warm room.

“REMEDIES.—From this brief sketch of our Round-headed borer, it becomes apparent that plugging the hole to keep him in, is in a par with locking the stable door to keep the horse in after he is stolen; even supposing there were any philosophy in the plugging system, which there is not. The round, smooth holes are an infallible indication that the borer has left, while the plugging up of any other holes or cracks where the castings are seen, will not affect the intruder. This insect probably had some natural enemies belonging to its own great class, and some of our wood-peckers seek it out from its retreat and devour it; but its enemies are certainly not sufficiently under our control, and to grow healthy apple trees, we have to fight it artificially. Here, again, prevention will be found better than cure, and a stitch in time will not only save nine, but fully ninety-nine.

“Experiments have amply proved that alkaline washes are repulsive to this insect, and that the female beetle will not lay her eggs on trees protected by such washes. Keep the *base* of every tree in the orchard free from weeds and trash, and apply soap to them during the month of May, and they will not likely be troubled with borers.” (This is repulsive to almost all insects, and greatly benefits the tree in other respects.) “For this purpose soft soap or common bar soap can be used. The last is, perhaps, the most convenient, and the newer and softer it is the better. This borer confines himself almost entirely to the butt of the tree, though very rarely it may be found in the crotch. It is therefore only necessary, in soaping, to rub over the lower part of the trunk and the crotch; but it is a very good plan to lay a chunk of the soap in the principal crotch, so that it may be washed down by the rains. In case these precautions have been unheeded, and the borer is already at work, many of them may be killed by cutting through the bark at the upper end of their burrows, and gradually pouring hot water into the cuts so that it will soak through the castings and penetrate to the insect. But

even where the soap preventive is used in the month of May it is always advisable to examine the trees in the Fall, at which time the young worms that hatched through the Summer may be generally detected, and easily cut out without injury to the tree. Particular attention should also be paid to any tree that has been injured or sun-scalded, as such trees are most liable to be attacked. Mr. Wier who has had considerable experience with this insect, thus describes his method of doing this work, in the article already alluded to :

“I will suppose I have a young orchard of any number of trees, say a thousand, the second season after planting, about the last of July or during the first half of August, with a common hoe, I take all the weeds and other trash, and about an inch of soil, from the crown of the trees ; then, any time from the first to the middle of September, with a pocket-knife, examine carefully the stem of each tree ; the borer can readily be found by the refuse thrown out of the hole made on entering—this refuse of a borer, of the same season’s growth, will be about the size of a pea, and being of a glutinous nature, sticks around the mouth of the hole, and can readily be seen ; older ones throw out coarser chips that fall to the ground. (As already shown, these chips are not thrown out by the borer, but are forced out by the swelling.) When he is found, take the knife and cut him out. If an orchard is carefully examined in this way each year, there need be but very few, if any, borers missed ; and, as they are more easily found the second Fall of their growth, and can have done but little damage up to that time, we could never receive any serious injury from them. Now, it is no great task to do this ; a man will clear the litter and soil from around a thousand trees in a day, and take the borers out in another day. I will agree to do both jobs carefully in one day’s time. A great undertaking, is it not ?”

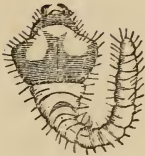
He also has observed that some varieties of the apple tree have a greater immunity from the attacks of this borer than have others ; on account of the young larva, when it is first hatched, being *drowned out* by the sap, but he does not mention any particular varieties other than those that are the “more vigorous and late growing.”

THE FLAT-HEADED APPLE TREE BORER.

Chrysobothris femorata, Fabr.

[Coleoptera, Buprestidæ.]

[Fig. 15.]



[Fig. 16.]



This borer, which is represented in the larva state at figure 15, may at once be recognized by its anterior end being enormously enlarged and flattened. It is paler than the preceding, and makes an entirely different burrow. In consequence of its immensely broad and flattened head, it bores a hole of an oval shape and twice as wide as high. It never acquires much more than half the size of the other species, and is almost always found with its tail curled completely round towards the head. It lives but one year in the tree and produces the beetle, represented at figure 16, which is of a greenish black color, with brassy lines and spots above, the under side appearing like burnished copper. This beetle flies by day instead of by night, and may often be found on different trees basking in the sunshine. It attacks not only the apple, but the soft maple, oak and *peach*, and is said to attack a variety of other forest trees; though, since the larva of the family (BUPRESTIDÆ) to which it belongs all bear a striking resemblance to each other, it is possible that this particular species has been accused of more than it deserves.

It is, however, but far too common in the Valley of the Mississippi, and along the Iron Mountain and Pacific railroad it is even more common than the preceding species. Mr. G. Pauls, of Eureka, informs me that it has killed fifty trees for him, and Mr. Cataw, and many others in that neighborhood have suffered from it in like manner.

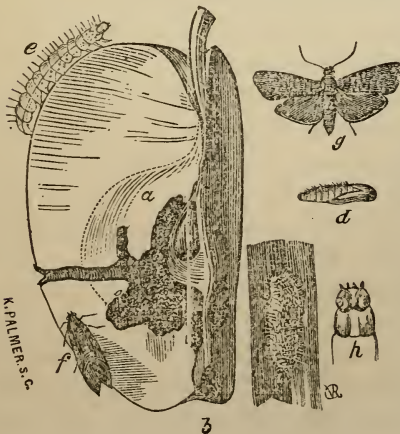
“REMEDIES.—Dr. Fieth found that this borer was attacked by the larva of some parasitic fly, belonging probably to the *Chalcis* family, but it is greatly to be feared that this parasite is as yet unknown in the West. At all events, this flat-headed fellow is far more common with us than with our Eastern

brethren. As this beetle makes its appearance during the months of May and June, and as the eggs deposited on the trunk of the tree, as with the preceding species, the same method of cutting them out or scalding them can be applied in the one case as in the other; while as the soap preventive is found to be equally effectual with this species as with the other. It must, however, be applied more generally over the tree, as they attack *all parts of the trunk*, and even the larger limbs.

THE CODLING MOTH OR APPLE WORM.

(*Corpocapsa pomonella*—Linn.)

“The apple worm I find to be quite common all over the State, as it is in almost all parts of the civilized world where apples are grown. Dr. Trimble has devoted page after page to the consideration of this little pest, and yet its whole history, and the means of preventing its insidious work, may be given in a very few lines. It was originally a denizen of the Old World, but was introduced into this country about the beginning of the present century. The following figure represents it in all its states, and gives, at a glance, its natural history: *a* represents a section of an apple which has been attacked by the worm, showing the burrowings and channel



of exit to the left; *b*, the point at which the young worm entered; *c*, full grown worm; *d*, its head and first segment magnified; *e*, the cocoon which it spins; *f*, the chrysalis to which it changes; *g*, the moth which escapes from the chrysalis, as it appears when at rest; *h*, the same with wings expanded. The worm when young is whitish, with

usually an entirely black head, and a black shield on the top of the first segment. When full grown it acquires a flesh-colored or pinkish tint, especially on the back; and the head and top of the first segment become more brown, being usually marked as at figure 24, *h*. It is sparsely covered with very minute hairs which take their rise from minute elevated points, of which there are eight on each segment. The cocoon is invariably of a pure white on the inside, but is disguised on the outside by being covered with minute fragments of whatever substance the worm spins to. The chrysalis is yellowish brown, with rows of minute teeth on its back, by the aid of which it is enabled to partly push itself out of its cocoon, when its time to issue as a moth arrives. The moth is a most beautiful object; yet, as has been well remarked by an anonymous writer,* from its habits not being known, it is seldom seen in this state, and the apple grower, as a rule, 'knows no more than the man in the moon to what cause he is indebted for the basketfuls of worm-caten windfalls in the stillest weather.' Its fore wings are marked with alternate, irregular, transverse, wavy streaks of ash-gray and brown, and have on the inner hind angle a large tawny brown spot, with streaks of bright bronze color or gold.

The apple is, so to speak, our democratic fruit, and while stone fruit is grown but in certain regions, this is cultivated all over the country. The Codling moth is, then, even more injurious than the Curculio. Unlike the Curculio, it is mostly two-brooded, the second brood of worms hibernating in the larval state, enclosed in their snug little silken houses, and ensconced under some fragment of bark or other shelter. The same temperature which causes our apple trees to burst their beautiful blossoms, releases the Codling moth from its pupal tomb, and though its wings are at first damp with the imprint of the great stereotyping establishment of the Almighty, they soon dry and expand under the genial Spring-day sun, and enable each to seek its companion. The moths soon pair, and the female flits from blossom to blossom, deftly depositing

* Entomological Magazine, London, Vol. I, p. 1, 144.

in the calyx of each a tiny yellow egg. As the fruit matures, the worm develops. In thirty-three days, under favorable circumstances, it has become full-fed; when, leaving the apple, it spins up in some crevice, changes to a chrysalis in three days, and issues two weeks afterwards as a moth, ready to deposit again, though not always in the favorite calyx this time, as I have found the young worm frequently entering from the side of the apple. Thus the young brood of Codling moths appear at the same time as the young curculios, the difference being that instead of living on in the Fall and Winter, as do the latter, they deposit their eggs and die, it being the progeny from these eggs which continues the race the ensuing year. Though two apples, side by side, may, the one be maturing a Curculio, the other a Codling moth, the larva of the latter can always be distinguished from the former by having six horny legs near the head, eight fleshy legs in the middle of the body, and two at the caudal extremity, while the curculio larva has not the first trace of either.

In latitude 38° the moths make their appearance about the first of May, and the first worms begin to leave the apples from the 5th to the 10th of June, and become moths again by the fore part of July. While some of the first worms are leaving the apples, others are but just hatched from later deposited eggs, and thus the two broods run into each other; but the second brood of worms (the progeny of the moths which hatched out after the first of July) invariably passes the Winter in the worm or larval state, either within the apple after it is plucked, or within the cocoon. I have had them spin up as early as the latter part of August, and at different dates subsequently till the middle of November, and in every instance, whether they spun up early or late in the year, they remained in the larval state until the middle of April, when they all changed to chrysalides within a few days of each other. Furthermore, they not only remain in the larval state, but in many instances where I have had them in a warm room, they have been *active* throughout the Winter, and would always fasten up cuts made in their cocoons, even when the operation was performed five and six times on the

same individual. These active worms perfect themselves in the Spring as well as those which had not been disturbed; and this fact would indicate that the torpid or dormant state, so called, is not essential to the well being or the prolongation of the life of some insects.

Though the Codling moth prefers the apple to the pear, it nevertheless breeds freely in the latter fruit, and I have myself raised the moth from the pear-boring larva, and the fact was recorded many years ago by the German entomologist, Kollar. It also inhabits the fruit of the crab-apple and quince, and is not even confined to pip fruit, for Dr. T. C. Hilyard, of St. Louis, bred a specimen, now in my cabinet, from the sweetish pulp of a species of screw-bean which grows in pods; and which was obtained from the Rocky Mountains, while Mr. Wm. Saunders, of London, Ontario, Canada, has also found it attacking the plum in his vicinity.* This is entirely a new trait in the history of our Codling moth, and is another evidence of the manner in which certain individuals of a species may branch off from the old beaten track of their ancestors. This change of food sometimes produces a change in the insects themselves, and it would not be at all surprising if this plum-feeding sect of the codling moth should in time show variations from the normal pip-fruit feeding type. As Mr. Saunders is a well known entomologist, it is not likely that he has been mistaken in the identification of the species, for the only other worm of this character which is well known to attack the plum in America, is the larva of Mr. Walsh's plum moth (*semasia prunivora*), which is a very much smaller insect than the Codling moth. Mr. Saunders says that his plum crop suffered considerably from this cause, and that the operation appeared to be performed by the second brood, the plums falling much later than those stung by the curculio—remaining, in fact, on the tree till nearly ripe. I do not think that this insect has yet acquired an appetite for the plum in the States. As a gene-

* Report of the Commissioner of Agriculture and Arts, of the Province of Ontario, for the year 1868.

ral rule, there is but one worm in each apple, but two are sometimes found in one and the same fruit.

REMEDIES.—Though with some varieties of the apple the fruit remains on the tree till after the worm has left it, yet by far the greater portion of the infested fruit falls prematurely with the worm to the ground; hence much can be done towards diminishing the numbers of this little pest by picking up and destroying the fallen fruit as soon as it touches the ground. For this purpose hogs will again be found quite valuable, when circumstances will allow of their being turned into the orchard. Abundant testimony might be given to prove this, but I make room only for the following from Mr. Suel Foster, of Muscatine, Iowa, whom I know to be abundantly capable of forming a proper judgment:

“I have twenty-four acres of my orchards seeded to clover. and last year I turned the hogs in. I now observe that where the hogs ran last year the apples have not one-fourth the worms that they have on other trees. I this year turned the hogs into my oldest (home) orchard.*

“Mr. Huron Burt, of Williamsburg, Mr. F. R. Allen, of Allenton, and Mr. Carnum, of Sulphur Springs, have also, each of them, testified to me as to the good effects obtained from allowing hogs to run on their orchards.

“There is, however, a more infallible remedy, and one which is always practicable. It is that of entrapping the worms. This can be done by hanging an old cloth in the crotches of the tree, or by what is known as Dr. Trimble’s hay-band system, which consists of twisting a hay-band twice or thrice around the trunk of the tree. To make this system perfectly effectual, I lay down the following rules:

“1st. *The hay-band should be placed around the tree by the first of June (in Missouri), and kept on till every apple is off the tree; 2d. It should be pushed up or down, and the worms and chrysalides crushed that are under it, every week, or at the very latest, every two weeks; 3d. The trunk of the tree should be kept free from old rough bark, so as to give the worms no other places of shelter; and 4th, the ground itself*

*Transactions Illinois State Horticultural Society, 1867, page 213.

should be kept clean from weeds and rubbish." (By following this advice the benefits of *mulching* must be lost. It were better, however, to lose this advantage than to have much premature and wrong fruit.)

"But as already stated on a previous page, many of the worms of the second brood still remain in the apples even after they are gathered for market. These wormy apples are barreled up with the sound ones and stored away in the cellar or in the barn—from them the worms continue to issue, and they generally find plenty of convenient corners about the barrels in which to form their cocoons. Hundreds of these cocoons may sometimes be found around a single barrel, and it therefore becomes obvious that, no matter how thoroughly the hay-band had been carried during the Summer, there would yet remain a sufficiency in such situations to abundantly continue the species another year. And when we consider that every female moth which escapes in the Spring lays from two to three hundred eggs, and thus spoils so many apples, the practical importance of thoroughly examining, in the spring of the year, all barrels or other vessels in which apples have been stored becomes apparent. It should, therefore, also be made a rule to destroy all the cocoons which are to be found on such barrels or vessels either by burning them up or by immersing them in scalding-hot water.

"Now there is nothing in these rules but can be performed at little trouble and no expense. Their execution must henceforth be considered a part of apple-growing. Let every apple-grower in Missouri (and throughout the country) carry them out strictly, and see that his neighbors do likewise, and fine, smooth, unblemished fruit will be your reward.

"The philosophy of the hay-band system is simply that the worms, in quitting the fruit, whether while it is on the tree or on the ground, in their search for a cozy nook, in which to spin up, find the shelter given by the hay-band just the thing, and in ninety-nine cases out of a hundred they will accept the lure, if no other more enticing be in the way. I have *thoroughly tested this remedy the past Summer*, and have found it far more effectual than I had anticipated wherever

the above rules were recognized. Under two hay-bands which were kept around a single old isolated tree through the months of June, July and August, I found every week of the two last months an average of fifty cocoons.

“I have often smiled in my journeyings through the State to see the grin of incredulity spread over the face of some unsophisticated farmer as I recounted the natural history of this codling moth, and urged the application of the hay-band. Magic spell or fairy tale could not more thoroughly have astounded some of them than the unmasking of this tiny enemy and the revealing of the proper remedy.

“The burning of fires has been recommended, under the supposition that the moths will fly into them and get destroyed. I have no faith whatever in the process, so far as it regards this particular species; for though it is true that the moths fly and deposit their eggs in the evening, I do not believe they are attracted to the light as are some others, for I have never been able thus to attract any myself.”

WEIR'S CODLING MOTH TRAP.

The more modern and better remedy is “Weir's Trap,” made of three narrow boards or old shingles, movable on a centre screw, and fastened to the trunk of the tree. The American Pomological Association, during its session at Richmond in 1871, appointed a committee composed of three members—Charles Downing, Mark Miller and P. T. Quinn. The committee reported that on examination *Weir's Codling Moth Trap* was found efficient in trapping this most destructive insect.

CLIMBING CUT WORMS.

Orchardists in Spring frequently find the hearts of their fruit buds—on young trees especially—entirely eaten out and destroyed, and this circumstance is attributed to various causes, winged insects, beetles or slugs, or even to late frosts, unsuitable climate, etc. Never have cut-worms received the blame, all of which should be ascribed to them, for the game hold of many on a sandy soil in early Spring is the fruit-tree,

and especially the dwarf apple or pear. This is a very important fact to fruit-raisers, whose orchards or gardens are infested by these stealthy, naked caterpillars, who do all their mischief under cover of night, which accounts for their never having been noticed in their work of destruction in former years. After having performed their nightly work, they descend and take quarters just under the surface of the ground near the foot of the tree. They seldom descend the tree as they ascend it, by crawling, and it is quite interesting to watch one at early morn when it has become full fed, and the tender skin seemed ready to burst from repletion, and see it prepare by a certain twist of the body for the fall. This fact also accounts for trees on hard, tenacious soil being comparatively exempt from them, as their instinct doubtless serves them a good turn either in preventing them from ascending or by leading the parent moth to deposit her eggs by preference on a light soil.

Mr. J. W. Cochran, of Calumet, Illinois, says:

“They destroy low-branched fruit trees of all kinds, except the peach, feeding on the fruit buds first, the wood buds as a second choice, and preferring them to all other things, tender grape buds and shoots (to which they are also partial) not excepted—the miller always preferring to lay her eggs near the hill or mound over the roots of the trees in the orchard; and if, as is many times the case, the trees have a spring-dressing of lime or ashes with the view of preventing the May beetles’ operations, this will be selected with unerring instinct by the miller, thus giving her larva a fine warm bed to cover themselves up in during the day from the observations of their enemies. They will leave potatoes, peas and all other young green things for the buds of the apple and pear. The long naked young trees of the orchard are almost exempt from their voracious attacks, but I have found them about midnight, of a dark and damp night, well up in the limbs of these.”

Mr. John Townley, of Marquet county, Miss., in the *Practical Entomologist*, says: “On a warm dewy night, about the middle of May, I took a lamp and, going into the

orchard, suddenly jarred several of the trees, when some of these worms came tumbling to the ground. The evidence against them would have been more conclusive, if I had searched the branches and found them there and at work. That, however, I omitted to do. I have had fruit trees planted here sixteen years, but never had the buds destroyed so as to attract my attention before the last two years. (When these cut worms have free and full pasture of herbaceous plants, it is believed they will not trouble themselves to mount the fruit trees, but in the absence of such food the buds of trees are appropriated with avidity.) The habit of the dwarf apple and pear, however, just suits their nature, and much of the complaint of those people who cannot make trees thrive on a sandy soil, has its source and foundation here, though apparently utterly unknown to the orchardist."

REMEDY.—"There is no known remedy; salt has no properties repulsive to them—they burrow in it equally as quick as in lime or ashes. Tobacco, soap and other diluted washes do not even provoke them; but a tin tube six inches in length, opened on one side and closed around the base of the tree, fitting close and entering at the lower end an inch into the earth, is what the lawyers would term an effectual estoppel to farther proceedings."

There is no complaint of this pest in Virginia, or, at least, in the hilly or mountainous regions of the State. If it exists, to any extent, in the more level or sandy portions of the Atlantic States, we have not heard of it.

THE BARK LICE OF THE APPLE TREE.

(Homoptera Coccidæ.)



There are two species of bark lice that attack the apple tree in the United States, which I will briefly describe.

The first, which is a native North American insect, is now known as 'Harris'

bark louse (*Aspidiotus Harrisii*, Walsh). The color of the scale is dirty white, and its form is irregular, being usually egg-shaped; but however variable its outline, it is always quite flat, and causes the infested trees to wear the appearance of figure 1, while the minute eggs which are found under it in Winter time are invariably blood-red or lake-red. This species has scarcely ever been known to increase sufficiently to do material damage, for the reason doubtless that there have, hitherto, always been natural enemies and parasites enough to keep it in due bounds.

The second species, which is known as the oyster-shell bark louse (*Aspidiotus conchiformis*, Gmelin), is by no means harmless, however, for it is one of the most pernicious and destructive insects which the apple-grower in the Northern States has to contend with. This species presents the appearance of figure 2, and may always be distinguished from the former, by having a very uniform muscle-shaped scale of an ash-gray color (the identical color of the bark), and by these scales containing, in the Winter time, not red, but pure white eggs.

“There is scarcely an apple orchard in North Illinois, in Iowa, or in Wisconsin, that has not suffered more or less from its attacks, and many a one has been slowly bled to death by this tiny sap-sucker. It was introduced into the Eastern



States more than twenty years ago from Europe, and had already reached as far west as

Wisconsin in 1840 from the districts bordering on Lake Michigan. It occurs at the present time in Minnesota and Iowa, but whether or not it extends westward beyond the Missouri river, there are no data to show.

“REMEDIES.—Small trees can be easily managed, as the terminal twigs can be reached and rubbed with strong soap water or syringed with the same. But alkaline washes will have little effect unless applied about the time the eggs are hatching, and the young lice are crawling over the limbs, which happens during the last of May or early in June.

With regard to washes, one pound of sal soda to one gallon of water will have a very good effect. Another remedy is to mix one part of soft soap with four parts of water and a little fresh slacked lime. Another—a solution of one pound of potash to two gallons of water, applied when the lice begin to crawl about the branches. A lye of wood ashes is also recommended for the same purpose.”

We have never seen apple trees much injured by these insects, nor have we ever heard of their depredations to any extent in the South.

THE CANKER WORM.

(*Anisopteria pometaria*, of Harris.)

In some parts of the country, especially at the North and on the seacoast, this insect is very destructive to the apple tree by destroying the blossoms and foliage, and even the very young and tender fruit. They are seldom troublesome in the Piedmont region of Virginia or in the corresponding portions of Maryland and North Carolina. They may be seen, however, on the isolated limbs of some trees, the leaves of which are completely riddled and devoured by them, and, when so employed they may be easily destroyed by cutting off the twigs. The *Dutch Elm*, however, in our latitude suffers greatly by this depredator. They completely desolate the trees and render them as naked as at midwinter—not one tree or branch escapes them—and during the hottest part of the Summer these handsome trees are entirely useless as shade trees. A second crop of leaves, however, begin to appear about the 1st of September, and become about half grown before the early frost takes them. This second crop of leaves is not molested, it being too late for the operations of this insect.

The Canker worm usually rises out of the ground very early in the Spring, chiefly in March, as soon as the ground is free from frost. The females having no wings, climb slowly up the trunks of the trees, while the winged males hover about

to pair with them. Very soon after this, if we examine the trees, we shall see the eggs, of which every female lays some sixty or a hundred, glued over, closely arranged in rows and placed in the forks and branches and among the young twigs. About the 20th of May and up to the 1st of June, these eggs are hatched and the canker worms, dusky brown, or ash-colored, with a yellow stripe, make their appearance and commence preying upon the foliage. When they are abundant they make rapid progress, and in places where the colony is firmly established, they will sometimes strip an orchard in a few days, making it appear as if a fire had passed over it. After feeding about four weeks, they descend into the ground three or four inches, where they remain in a chrysalis state to emerge again the next season. As the female is not provided with wings they do not spread very rapidly from one place to another; but when their food becomes scarce they travel in all directions, and to a considerable distance, frequently entering houses, as in case of the elm worms, making themselves very troublesome and pestilent.

REMEDIES.—The common mode of protecting apple trees is to surround the trunk with a belt or bandage of canvass three or four inches wide which is then thickly smeared with tar. A little train oil is sometimes mixed with it to prevent it from becoming hard. The better plan to protect the trees from crawling insects of this nature is to provide each tree with a smooth piece of tin three or four inches wide, as has been recommended in the case of some other insects. These tin belts should fit well around the trunk and extend into the ground some two inches, if that is practicable, if not, the space between the lower end of tin and the tree should be kept perfectly tight with clay or lime and sand mortar. It is believed that trees thus treated will be securely protected from the ravages of this as well as other climbing insects. There are various other remedies for this destructive worm, but the above is deemed sufficient. Young trees, with smooth bark, if well soaped once or twice in Spring and Fall, are well protected from all insects that crawl up the trunk of trees.

AMERICAN TENT CATERPILLAR.

(Clisiocampa Americana.)

This well known insect is so common that a description of it is unnecessary. It is simply called *the caterpillar of the orchards*. Its habits and mode of operation are so well known that no descriptive account is worth a place here. Although a great pestilence in an apple orchard, they are more easily managed than any other insects injurious to the apple tree or its fruit. If, however, they are suffered to increase unmolested they become a formidable enemy.

REMEDIES.—Various simple modes have been found sufficient for the destruction of these greedy traveling fellows. On small trees they may be stripped off with the hand and crushed with the foot. For large trees, use a pole with a sponge attached to the end dipped in spirits of ammonia or kerosene, or use a pole with a brush or cloth attached to the end, and work it about in the nests, or twist them out with the end of the pole. They are always at home up to 9 o'clock, and should be operated upon previous to that time.

FRUIT DRYING HOUSE.

The business of drying fruit for market is a very profitable one, and we wonder that so few people engage in it. It is also very desirable to provide a full supply for family use. With the improved apple-peelers and parers and peach-peelers, and a drying-house well arranged, it is light, nice work for the members of the family who cannot and are not expected to engage in out-door farm work—such can be employed to great advantage in fruit time, having the above mentioned facilities furnished them.

DESCRIPTION OF A DRYING HOUSE USED IN THE VALLEY OF VIRGINIA.—“The *Dry house* at Detrick's is of brick, one brick thick, on a stone foundation a foot high. The brick part is four feet ten inches high, seven feet one inch square from out to out, with a door in one side two feet three inches wide, and as high as the house will admit. In each end there

are three rows of frames, with two openings each, large enough to admit drawers two feet nine inches wide and three inches deep, making six drawers at each end. These drawers are made with slats in the bottom an inch wide and one sixteenth of an inch apart. On the inside of the house there are three pieces of laths three inches wide by one inch thick, built into the wall on each end as far as the door will admit, so as to support the inner end of the drawers; they are just opposite the lower edge of the frames that hold the drawers; there are also strips that run from the frames to the laths to hold the drawer and guide it as it runs in. Each drawer has two knobs to draw it out with. The top frame that holds the drawer is two rows of brick from the top and there is one row of brick between the frames. On the top of the brick work is a frame and tight floor, and on the floor is built a brick chimney for stove-pipe. Over all is a good shingle roof put on as other houses (where slate is convenient it would be better), and the gables weatherboarded up. It has a good stove in the centre of the house."

The above is a description of Mr. Detrick's house; but it is probably better that the dry house be made of timber, and made larger, where there is much fruit. It has been found that the brick ones are rather damper than the wood, and do not dry fruit quite so well. Besides being larger, there should be more space between the drawers, so that the hot air can have free access.

From what we know of *dry houses* we think the following simple and cheap house would be as good as the best:

Take four posts 4 or 6 inches square, and plank them together as if you were making a goods box, using dry inch plank and making the joints tight. We would make it 12 feet by 10, and six feet high in front, and five behind—cover it tight by laying the plank close, and break the joints with narrow plank on top. Then bore holes in the sides of the house and put poles across to hold the dryers, which may be those commonly used to dry in the sun, making three or four tier of poles on each side of the stove. The door should be made in the high side and made tight. A house of this de-

scription will cost but little, and any coarse carpenter can make it.

FRUIT LADDERS.

The farmer can generally have ladders very suitable for fruit gathering made at home, and unless he has facilities for purchasing from the manufacturer or his agents he had better do so.

They are generally made of white or yellow pine, sound and well seasoned. They are sometimes made of hickory, in which case, in consequence of the stiffness and strength of the timber the side pieces may be comparatively small, and the ladders made very portable. The proper size of the timbers or scantlings used for this purpose varies according to the strength of the material used and the different lengths required. For a 10 or 12 feet ladder, made of pine or poplar, 3 or $3\frac{1}{2}$ x 2 inches would be about right; 6 or 8 feet ladders less in proportion, and longer ones would require more strength. The proper distance of the rounds from each other should be eighteen inches; they should be made of well-seasoned wood, tightly fitted into one inch holes, and no sharp edges should be left on any of the parts, as they would cut or bruise the tender bark of the branches of the trees. Folding ladders are very portable and convenient.

Fruit ladders may be obtained at the agricultural warehouses of H. M. Smith & Co., Allison & Addison, and at other establishments in Richmond, Va., and at various other places. Also, good apple peelers, *and parers and peelers*, and peach peelers.

FRUIT PICKERS.

This useful implement may also be obtained at the agricultural establishment of H. M. Smith & Co., Richmond, and doubtless at other places in the South, as well as at the North. The author has no experience in the use of this labor-saving invention, but an eminent nurseryman and orchardist informs him that it is astonishing with what ease and rapidity fruits may be gathered when the operator has the advantage of a

little practice. Every fruit grower should provide himself with one or more of these implements.

MANUFACTURE OF CIDER.

Cider, or Cyder, a sharp, cool, vinous beverage made by fermenting the juice of apples. Some connoisseurs in this liquor are of opinion, that the juice of the more delicate table fruit is generally more cordial and pleasant than that of the more harsh kinds; though others assert the latter to be in many respects preferable. In Virginia, very fine cider is made late in the Fall, with common seedling apples of various qualities, from those most sour and harsh, to those that are sweet and tender. Good cider is also made during the Summer from early seedling varieties. The best keeping cider, and that of the very best quality, is manufactured at the approach of Winter from varieties recommended in this work for that purpose.

There have been numerous receipts published to make cider, some of which have occasioned considerable losses. A few general, and important rules will be given, for insuring good cider, and afterwards some particular directions founded on experience.

1st. The first and indispensable requisite for making good cider, is to choose perfectly ripe and sound fruit, carefully picked and free from trash, leaves and twigs. Farmers, in general, are very inattentive to these points, but it is utterly impossible to make good cider unless they are attended to.

2d. The apples ought to be hand-picked, or *there should be a mulching of straw or soft litter* placed under the trees when they are shaken. When they fall on the ground they become bruised, and, as frequently happens, that they remain some time before pressing, the apples are apt to communicate a bad taste to the liquor from the bruised parts.

3d After having sweated, and before being ground, the apples should be wiped, in order to remove a clammy moisture which covers them, and which, if permitted to remain, would impoverish the cider. This is a little tedious, but it will pay well.

4th. The practice of pressing the pomace in hair cloths is certainly much preferable to the common mode in this country of enclosing it in bands of straw, or lining the press crib with it; because the straw, when heated in the mow or stack, gives the cider a bad taste. The improved cider mills and presses of the present day, however, do not require straw, but the pomace is thrown into the crib, the slats of which are placed so close as not to allow the pomace to escape with the cider.

5th. After cider has run from the press it should be strained through hair or fine wire sieves into a large open vat or hogshead, which will contain a whole making, or as much as can be pressed in one day. When cider has remained in this vat or hogshead a day, or sometimes more or less, according to the ripeness of the fruit of which it has been made, and the state of the weather, the pomace or grosser parts of the pulp, will rise to the top, and in a few hours, or after a day or two at farthest, will grow very thick, and when little white bubbles break through it, draw it off through a faucet hole within three inches of the bottom, that the lees may quietly remain behind. *This operation is of great importance*, as the sinking of the feculent matter would greatly injure the liquor.

6th. On drawing off the cider from the vat, it must be put into *clean casks* and closely watched, to prevent the fermentation; when, therefore, white bubbles, as mentioned above, are perceived at the bung-hole, rack it again; immediately after which it will probably not ferment until March, when it must be racked off as before—if possible, in clear weather.

7th. It is of great consequence to prevent the escape of the *carbonic acid*, or fixed air, from cider, as on this principle all its briskness depends. To effect this, various expedients have been contrived. In the State of Connecticut, where much cider is made, it is a common practice to pour a tumbler of *olive oil* in the bung hole of every cask. Upon the same principle we have lately heard of a man who boasted that he had drunk brisk beer out of the same cask for five years; and that his secret was to cover the surface of the liquor with olive oil. Cider should be racked as seldom as possible, for

a portion of its fixed air and briskness is lost in the operation.

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; every cask must be filled up and closely bunged.

8th. When care has been taken to prevent the precipitation of the feculent matter which rises in the cider, good liquor will generally fine without artificial means, but sometimes it is necessary to fine after the first racking. This may be done effectually in the following way: For a barrel, cut one ounce of isinglass fine, put it into a pint of water, stir it frequently, and make a thick jelly. Dilute this with cider, strain and mix it well with the liquor in the cask, by means of a long, clean stick.

The best apples for cider are those that in growing were exposed to the sun and air, and young orchards generally produce the best cider. The Harrison, and some other fine cider apples make about one barrel to every ten bushels of sound apples.

In all the operations of cider making, strict cleanliness and neatness should be observed, and no water should be used under any circumstances. *The first and last running of the cheese is not so good as the middle.* When pressed out, put in a cool, *dry* cellar before the vinous fermentation takes place—keep the barrels well filled up with the *same liquor*, reserved for that purpose, so that the froth and groser parts may work off. Then keep it as closely bunged as it will bear, without danger of bursting the cask, until it is necessary to rack off. If the casks are in a cool, airy cellar, the fermentation will cease in a day or two, and this state may be known by the liquor becoming clear and bright; by the cessation of the discharge of fixed air; and by the thick crust which has collected on the surface. When that is the case no bunging is necessary until after it is racked off, which must be done whenever the cider is in the situation just described, to prevent the fermentation going too far. It may now be bunged up tight and allowed to stand until Spring; but first, to keep down

any farther fermentation, put in about a gill of finely powdered charcoal to every barrel.

If, upon examination, a scum collects on the surface, and the fermentation seems inclined to proceed further, it must be immediately racked again. The vent spile may now be driven in tight; but examined occasionally. About the 1st of March a final racking should take place, and the dissolved isinglass, as has already been recommended, should be put in each cask, which will render it perfectly clear. It may be bottled now, or any time before the blossoming of the apple, or afterwards, even late in May.

When bottling, fill the bottles within an inch of the bottom of the cork, and allow the bottles to stand an hour before the corks are driven in. They should then be sealed, and kept in a cool, dry cellar, with clean, dry sand up to their necks, or laid on their sides in boxes with sand between each layer.

A friend directs the cider to be bottled in July; to fill the bottles within two inches of the top, letting them stand twelve hours open before corking. Use strong porter bottles, and the best velvet corks. The bottling should always be done in clear weather.

Cider is a cooling, pleasant, and wholesome liquor during the heat of Summer, and at any time, if it has been prepared without foreign ingredients, and properly fermented. On the contrary, when it is too new, or tart, or has, perhaps, been kept in leaden vessels, it cannot be recommended as a salubrious beverage; because that poisonous metal is easily dissolved by acid. Good cider is the wine of America.*

The domestic manufacture of cider is worse managed than any in our country; perhaps the better way to correct errors is to point out some of the principal ones, and then to recommend better plans—and we are continuing this subject with these objects in view.

Apples are commonly collected when *wet*, and thrown in a heap, exposed to the sun and rain, until a sourness pervades

* Dr. H. Teter, an eminent physician, of Ohio, remarks: "Cider made of ripe apples, properly fermented, and racked or purified, is of all fermented liquors the most innocent and the best." But too little pains is taken with cider. It may be made, by care and proper management, as fine flavored and as clear as wine.

the whole mass, then ground, and for want of a trough or other vessels sufficient to hold a cheese at a time, the pomace is put in the press as fast as ground; and a large cheese is made, which requires so much time to finish and press off, that a fermentation commences before all the juice is out; and certain it is, that a small quantity of the juice pressed out after fermentation comes on, will spoil the product of a whole cheese, if mixed therewith. When either of the above errors will spoil cider, we need not wonder at the effect of a combination of the whole, as frequently happens.

An experienced cider maker of New Jersey says: "As I have often exported cider to the West Indies, and to Europe, and also sold it to others for the same purpose, without even hearing of any spoiling; and as it is my wish to make the productions of our country as useful as possible, I will give an account of my method of making this valuable liquor.

"I gather the apples when dry, put them on a floor under cover, and have a trough large enough to hold a cheese at once, and when the weather is warm, grind them *late in the evening*, spreading the pomace over the trough to air it, as the cider will thereby be much improved and enriched, and a fine amber color in it produced; and here it may be remarked, that the *longer a cheese lies after being ground, before pressing, the better for the cider, provided it escapes fermentation*, until the pressing is completed. The following experiment will render this evident. . . . Bruise a tart apple on one side, and let it lie until brown; then taste the juice of each part, and it will be found, that the juice of the bruised part is sweet and rich; so if sweet and tart apples are ground together, and put immediately on the press, the liquor which they produce will have the taste of both kinds of fruit; but if permitted to lie until the pomace *becomes brown*, the cider will be greatly improved.

"I take care to put cider in clean, sweet casks, and the only way to effect this is to rinse or scald them well as soon as the cider is out, and not to permit them to stand with the lees, which will certainly cause them to become sour, musty, or to smell. When my casks are filled, I place them in the

shade, exposed to northern air; and when fermentation takes place, I fill them up once or more (with a portion of the same liquor reserved) to cause as much of the feculent matter as possible to discharge from the bung; when a clear white froth comes out, I put in the bung somewhat loosely or drive it a little tight and bore a hole in it, and put in a spile, thereby checking fermentation gradually. After this has subsided, I take the first opportunity of clear, cool weather, and rack it off into clean casks, which I prepare thus: When I have drawn cider out of a cask in which it has fermented, I rinse it with cold water, and put in two or three quarts of fine gravel, and three or four gallons of water; the cask is then well shaken or rolled to scour off the sediment always adhering to the cask, and which, if not removed, will act as a ferment to the liquor when returned to the cask, and spoil or greatly injure the liquor.

“After scouring the cask, I again rinse them, and I find advantage from burning a match of sulphur suspended in the cask by a wire, after putting in two or three buckets of cider. A convenient way to perform this process is to have a long, tapering bung, so that between the two ends it will fit any hole; to the small end of this bung drive a wire with a crooked end to hold the match. If the cider stands a week or more after racking, previous to being put away in the cellar, I rack it again, rinsing the casks, but not with gravel, and remove them to the cellar (which should be as dry as possible). The late made cider, I put in the cellar immediately after or before the first racking, according as the weather may happen to be. The cider intended to be kept till Summer, I rack in cool, clear weather, in the latter part of February or beginning of March; the casks must be kept full, and bunged as tight as possible.”

The writer of the above *fines* his cider with isinglass jelly as has already been directed, 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 it, whether fine or not, in ten or twelve days, lest the sediment should rise, which often happens. He also adds: “The foregoing operation

should be performed previously to the apples being in bloom, but I have succeeded best in the Winter, during steady, cool wheather. I have likewise had good success in fining cider directly from the press; when this is done, I set the casks with one head out, but covered, put in taps, and let them remain in a cool place, properly fixed for drawing. When the fermentation ceases, and the scum begins to crack, I take it off carefully with the skimmer, and draw it from the sediment. If not sufficiently fine before the middle of Winter, I fine it as above."

We entirely agree with the writer in his views and process in cider making, and will add that our experience with regard to keeping the pomace some hours before pressing is, that it is highly beneficial to the quality, and adds a beautiful amber color to the liquor^l. In cool weather it may be kept from the press *twelve hours before pressing*. Some authors insist that the pulp should remain in the vat or trough from twenty-four to forty-eight hours, or even longer, if the weather is cool, in order to heighten the color and increase the saccharine principle.

We append the following recipe, given in the *Germantown Telegraph* by Mr. Nicholas Nall, of Moor county, North Carolina, as containing valuable suggestions:

"HOW TO MAKE CIDER.—All apples fit to be eaten will make good cider. The grand secret is in cleansing it from the filth and dregs as early as possible. Each sort of apples is to be crushed and pressed by themselves. Two kinds of juice, both good, would, if mixed, often make bad cider. Throw out all imperfect, sorry, and sunburnt apples, as well as dust and trash. Crush your apples before much mellowed, as they lose their strength, soundness, and spirit, if too mellow. Let them stand a half a day after being crushed, before putting into the press; then press them slowly; discontinue it as soon as the juice appears thin and watery. The advantage of slow pressure is in making the liquor run pure.

"Let your casks, previously well cleansed, be filled quite full, to permit the froth and pomace to discharge itself at the bung. When the fermentation abates, cover the bung closely with

something that may be lifted by the fixed air that escapes during the future fermentation.

“In a week, rack off the cider carefully, ceasing the moment you observe it to run muddy; now stop the cask more firmly. In ten days rack it off a second time, and in fifteen days a third time. In every instance the cask is to be cleaned and perfectly filled; and when filled for the last time, to be bunged close in a deep, dry cellar, never to be moved, until drawn for use.

“Late cider need not be racked until March, and then one racking, or at the most, two, will be sufficient.

“Be very careful that no water, not even the little that will adhere after rinsing the cask, is mixed with the cider. The smallest quantity of rain water will render the cider unfit to keep. The addition of any quantity of distilled spirits is not only useless but injurious.

“Mr. Nall’s method is the result of long experience, and its success justifies me in recommending it to the public. I hope it will be tried.

“I ought to have mentioned that Mr. Nall told me that he had for many years tried various plans for clarifying cider, to prevent its souring, by means of milk, isinglass, scalding and skimming, filtering through sand, &c., and found all useful, but is satisfied that frequent racking or drawing is far preferable to any other method he has attempted.”—J. W. P., in *Germantown Telegraph*.

HOW TO DRY APPLES.

The following advice, if carefully followed, will insure a ready market and high prices for this valuable commodity.

In collecting the fruit for drying, carefully assort it, and select all the sound and perfect apples. Pare and core these carefully, then slice and dry without allowing them to get wet. See that they are not exposed to dust, and as soon as dried, put away carefully until ready for market. Follow these directions as near as you can in every particular, and when you offer them for sale you will readily realize from two

to three cents a pound more than the price of those dried in the ordinary way.

CIDER VINEGAR.

VINEGAR is an agreeable pungent acid, which is obtained from cider, wine, beer, or other fermented liquors.

The principal requisites to form good vinegar, according to PARMENTIER, are: 1st, Contact with the air; 2d, A temperature not exceeding 77° of Fahrenheit; 3d, The addition of some extraneous vegetable matter to promote acetous fermentation; and 4th, The presence of *alcohol*. This last requisite has not been generally known in the United States; its importance, however, was discovered by Col. ANDERSON, of New York, many years ago, and before PARMENTIER wrote; and he has since been in the practice of adding some *cider spirit* (apple brandy) to make cider vinegar, during the progress of the acetous fermentation.

“The inhabitants of the cider-perry cantons,” says PARMENTIER, “make vinegar of these two liquors thus: in a cask of 800 pints they mix six pounds of sour (*aigre*) yeast (made with leaven and rye flour) with hot water, and pour it in the cask; after agitating it with a stick, they let it remain, and in six or eight days, vinegar of good strength is produced. It is very necessary to draw off *this vinegar* as soon as done, because it is more subject to become vapid than wine-vinegar. The bung, when vinegar is made in this way, should be kept close.

Mr. JOSEPH COOPER makes his vinegar of good-bodied sweet cider; fills the barrels one-third full, and permits it to stand with the bung-holes slightly covered for at least nine months. If fermentation does not proceed with sufficient rapidity he draws off a few quarts of the liquor, and, after boiling and skimming it, returns it again to the cask. Mr. COOPER confirms the utility of the practice of adding cider or rye spirit to weak vinegar to increase its strength.

Mr. WM. SHEAFF, of Philadelphia, adds one quart of ripe and bruised sumach-berries, after being boiled with half an

ounce of cream of tartar, to every barrel of cider destined for vinegar.

Cider vinegar is very valuable for market purposes and for domestic uses. In the South, where the summers are long and hot, it is made by fermenting new cider in a warm room or shed fronting the south; or, exposed to the sun with the bung loose in the open air; under ordinary circumstances, without any other aid it will become good vinegar in the course of a few weeks, especially if it be made in the early part of the Summer.

The apples best adapted to this use are the early seedlings and fruit from isolated trees on the farm, or any early ripening apples that are not so good for other purposes. The cider for vinegar should be made from ripe, sound apples, as early in Summer as the maturity of the fruit will allow—and it may be put in sour barrels. It is not proper to rack it off at all, nor does it need any foreign ingredients to add to its strength or body, provided it has time to go through a proper fermentation—by Fall it may be good vinegar, but it will not attain perfection until the next Summer. There are various receipts for making vinegar, or adding to its strength, with which most farmers are acquainted. We, however, prefer none of them, but choose to let the liquor take its natural course. The vinegar should not be put in a cellar, unless it be a very dry one. The casks should be often examined lest they may be found empty, as the worms frequently perforate the barrels and all is lost.

There is a method of procuring a very powerful *essence of vinegar*, which can be practiced only in very cold weather. It simply consists in exposing this liquor in basins, or other shallow vessels, when the watery parts are converted into ice, but the spirituous or acetous basis remains in a fluid state; so that, by repeated exposure, one pint of strong vinegar will be reduced to about a tablespoonful of essence. This preparation possesses a fine flavor and a most pungent taste, and is valuable for particular purposes.

HINTS FOR SOUTHERN FRUIT GROWERS.

P. J. Berckmans, of Augusta, Ga., states in a paper read

before the Pennsylvania Horticultural Society, that the Summer apples of the North generally improve in quality when raised in the Southern States; the Fall apples are of little value; and the Northern Winter apples prove worthless, dropping their fruit in August before they are perfected. *New Southern Winter apples* are coming into cultivation that will keep up the supply until April or May. It is important to train the trees with low heads, so as to shade the stem from the hot sun of this climate, and to prune so as to preserve compact heads that shall produce fruit near the centre. The trees begin to bear early, some producing remunerative crops the third year after transplanting. In the nursery, the trees often attain the height of ten feet in a single season.

PEACH CULTURE.

CONTAINING

PRACTICAL INSTRUCTIONS

FOR THE

CULTIVATION AND MANAGEMENT

OF THE

PEACH TREE AND ITS FRUIT,

AS ADAPTED TO

Southern and Southwestern Climates,

WITH ILLUSTRATIONS.

ALSO

COPIOUS LISTS OF THE BEST FRUITS,

Embracing all the Information

NECESSARY TO SUCCESSFUL CULTURE.

“There is not only comfort and health, but money in fruits.”

“To neglect the culture of fruits is to forego one of the highest pleasures of a country life.”—R. H. BRYAN.

THE PEACH.

(FR. *pêche*; IT. *pesca*; AM. *pechesen*; DUTCH *persickkeboom*; SPANISH *El Melocoton*; *Persica vulgaris*, DEC.; *Rosaceæ*, of botanist.)

This well known tree, and its fruit, of the genus *Persica Amygdalus*, of many varieties, is a native of warm or temperate climates, and was originally brought by the Romans from Persia to Italy in the time of the Emperor Claudius, and from thence disseminated throughout Europe and other parts of the world. It was introduced into this country about the year 1629. The stones were ordered by the "Governor and Company of the Massachusetts Bay in New England in that year.

Both the peach and nectarine, as well as apricots, are mentioned by Beverly as growing abundantly in Virginia in 1720. Some of the former are represented to have been twelve or thirteen inches in circumference. They were raised so easily that some cultivators planted orchards of them purposely for feeding hogs, while others made a drink of them called "mobby," which either was drunk as cider, or distilled into brandy.

Peach trees, as well as those of the quince, are mentioned by Colden as having been killed by frost, in the province of New York, in 1737, but the apple and pear trees were not hurt by the cold.

The peach was introduced into Louisiana by the Spaniards prior to its settlement by the French, where it has been since grown spontaneously, and in many respects apparently indigenous.

This tree was introduced at Easton, Talbot county, Maryland, by George Robbins, in about 1735. The stones were received from Peter Collinson, of England, together with the seeds of that year.

In the United States, the peach thrives and is matured as

far North as Boston, northward of which it usually fails. It is well adapted to all the Southern States, except in some low maritime districts. Throughout the Southwestern and most of the Western States, it flourishes and attains its greatest perfection, growing spontaneously in fence corners, on road sides and lanes.

This delicious fruit is never raised in England, and not generally in France, without the aid of walls. China and the temperate portions of the United States are, therefore, the only countries where the peach and apple attain their highest perfection in the open orchard. The peaches of some parts of China are said to be the finest in the world, and of double the usual size. "It is worthy of remark," says a good writer, "that the peach tree seems to hold very much the same place in the ancient Chinese writings, that the tree of knowledge of the old Scriptures, and the golden Hesperides apples of the heathens do in the early history of western nations. The traditions of a peach tree, the fruit of which, when eaten, conferred immortality, and which bore only once in a thousand years—and of another peach tree of knowledge, which existed in the most remote period on a mountain guarded by a hundred demons, the fruit of which produced death, are said to be distinctly preserved in some of the early Chinese writings. Whatever may have been the nature of these extraordinary trees, it is certain that, as Lord Bacon says, 'not a slip or sucker has been left behind.' We must, therefore, content ourselves with the delight which a fine peach of modern times affords the palate and the eye."

The facility of raising the peach from the seed, remarks a modern writer, has probably tended to its general diffusion throughout the world. This fruit has steadily followed the progress of civilization; and man, from China to Peru, has surrounded himself with the luxury of this and other stone-fruits, very soon after he has begun to taste the blessings of a settled life. There are still spots where ignorance prevents portions of mankind from enjoying the blessings which Providence has everywhere ordained for industry; and there are others where tyranny forbids the earth to be cultivated and

produce its fruits. The inhabitants of the Haouran, who are constantly wandering, to escape the dreadful exactions of some petty tyrant, have neither orchards, nor fruit trees, nor gardens for the growth of vegetables. "Shall we sow for strangers?" was the affecting answer of one of them to Burkhardt. One of the greatest blessings, continues he, that can be conferred upon any rude people (and it is a blessing which will bring knowledge, and virtue, and peace in its train), is to teach them how to cultivate those vegetable productions which constitute the best riches of mankind. The traveler, Burchell, rendered such a service to the Bachapins, a tribe of the interior of Southern Africa. He gave to their chief a bag of fresh peach stones, in quantity about a quart; "nor did I fail," says the benevolent visitor of these poor people, to impress upon their minds a just idea of their value and nature, by telling them that they would produce trees which would continue every year to yield, without further trouble, abundance of large fruit of a more agreeable flavor than any which grew in the country of the Bachapins."

Although it is generally conceded that the peach tree originated in Persia, yet it does not follow, from thence, that it was one of the *natural productions* of that country—and there are still doubts as to what part of the globe this splendid fruit was first cultivated or had its origin. Pliny relates that it had been stated to have possessed venomous qualities, and the fruit was sent into Egypt by the kings of Persia, by way of revenge, to poison the natives; but he treats this story as a mere fable, and considers it the most harmless fruit in the world; that it had the most juice and the least smell of any fruit, and yet caused thirst to those who ate of it. He expressly states that it was imported by the Romans from Persia; but whether it was indigenious to that country, or sent thither from a region still nearer the equator, we have no information. He adds, that it was not long since peaches were known in Rome, and that there was great difficulty in rearing them. He also informs us that this tree was brought from Egypt to the Isle of Rhodes, where it could never be made to produce fruit; and from thence to Italy. He says,

moreover, that it was not a common fruit either in Greece or Natalia. No mention, however, is made of it by Cato. Pownall, in his "Roman Provinces," makes it a Phocæan importation to Marseilles; and evidently it was cultivated in France at an early period, as Columella, in his account of this fruit, says—

"Those of small size to ripen make great haste;
Such as great Gaul bestows, observe due time
And season, not too early or too late."

"According to Royle, it grows in Persia both wild and in a state of cultivation, and flourishes on the Himalayas at elevations of 5,000 to 6,000 feet above the sea.

"The *nectarine* is considered by some as a distinct species; but there can be no doubt on this point, as the peach itself is believed to be nothing more than an improved fleshy almond, which bears a similar relation to the peach and nectarine as the crab does to the apple, and the sloe to the plum. To prove that the peach and nectarine are essentially the same, it may be mentioned that the fruit of both have been found on the same branch; and even various instances are recorded where the fruit had the smooth surface of the nectarine on one side and the downy skin of the peach on the other."

The transformations wrought by horticulturists and pomologists are all but incredible. The peach, which originally was considered a poisonous almond, and used, as some say, to impregnate arrows with deadly venom, has become, by long and judicious cultivation, the most delicious, harmless, and most excellent of all fruits. Cherries are derived from a berry of which a single one only grew on a stem; nectarines and apricots are hybrids of the plum and peach; the chief of esculents, the cabbage, with its relatives, brocolia and cauliflower, came from a marine plant—from the common sea-kale, which shoots up on some sandy shores. From wild, sour crabs, scarcely larger than boys marbles, have proceeded all varieties of apples. The largest and richest of plums are descendants of the black thorn's bitter sloe. Such are mere specimens of vegetable metamorphoses brought about by transplanting, acclimating, crossings, and culture.

The peach tree usually does not attain a large size, but in soils and climates well adapted to its growth, its dimensions are considerable, and it has a somewhat spreading form. In rather cold climates, the branches become elongated and scattering, in consequence of the new and tender wood of the suckers and twigs being annually killed by the frost or cold of the winters, thereby throwing an undue portion of the sap into the leading branches; which renders the shortening-in system of pruning particularly applicable to such latitudes, which forces the tree to fill up with numerous branches of young wood; and, which lessens the leverage of the long horizontal limbs, and prevents their breaking off with the weight of the fruit. The leaves are narrow, smooth, and separated. The blossoms are of a very gay and beautiful pink color—some are double, and some much larger than others.

The peach is rather more tender and not so long lived as the most of fruits raised in temperate climates, but it is a rapid grower, and commences to bear fruit usually the third year from planting the seed. In the Northern States, the trees often decay after bearing two or three good crops, and sometimes the first good crop is the last; but this early decay of the tree is not applicable to the Middle or Western States; and, in the more Southern climates it frequently attains the age of thirty or forty years—and is never attacked by the disease called the *yellows*.

The fruit of the peach tree is various as to size, according to the care in cultivation and the health of the tree; ranging from the size of hulled walnuts to that of the largest apples; specimens often measuring from twelve to thirteen inches in circumference. It is not so distinctly marked as some other fruits. There is a good deal of sameness in the general appearance, size, form and color. The variation is caused by the climate, culture and soil. Some are of a waxy white, with a beautiful blush; some of a light wax color; others nearly red in the sun, while some have a dark gray, or dark blood red appearance; and all varieties are covered with a soft downy substance pervading the entire surface of the fruit.

Some varieties have the flesh cling firmly to the seed; while others open freely and separate the flesh from the seed perfectly. There are a few others which neither cling perfectly nor separate easily. There is also considerable variation in the quality of this fine fruit on the same tree; that being best which is most exposed to the sun and air. These are some of the peculiarities of this juicy, luscious and most delicious fruit.

USES OF THE FRUIT.

The peach, as it regards its melting lusciousness of taste and beauty of appearance, excels all the fruits of the earth. It has been aptly said that "no fruit this side of Paradise" can successfully rival the blushing cheek and nectared juices of some of our fine varieties. Its delicious, refreshing pulp is always in demand when uncooked, or, when cooked, it affords the most elegant and wholesome culinary material and delicious dessert dishes.

The fruit, when perfectly ripened on the tree, and eaten when fresh and plump, is very nourishing, and can be indulged in with impunity, almost to repletion, without disagreeable results. It is nourishing, diuretic, slightly laxative, and has other delicate and fine medicinal qualities. In pies, it is especially fine, superb—nothing of the sort can be better. Raw peaches, with a little crushed sugar, are not to be despised—maple sugar, peaches, and cream is a dessert for the gods.

Though somewhat transient in their fresh state, peaches may be carried in ice to distant parts of the world in a fine, sound condition—and, when dried, they can be kept in any climate, and carried to any distance. In locations distant from market, they may be converted into the finest brandy for medicinal and other purposes; and where they cannot be put early into the market, they may be largely cultivated for the purpose of drying, and sent to market whenever desired. Dried peaches are now (April, 1870,) selling at Richmond at 13 to 15 cents per pound, peeled; unpeeled, from 7 to 9 cents. At Norfolk, peeled, 15 to 17; unpeeled, 10 to 12 cents. Lynchburg, peeled, 12 to 14 cents; unpeeled, 8 to

10 cents. Alexandria, peeled, 13 to 15; unpeeled, 10 to 12 cents. Last Winter they commanded more than double these prices in all the cities.

The drying of peaches in the far South is effected by spreading the fruit on boards, or frames filled up with boards, and exposed to the sun and air; but where the business is done on a larger scale, for market, a *drying-house* is constructed, which is heated by a stove and furnished with ventilated drawers, a description of which has already been given in the course of this work. These drawers are provided with bottoms made of laths or narrow strips, just open enough to allow the heated air to circulate freely through them. They are filled with free stone peaches, in halves, taken before too ripe. If they are to be dried unpeeled, they are first dipped in boiling hot water for a few minutes, they are then cut in two, the stone taken out, and the two halves distributed in single layers, touching each other, with the skin downward. When the drying is completed by the heat of the drying-house, which requires but a short time, the drawers are taken out and a fresh layer put on.

The leaves of the peach when bruised and mixed with water, or bruised in water, and distilled, is a preparation called *peach water*, which is much used as a delicate flavoring extract for culinary purposes. If steeped in brandy or other spirits, they communicate a grateful flavor called "*Noyean*." An imitation of the celebrated improved Noyean is made by using the best white brandy, which, after being flavored with this extract, is sweetened with refined sugar mixed with a small portion of sweet milk, and then decanted.

The refuse of the peach orchard and distillery are used in fattening hogs—for this purpose it is considered wholesome and valuable food.

Peaches put up in brandy are considered a luxury, and the *canning* of this fruit in a ripe state, fresh from the trees in air-tight vessels, has become quite a large and profitable business in many parts of the United States.

An eminent Northern pomologist says; "No man who lives under a warm sun will hesitate about giving a due share of

his garden to peaches, if he has no orchard; and even he who lives north of the best Indian corn limits ought to venture on a small line of espalier for the sake of the peach."

PROPAGATION OF THE PEACH.

This fruit is, perhaps, more easily propagated than any of our cultivated fruits. The stone or seed may be planted any time in the Fall. They will come up, however, much sooner in the Spring, and without further trouble, if planted as soon as the flesh is off—before they become dry. If they are allowed to get dry, they can still be planted in thick layers or beds, and covered three or four inches with rich mould, and in the following Spring, when the ground becomes warm and dry enough to work, they may be taken up and carefully cracked, so as not to mash or injure the kernels. These kernels can now be distributed in nursery rows in rich, light, well prepared soil. Place them about one inch deep, or as deep as you plant Indian corn, and twelve inches apart in the rows. The nursery rows should be four or five feet apart, and the rows had best run in a direction that will secure the most warmth from the sun. If the stones of the peach are planted as soon as the flesh is off, they will vegetate the next Spring, and, in rich, mellow soil, will grow from three to four feet in height by the Fall; and may be budded in August or September. This is an operation that should be carefully performed. *Grafting* the peach is seldom attempted, as success in this way is always uncertain. The buds should be put in as near the ground as possible. The next year, during the month of March, the young trees should be headed back; that is, carefully cut off just above the bud, and the trees will, from these buds, in a good soil, attain the height of five or six feet the first year—and this is far the best size for transplanting, viz: one year from the bud. In northern climates the plum stock is preferred to the peach for the purpose of propagation, especially for the finer sorts; and it is more suitable for walls and protected places.

We believe, however, that free-growing, healthy peach stocks

are the most suitable and natural foundation for the growth of all standard orchard peach trees.

In planting the stones to raise from, great care should be taken to select the largest and soundest, from vigorous thrifty trees, and not put in those of a different character—as such discrimination will be a great advantage to the growth, and also protection from worms and diseases, especially *the yellows*, where that disease is prevalent.

Dwarf trees are made such by budding in the *Marabelle* plum stock, or some other slow growing variety of plum. Some employ the almond stock, but not for dwarfing.

In raising seedling kinds, the stones should be grown in the South for Southern culture, and in the North for Northern culture. The peach is so easily propagated by seeds, and seedling varieties are often so very good, we are inclined to recommend a portion of the orchard or garden to be devoted *exclusively* to them. A good author advises the orchardist (and we entirely concur with him) to select *fixed varieties*, which, if cultivated at a proper distance from other trees, so as not to mix in the blossom, will invariably produce the same from the seed. The peach is propagated in this way with much less trouble, and, we *know the trees to be much more hardy and durable*; especially if the seeds or stones are planted and allowed to grow just where the tree is to stand in the orchard—by this means you save nearly a year's growth of the tree. With proper cultivation* and attention a complete assortment of fine peaches may be obtained, with quality as good, and *far more durable* than the best budded varieties.†

We have among our fine peaches several fixed varieties, and others might be proven to be such, by planting a few of their stones apart from other varieties, and when they come

* The young plants must be carefully weeded during the Summer, and if the seed and management have both been good, they will grow to the height of three or four feet by the Fall.

† Budded trees are more tender than seedlings. Something is due to the difference in varieties, but there is more due to the budding. In the budded trees, the sap does not find its way from branch to root so readily as in the seedlings, and the consequence is, that the fruit-bud on the former has a larger growth, is not so compactly done up, and consequently cannot so well stand the action of frost. Should any one be skeptical with regard to this position, as to the effects of the cicatrix, let him dissect carefully a few young trees at the point where the bud or graft is inserted.

into bearing, if they all be precisely the same, it may be regarded as a fixed variety. Try several varieties in this way, and those that come nearest to the sameness required should be adapted as *fixed standard varieties*. In this way a splendid assortment might be obtained with no expense and but little trouble.

SUITABLE SOILS AND SITUATIONS.

It is conceded that the very best soil for the peach is a deep, rich, sandy loam, or any strong mellow loam. Mellow loam, containing but little sand has been found to produce fruit of the finest quality, and for a long time successively; a light, thin, sandy soil will produce fine fruit, but the trees on such soils are not long-lived. The worst and poorest soils for the peach are compact clay, containing little vegetable matter. The rich, friable, red soils of the Piedmont sections of the South are unsurpassed in their adaptability to the perfection and lusciousness of this fruit, and the finest of all specimens are grown in this region, not only as it regards flavor, but also size and beauty.

As a general thing, the peach will flourish in any moderately rich, friable soil, with suitable culture. Some authors esteem as best, a light and rather dry loam. On lands rather light and sandy, *swamp muck* or *ditch mud* mixed with stable manure is a highly beneficial corrective. On soils of a contrary character, sand, saw dust, leaves, &c., will aid greatly in the pulverization and productiveness of such land.

SITUATION.—In regions of country that are subject to vernal frosts, situation or aspect is of considerable importance, as the blossoms are liable to be cut off when in the half open or full blown state; and they are sometimes killed in the bud by the rigor of severe winters. This has happened to some extent in Virginia during the last winter, 1869–70. The fruit buds were not sufficiently matured up to November, during which month we had the coldest spell ever known at the approach of our usual winter—affording an opportunity to get ice. Then we had a remarkably warm winter up to

the 20th of February. On the 22d there was plenty of ice to put away, and the weather very cold. At this time the peach buds were very much swollen, and the most forward were killed by the freezing and bursting of their cells.

Those who have to plant peach orchards in such frosty districts will find great advantage in making plantations on the north sides of hills, northern slopes and elevated grounds. They should be preferred to warm valleys and southern aspects, as in the cooler positions and aspects the vegetation is retarded, and may escape injury. The vicinity of large rivers and lakes, in the interior of the country, are also exempt from the effect of frosts and are generally finely adapted to fruit culture.

It is not uncommon that the peach crop is partially or entirely destroyed in valleys and warm locations, whilst on the neighboring elevations fine and full crops are produced. It is said, on a frosty night in Fall or Spring, the thermometer indicates five or six degrees lower on bottom or valley lands, especially if they are narrow and deep, than on the hills adjacent. This difference, with regard to temperature, often causes, in such situations, a total failure of fruit. Those who are compelled to put their trees in such situations should plant those varieties that have the habit of late blooming. They should also select the *fixed varieties*,* such as produce the same from the seed; grafted fruit is always the most tender; such seedlings should be planted in the places in which they are to stand, as *transplanted trees are more or less tender*. They should be kept in a vigorous state—the worm at the root should be attended to, and the long limbs cut back, and the cultivation by no means neglected. Such trees will bear much frost and cold without injury. This treatment will cost no more than that practiced on trees in more favored positions.

Perhaps a safer plan to secure regular crops in situations unusually frosty, is to procure nursery trees from the States far South—say from Georgia.† The young trees from that

*Such as the Columbia, Heath Cling, Tufts Rareripec, Hale's Melocoton.

†Middle Georgia.

State will bloom at least *ten or twelve days later* in Virginia or Maryland than trees of the same variety that are natives of New Jersey or New York, when placed in the same orchard; and, by late blooming, will generally escape the late frosts in the Spring. This is a very important fact—and the benefit to be derived from this knowledge is not confined to those situations that are especially frosty.

PREPARATION OF THE SOIL AND PLANTING THE TREES.

If the natural drainage is not sufficient to carry off the surplus water and moisture, it should be effected by artificial means—such as surface draining, by bedding the soil, by open and by secret or subterranean ditches. The soil should be deeply broken by first using a two or three horse plow, followed by a sub-soil plow as deep as possible. The ground should be well harrowed down. The plowing had best be done parallel with the ditches, or, if the descent is very gradual, and no ditches, up and down the grade, so as to aid in the drainage. The rows for the trees may now be laid off with the plow each way at the distance apart desired for the trees, stakes having first been set as guides for the plowman, who must have good command over his team. When the ground is thus checked off, the places may be easily prepared with the mattock and spade; and the *notched board* may be used to designate the exact spot for the tree. The planting of the peach is generally performed in the same manner as that already described for the apple tree, the process being substantially the same. *Extremely rich soil*, however, is rather detrimental for the growth of this splendid fruit, as the trees will require much pruning, and the fruit will ripen badly and be subject to the rot.

As to the distance each tree should stand apart—about twenty feet each way, where the land is to be cultivated and the trees expected to grow large, will be about right; or, twenty-one feet each way, which is 100 trees to the acre. When the trees are to be *shortened-in*, or trained in somewhat

a conical or pyramidal form, fifteen feet may be sufficient for regular orchards. Where it is desired to take the wagon through the orchard, to carry the fruit away, twenty-four feet distance to every fifth row, one way, will afford sufficient space. In apple orchards, with trees thirty or thirty-three feet, a row of peach trees between may be grown with advantage.

Proper Location.—The Rev. C. W. Westbrook, an eminent pomologist of North Carolina, says: “The peach does not require the richest, nor will it succeed on the poorest soils, unless a good supply of vegetable matter be used, *not only in planting*, but subsequently as a top-dressing. In planting a peach orchard, I would select, as a general rule, high ground of moderate fertility, capable of producing a moderate crop of grain.”

“I would not be careful to select a northern, southern, eastern, or western exposure in particular, but would prefer to plant, if possible, on opposite ground at the same time. For example—one of my neighbors owned a high hill which sloped north and south. He had peach orchards on both sides of the hill. I have seen the orchard on the north side burdened with fruit; while on the south side the frost had completely destroyed the crop—and *vice versa*. The same may be said of eastern and western exposures.*

“It is doubtless quite as advantageous to plant on different locations, and thereby render a crop in either one of the orchards almost certain annually. Peach trees will thrive, with proper care, in either red, gray, or sandy soils.”

WHEN TO PLANT.—The same Southern writer says (and we are of the same opinion): “There seems to be various differences of opinion in regard to the most suitable season for transplanting peach trees. I am satisfied that the Fall is the proper time. My reasons are obvious: In the first place, the peach tree, to do well, and come early into bearing, in addi-

*The author agrees with Mr. Westbrook in this—having experienced the effects of the vicissitudes of the Winter in different locations and exposures; and, he has to remark in the same connection, that his orchards on the hills are at this time (May the 1st) laden with young fruit, whilst those in the valley have none, or but a scattering crop. This was occasioned by the cold of the 22d and 23d of February, 1870.

tion to thorough cultivation, and thorough pruning, must be transplanted in a dormant state, or, after the leaves have fallen, the sap ceased flowing, and the roots well matured; and before young rootlets begin to grow, or the buds begin to swell. November and December constitute the season to which I allude. By the 10th of November, in this latitude, the sap is perfectly dormant. Usually, the month of January is too cold, and the ground too much frozen for transplanting. In February the sap begins to rise, and the roots begin to grow, and the buds begin to swell." At the North, Spring is preferred, especially for stiff clayey soils. The peach tree, however, will thrive, if properly planted, from the first of November to the time the fruit buds begin to show the red.

When it is necessary to use manures in the preparation of the soil for transplanting, *wood ashes* should not be omitted, as the peach tree contains much potash. The soil into which the trees are to be set should be fertilized also with scrapings from the woods and fence corners—well pulverized swamp muck is very beneficial. Trees planted in the Spring should always be mulched.

One of the causes of peach trees dying while young is the planting, transplanting, and pruning the *same stock*, which causes the stock to be 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 in search after these insects for their support, with their sharp bills, wound the stock in many places; from which wounds the sap of the tree is drawn out, which congeals, and seldom fails to kill, or to render the tree useless, in a few years. To prevent this, transplant the trees, as young as possible, where you mean them to stand—by so doing, you save nearly all the roots. If the kernel is planted where the tree is intended to stand there will be *no check in growth*, which is always injurious to peach trees. But as trees already budded are generally procured from the nurseries, it is well, in order to secure good roots, to purchase those, only one year from the bud. Such young trees need no staking, and, if properly planted, will grow erect and vigorous, and will outstrip those planted at

the same time of larger size. Where rocks can be conveniently obtained, it is well to place two or three flat ones about the roots. With such protection the trees will stand a hurricane.

If the kernels are planted where they are intended to remain, which is always best, the soil should be in fine condition, and they will grow large enough to bud by the next season; and that portion which are *fixed varieties*, and do not require budding, will remain and grow off without any disturbance. Transplanting, as has already been recommended, should be done in the Fall, as soon as the leaves are off; or, *very early* in the Spring. In close, clayey soils, Spring planting is considered best; but it should be done early, before the buds start, unless unavoidable circumstances prevent. The later it is done, the more careful should be the preparation of the soil.

Some Winters give favorable opportunities for planting during that season, and it is all the better if a little trash or mulching be thrown around the stem, at the roots, to prevent freezing out and injury from frost. In budding, select buds having three leaves or buds, and next to these two, preferring the buds at or near the middle of the scion.

Those who wish to plant a nursery of peach stones (which should be selected from the largest and most perfect fruits), should have their ground light and mellow. Plant in drills about four feet apart and one foot apart in the rows. When from three to five inches high, they can be removed with the transplanting trowel or mattock, with as much soil adhering as may be convenient. Some let them remain two years; but with a suitable soil and good culture, the peach is large enough for budding the first year, and for transplanting the second; it is not desirable to have larger trees, and the younger they are placed where they are to remain the better, as such trees will grow off more freely and become more healthy and vigorous than trees transplanted at the same time of much larger size.

Mr. Westbrook directs peach trees to be planted in the following manner: "In small orchards, I use stakes, set, one for every tree to be planted, and in perfectly straight lines either

way. If the soil be thin, I drop a few shovels full of rich earth from the woods or fence corners at every stake. The planting, then, is easily done.

“The soil having been previously well broken, I dig a hole large enough to receive, in their *natural* position, all the roots; the stake being left standing. Then cut off with a sharp knife about one third of the branches of the tree; or, in other words, reduce the top about one third; also, by an under cut, any bruised or mutilated portions of the roots (Mr. W., we suppose, refers to trees two or three years old), leaving all the sound, healthy roots and fibres. Then take up the stake and plant the tree exactly where the stake stood, and just as deep, and no deeper, than it grew in the nursery, spreading out the roots naturally. Then sift or scatter the fine soil gently on the roots, until all the interstices are well filled by working it in among the fibres with the fingers, while the earth is thrown in, and then, as rapidly as you please, up to the collar of the tree (which is the place a little above where the roots are emitted from the lower extremity of the trunk—usually about two inches, and of a yellowish color), and then press the earth gently with the feet all around the stem and over the roots. The planting done, it is best to throw some kind of coarse litter, such as can be most easily obtained, around the trees, covering the surface five or six inches, to protect the roots in dry weather. When trees are planted in the Fall, I deem it altogether unnecessary to use the litter.”

CULTIVATION.

It is well known to the cultivators of this delightful fruit, that it requires careful cultivation in order to insure the perfection of both tree and fruit that is always desirable, and which is by this means so easily attained. Nothing that grows out of the earth will pay better for the care bestowed, or will shew good treatment sooner than the peach tree. Although it cannot be denied, that in favorable climates, and in good soils, trees promiscuously growing about farms will, for a few years, bear fruit of fine flavor—yet such fruit will not be

large, and the trees will last only a few years in consequence of the worm at the root.

Without attention, the peach is always a failure; at least to a great extent. This accounts for the discouragement which attends the raising of this delicious fruit in many places. It is tender, and needs care in its management; yet very little skill or science is required in attaining for it high perfection both in fruit and tree. The difficulties generally complained of originate in *northern climates*. The South is the original home of the peach, and we have only the *curculio* and the *borer* to contend with, as a general thing. Every person who attempts peach culture should resolve to bestow the time necessary to keep out the grass—to give a little manure now and then—and to keep the soil beneath the trees in a fine pulverized condition. Do this, and attend to the directions in this work for the destruction of the insects just named, and the most satisfactory results will certainly reward the light labor bestowed.

It will be a pleasant recreation for the farmer in his walks, during the fine days of Spring, to view the beautiful blooming of his trees—their progressive, teeming luxuriance—and afterwards to witness the increasing size, development and beauty of the fruit; whilst, at the same time, he pinches off a useless or exuberant twig or bud here and there—or sees a little gum exuding from the crown of the roots of the young trees, indicating the presence and work of the borer, and with his pocket-knife follows him up, and decapitates the little ravenous sap-sucker.

Although the peach tree is so easily raised, yet there is considerable diversity of opinion among authors and gardeners as to the proper cultivation and training of this unrivaled fruit. There is disparity of opinion between Northern and Southern orchardists. Those of the South, for light sandy soils, recommend shallow plowing and tillage; while those at the North plow deeper, and work the soil more thoroughly. Perhaps both are right—for, in the light, thin, sandy soils, the roots are forced to run shallow in search of food, and the plowing, if not carefully done tears and bruises the roots to

a serious extent. On the other hand, trees grown in deeply prepared, loamy soils run deep, and beyond the reach of the plow in cultivation. The farmer must, therefore, use some judgment in this matter, and vary his practice according to the depth and nature of his soil. (Perhaps the best tool with which to work immediately under the trees is a good *garden fork*; and, in no case, allow the plow to pass right under the trees.)

The cultivator of light sandy soils enriches the ground by mulching, and top dressing with manure, and leaves it in a state of rest. This treatment is no doubt the best for such soils. In deep, loamy soils, the ground having been deeply plowed or spaded before planting, the roots naturally run deep, and admit the cultivation, by plowing or other tillage, with great benefit. In all heavy, clayey soils, the ground should be kept constantly mellow and loose. No grass or weeds should be allowed to grow near the trees to rob them of their food.* Root crops, peas, and any low, hoed crops may be permitted between the rows for two or three years, but nothing should be grown just under the trees. After the third or fourth year, no crops should be raised in the peach orchard, but the whole surface should be cultivated for the exclusive benefit of the trees.

In regard to the poverty or fertility of soils intended for peach culture, there is some disparity of opinion; but it is generally conceded that a medium soil is to be preferred. The poorer soils produce the finer flavored fruit, but the quantity is less, and the trees suffer for want of food—insects take advantage of this feeble state of the tree, and are especially injurious to it and its fruit. Peach trees on very rich soils grow faster and larger, look greener, and are thicker in the boughs, and cause a thicker shade; yet on them will grow but very little fruit, and that little will be ill-tasted, greenish, even when seemingly ripe, and of a bad kind. A middling fertility should, therefore, be preferred, as producing vigorous

* The cultivation of the peach and apple, especially of the former, should be continued later than that of corn or potatoes. It should be continued as long as weeds will grow.

and healthy trees, bountiful crops, and fruit of fine size and quality.

In deep, loose soils, the roots of the peach tree penetrate to a considerable depth. Instead of losing by being opened and exposed to the frosts and air, the stiff clayey soil gains greatly in value by the very act of rendering it more friable, while at the same time it has naturally sufficient heart to bear a cropping with peas or roots with advantage rather than injury to the trees. The health, growth, and vigor of an orchard in moderately strong land, kept under cultivation, is surprisingly greater than if allowed to remain in sod. The farmer will see that the difference in treatment, or cultivation, therefore, should always adapt itself to the *nature of the soil*.

Trees that have been grown and cultivated for a length of time, and not manured, unless the land is naturally strong, are like an animal tied to a post with a limited range of pasture. In both cases it is indispensable that food be carried to them or they will starve.

The crops injurious to the peach tree are those that ripen their seeds—such as Indian corn, and all small grains. Clover, and all the grasses, are decidedly injurious. Potatoes, and all root crops may be cultivated with advantage, for a time, among the trees—squashes, pumpkins, and vines generally, may be allowed. Pasturing orchards with small animals, when the trees are three or four years old, by turning in hogs, calves, sheep and poultry, will have a good effect in destroying insects, as the animals consume the wormy and faulty fruit as it falls. Sometimes hogs will strip the bark from the roots of peach trees. We had a few valuable trees injured in this way some years ago. The hogs are the MOST SERVICEABLE IN THE ORCHARD, BUT THEY MUST BE WATCHED. While on this subject, it may not be amiss to say something about enclosures. If you have a mind to get your orchard *effectually pruned*, omit this little matter, and your cattle will perform the job in much less time than you could do it yourself. Their avidity and energy are surprising, as they will leave clover up to their eyes to browse on the luxuriant branches of your val-

uable and favorite trees, remorselessly tearing them limb and branch, and all your labor is lost.

ENCLOSURES.

A cheap fence can be made of posts and rails in this way: Set your posts eight to ten feet apart—they may be six feet above the ground. Mortise, or bore holes with a two inch augur for three rails, divided properly, so that the fence will be five feet high, and let them in the posts. The holes in the ground, for the posts, should be about eighteen inches deep. This fence will be fully sufficient to keep out cattle, and any coarse workman can make it.

Another simple and cheap fence for this purpose is made as follows: A stake and cap line is made the usual way. The stakes well driven, or put in the ground. Have the usual crook for a stake and cap fence. Prepare short stakes; drive them in the ground between the long stakes—that is, between each pair of long stakes—so that, when well driven, about two and a half feet of them will remain above ground. Now place three or four courses of rails between each pair of long stakes with their ends resting on the top of the short stakes. This will make a substantial fence four and a half or five feet high, sufficient to keep out all large stock, and suitable for any orchard and for other purposes.

MANURES.

When the soil around peach trees requires manure, which it very often does, there is nothing better than *wood ashes*, leached or unleached, and all vegetable manures are proper for this fruit.

Well-rotted chip manure and ashes, or, a light dressing of lime with the litter, is very beneficial. Muck or ditch mud, when a Winter's frost has ameliorated it, mixed with animal or vegetable manures, is an excellent compost, especially if the soil be light, sandy, or slaty. Soap-suds, chamber-slops, &c., are good; and their action, like that of ashes, is immediate and certain.

For the renovation of old orchards, peach or apple, these manures act like a charm, and no farmer who has old dilapidated trees can afford to neglect their culture, pruning, and painting the wounds, and the application of some of these life-renewing and nourishing stimulants. The result in subsequent crops would hardly be credited.

TRAINING AND PRUNING.

The pruning and training of the peach tree at the South, especially at the far South, is practiced for a different purpose from that practiced when we approach the limits of peach culture at the North. The peach tree at the South, if allowed to take its natural shape and growth, bears fruit in the third or fourth year from planting, and usually has a well-shaped, rather spreading, round head; full of small bearing branches and twigs well furnished with leaves and buds—the fruit always produced on the last year's growth. The only pruning here should be to *shorten-in* from one half to one third of the last year's growth to prevent over-bearing—and allowing the trees to branch as low as is sufficient to protect their stems from the scorching rays of the sun, aided by the compact heads that this manner of pruning produces—the heat and exposure to the sun still being sufficient here to give color and flavor to the fruit. Trees grown at the North, if left to take *the shape that is forced upon them*, shoot up their branches in



the air, and stretch them irregularly around to an extent out of all proportion. *This is on account of climate.* The small limbs, shoots and twigs being always killed out during their

Winters;* leaving only the large, bare, and rigid limbs with vitality sufficient to produce buds and leaves, and all the sap and growth are employed and forced to the ends of these lean branches, causing their unnatural elongation. (See cut.)

Hence the necessity of keeping these long branches constantly *cut back*, or never allowed to straggle off; and if they should bear fruit, the leverage would generally split them off the stem and ruin the trees; so, that the shortening system is a *necessary restraint* in both the North and South; but it is practiced (in part) for different purposes. In the former case, it is to screen the stem and interior of the tree from the scorching and blistering effects of the sun, and to increase the size and quality of the fruit by reducing the quantity; while at the North, it is done to increase the number and promote the growth of short branches, and throw more vigor into the small shoots and twigs about the stem and body of the tree, so as to keep them in a healthy, vigorous condition, to stand the cold of the Winters, and to induce fruitfulness and superiority of fruit.

Northern writers and cultivators of this valuable fruit do not seem to know why they are *compelled* to take this cutting back and shortening-in course; but erroneously suppose they are correcting the habit of the tree—forgetting that the peach is a native of warm climates, and that it is naturally a round, bushy, compact headed tree. In other words the rounded shape of the head of the tree at the North is the result of art, while at the South, it is the work of nature.

The early cultivators of this fruit in the United States, or in the Middle States, seem to have been of the opinion that the tree required but little, if any, pruning, training, or culture; and this opinion might have been strengthened by the fact that the Winters, if not more mild, were prevented from damaging the trees and the fruit by the protection afforded by the tall forests that surrounded the small clearings of that period. The curculio, the borer, and the disease called *Yellows* were entirely unknown—and the crops were raised in such abundance, without care or special culture, as to be fed

*This is sometimes the case in some parts of Virginia.

to the hogs. As the country became open, the cold, blighting winds increased in force; the insects began their work of devastation, and diseases before unknown were developed more or less fatal: and the resistance of the trees to all these enemies became more feeble as the fresh soil grew thin by repeated injudicious cropping, and deprived of potash and all the requisites that sustain the healthy growth and longevity of the tree. The growing of grain crops was especially injurious—and the peach crop declined. The production became uncertain, and many cultivators, from these causes, and from their negligence of proper tillage, gradually gave up the cultivation in many places. The same in many respects may be said of apple culture. We hope, however, the “*golden age*” of *fruit culture* is about to be revived, and that with proper tillage, skill, and attention, this pleasing and profitable branch of horticulture will attain the success and development it deserves, and such as modern science, and energy, and an enlightened view of the importance of the subject demand.

What is generally termed the *shortening-in* system, if regularly attended to in the early Spring or Winter, will enable the peach tree to continue in full vigor and production in almost any good soil for from twenty to thirty years. Observe a healthy young tree in the garden or orchard, the first blooming year. It is usually from six to eight feet in height, and, in the South, the head is well shaped, branching off about two or three feet from the ground. (We think low heads are best on many accounts; they shade the stem and roots, and are more convenient for pruning and gathering.) The tree, perhaps, has never been pruned, or only slightly, to regulate its shape, and this is no disadvantage. In the latter part of the Winter, or very early in Spring, the pruning may be done. This is a very simple and easy operation, and consists only of *shortening-in*, or cutting off one third or *half the last season's growth* over the whole outside head of the tree, and also of some of the inside branches. The usual annual growth will probably average from one to one and a half or two feet, and this trimming will take off from six to twelve inches. No *exact* length is required—and it is well to shorten back the strongest shoots

most, in order to favor the growth of the shorter ones. The longest limbs, that destroy the balance of the tree, should be cut back, in order to restore the equilibrium and uniformity of the head. By pursuing this course, the tree is brought to a well rounded shape, and all danger of the limbs splitting off with the weight of fruit is obviated. By reducing the wood of the last year's growth, say to one half, it must be recollected we reduce the *next year's crop to one half*, for we thus take off the bearing twigs. The remaining half will now receive all the sustenance of the tree, and the fruit will be double in size. As the season advances, the young shoots put out from every part of the tree, and keep it well furnished with healthy, vigorous bearing wood for the growth of the next crop. The size and luxuriance of the leaves aid in producing larger and finer flavored fruit. It is the practice of some gardeners to shorten back close above a *wood bud* rather than a blossom bud, which is an advantage to the foliage as well as the fruit. The size and beauty of the fruit is much promoted by the size and vigor of the leaves. Fruit buds may be known, as has been noticed in another part of this work, by the spherical form they assume. The leaf buds being pointed and rather sharp.

This system of pruning must be a regular business, every year, as long as the tree lasts. It is done much more expeditiously than most persons are aware. The wounded parts, being small, need no plaster or painting, and it is generally done when the farmer is not busy.

The appearance of a tree, or an orchard, pruned in this way, even after bearing many successive crops, is a very great and notable contrast to that of the skeleton shapes that have not been favored with this regulating treatment. Some people are very cautious, and discredit the benefits of this shortening-in mode, as applied to the peach tree; but they should mark the difference between a beautifully rounded, low-headed, healthy young tree, laden with large, beautiful fruit, and luxuriant green foliage, while the tree not so treated is of a character so different, as is exhibited by the wood cuts above represented; no one should, or can, doubt the advantages of so

simple a course of treatment to secure results so valuable, which they can see with half an eye. All intelligent orchardists recommend it with entire confidence to every man who plants a peach orchard or cultivates this splendid fruit.

The *training* of the peach tree, as practiced in France or England, against walls or by espaliers, is of but little use in this country, except, perhaps, in some Northern latitudes. It is a little practiced in the vicinity of Boston, and some towns north of that place; and, it may answer very well for standard trees. In many parts of New England crops may be grown in this way. Directions for training, as adapted to this fruit, may be found in another part of this book. (See page .) For small gardens, and for ornamental purposes, at the South and West, it may be recommended; but in ordinary culture it would be attended with loss.

Early Bearing.—In order to hasten or induce early bearing, where trees are very luxuriant and expend their energies in growth, it is recommended to clip off the extremity of the branches in the *early part of July*—say about one third of the new growth; by this means, blossom buds will be produced, the latter part of the Summer, for the next crop. This has been found to be very successful, and is recommended by several good authors.

A Good Wash for the Peach Tree.—Take about a gallon of unslacked lime, two quarts of soot, a quart of soft soap, and one pound of sulphur. Pour on this warm water, until the whole is of a creamy consistency, or of the consistency of oil paint. It is applied to the stem and large limbs of the trees with a painter's brush, sponge or cloth. It should be laid on as hot as you can bear the hand in it, and it should be put on in the Spring and again during the Summer. This will promote growth and health, increase the vigor of the trees, and is excellent for the destruction of insects injurious to both tree and fruit.

DISEASES—THE YELLOWS AND CURLED LEAF.

The Yellows is a most fatal disease, supposed to be constitutional with the peach tree. Its ravages, however, as far as

the author's knowledge extends, seem to be confined at the present time to the Northern and Eastern States, and some portions of the West—the fine peach growing sections of the South and Southwest being nearly exempt from this formidable malady. It belongs exclusively to this country, and originated below Philadelphia about the first of the present century. For near an hundred years after the tree was introduced into this country from Europe, it was cultivated (or rather planted) in Virginia, Maryland and New Jersey, and was, during all that time entirely free from all diseases, and the fruit was raised in the greatest abundance with but little culture or care, and was propagated principally from seeds. The fresh and rich virgin soils of those States, at this period, being eminently adapted to its growth and perfection. Most of these soils, however, were light and sandy, and the cultivation of cereal crops was continuous and exhaustive, and in a majority of cases, without the least attention to the improvement of the soil, or rotation of crops, or, even an effort to sustain the fertility of the soil. Previous to this time, the peach tree, which was mostly allowed to have the exclusive benefit of the soil on which it stood became, by constant and close culture of other crops, in a manner starved out. The trees became enfeebled—the seeds imperfect—producing more weakly trees from generation to generation, until at last, about the year 1814, this destructive disease became so prevalent as to destroy whole orchards in the neighborhood of Philadelphia and surrounding country.

The disease was first noticed about the year 1800. The tree, when in good condition, always productive to excess, began to decline. The impoverished soil was no longer able to sustain healthy growth; the energies of the tree fast declined, and it became every year more enfeebled and subject to disease and decay. The progress of the disease was now constant and speedy wherever it had been cultivated in the Northern States, induced, it is supposed, by the farmers taking up the idea that the fruit south of them was the best; procuring imperfect and diseased seeds from the Philadelphia and other markets tainted with the disease. Northwestward, to

some extent, by the same means it has been disseminated—but the rich alluvial soils of that region, has, in a manner, limited its progress.

Poor, sandy soil, poor cultivation, and overbearing originated the Yellows, and in order to succeed in the culture of this fruit, these evils must be remedied. It is particularly important, for cultivators in northern latitudes, in order to overcome this and other difficulties attending an uncongenial climate, that they should, by careful pruning and culture, and training where that is necessary, secure their orchards from the destructive effects of this disease.

Indications of the Yellows, by slight observers, has been confounded with the appearance of the tree produced by the *borer*, as in both cases the decline of the tree and the color of the foliage is very similar; also the premature ripening of the fruit is common in either case. It is not uncommon for the trees to be attacked by both the disease and the insect, and the decline of the tree is at once rapid and beyond remedy.

SYMPTOMS.—The Yellows is considered a *constitutional taint*, and all intelligent orchardists consider it *contagious*, and in accordance with this view, destroy root and branch of all suspected trees. The following symptoms of infection are almost infallible.

1. The growth of shoots or twigs on the branches are slender, wiry and almost sapless. The leaves small, thin and narrow; very different from healthy foliage. The color of the leaves are either pale yellow or destitute of color. The shoots are no longer grown on the extremities of the boughs, but are protruded from the latent buds on the large branches and on the principal portions of the stem.

2. The premature ripening of the fruit which occurs from two to three weeks in advance of the proper season. The first year of the disease, the fruit grows to nearly its natural size; but ripens sooner than usual; the following season, it does not attain half that size—or even a fourth of the usual size, and the color is variable, with specks and large spots of dark or purplished red. Internally the flesh is deeply colored, much more than a natural or healthy state, and it is more so just around the stone.

It is established beyond a doubt that the Yellows is propagated by budding or grafting—that the stock, whether peach or almond, is sure to become infected, and is lost—and, that the seeds of diseased trees produce young trees in which the Yellows invariably break out.* Even stones from healthy districts, when grown in infected regions, produce young trees that soon fall a prey to this disease. The same happens also when the peach is budded on the plum or apricot.

REMEDY for the Yellows. It is confidently believed that with proper attention and care this very formidable malady may be easily remedied. The process is as follows :

1. We should exterminate *every tree*, both root and branch, that has the Yellows. No other tree should be planted in the same place for several years thereafter, unless a thorough removal of the soil is effected.

2. Great care should be taken to obtain stones for planting from perfectly healthy trees ; or, buds that are known to be healthy. Nurserymen and farmers in districts liable to the Yellows should use the utmost care to procure from places known to be entirely exempt from the disease.

3. To use every effort to preserve the trees in a vigorous and healthy state ; and, in doing this we should, *from the first bearing year, practice the shortening-in system of pruning*, which we have already described. It will certainly secure the trees from over-bearing and all its disastrous consequences, and preserve them in proper vigor, health, and productiveness for many years. In a word, it will certainly and effectually prevent the Yellows where it does not already exist in the tree, and improve the size and quality of the fruit to an extent almost incredible.

Independent of the Yellows, says a writer in a standard work on pomology, “The effect of shortening the shoots of the peach is not merely to throw more sap and juice into the fruit, but to add vigor and health to the tree generally, by

*The yellow variety of the peach are much more liable to this disease than any others. It is well known that they produce the heaviest crops, and are liable to *over-bear*, which greatly reduces their vigor—and the greatest number of victims are always to be found among the yellow-fleshed peaches.

increasing the power of the roots relatively to the branches.* The peach being a short-lived tree, it has been justly remarked, were it allowed to expend all its accumulated sap every year, it would soon exhaust itself and die of old age."

Will any farmer fail to save his trees from this malignant disease, when it costs so little labor to do so, and, when the reward in fine luscious fruit is so tempting and valuable?

Another good author asserts that "the decay of the peach tree, is, in a great measure, owing to the practice of grafting, whereby an imperfect union takes place; sickly growth is the consequence, and the diseased tree is then rendered vulnerable to the attacks of the worm, which completes its destruction. He recommends strongly the practice of planting out every year, a row of the seeds of the finest peaches to be obtained in the market, and pruning them in their places, until they produce fruit, at which time those of inferior sorts could be grafted, and others of fine flavor might be permitted to remain, with the exception of their retaining health and vigor for many years to come. Peaches of the finest flavor may be obtained from trees the third year, by planting the stone without grafting or budding."

The Curled Leaf, or the Curl, is a disease to which the peach tree is often liable. It generally appears about the first to the middle of May, or during the early part of June. The leaves curl or twist up, become thickened and swollen with cavities on the under and reddish protuberances on the upper side. They remain in this condition some two or three weeks and then dry up and drop off. They are soon renewed by a healthy crop of foliage, and no serious damage is sustained by the tree or its fruit. The malady is caused by *Apis Percae*, or plant lice, that puncture the leaves on the under side. Those having large orchards would, perhaps, not find it profitable to trouble themselves about the extermination of these minute insects, but in small lots or gardens it is well to

*NOTE.—Varieties in this way may be obtained, *true to their kind*, that will be of the finest quality, and being natives, are not so tender—and their duration will far exceed that of the finest budded varieties, and exceed them both in hardness of tree and fruit, thereby avoiding the trouble and delay incident to budding.

do so, as the appearance of the infected trees is unsightly and disfigured for several weeks.

REMEDIES.—A mixture of soft soap and water (the common strong domestic soap) with tobacco stems boiled with it, and applied to the foliage and branches from the under side with a large syringe or garden engine, will soon rid the trees of these insects for the current year at least. If it is done when the leaves are about half grown, it will be seldom necessary to repeat the application. There are other remedies, but as this is cheap, simple and effectual, we deem it unnecessary to insert them.

INJURIOUS INSECTS.

We consider it a highly important matter to direct the attention of our farmers to the study of *Entomology*. We should carefully consult authorities and study and digest whatever we can find touching on this subject, as the injuries arising from the depredations of insects, both to grain and fruits, are incalculable. By studying their habits we learn how to combat them, and ascertain the stages when they are most vulnerable, and the most reliable for their extermination.

Insects rarely attack the most healthy and vigorous trees; hence the importance of effort to keep fruit trees in the most thriving state. The black louse, embodied in the *rough bark of neglected trees*, lays her eggs, and covers them until hatched, then removes to another place and repeats the process. The grain lice are attended by ants, which seem to milk them, living upon a sweet substance exuding from them. Insects are often destroyed by other insects, or insects that breed within them are their constant enemy and our friend and helpers.

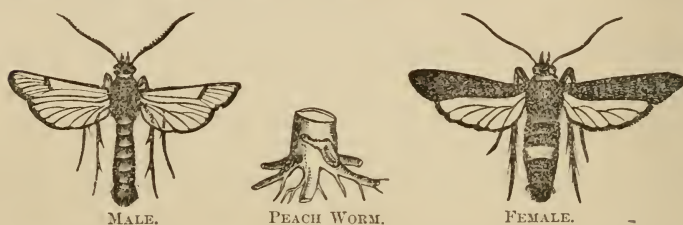
THE PEACH BORER OR PEACH WORM for many years has been the great trouble in peach culture. Its habits, however, at this time are so well understood, that it is not difficult to rid ourselves of this heretofore formidable enemy. Before the appearance of the borer, the most delicious and perfect peaches were raised in the Atlantic States almost without

culture. It was only necessary to plant a stone of any chance seedling, and in the third or fourth year, in due season, without farther trouble, the exquisite blushing peach would charm the sight and be ready to drop into the hand or mouth of the passer-by. The fine grafted varieties were equally a success, and no blighting insect ever dared to tap the soft cheeked fruit or pulpy root of the luxuriant peach. But in the course of time this happy primitive condition of the tree became sadly changed. The Yellows and the Borer were gradually troublesome and fatally prevalent. The cereal crops were allowed to steal away the legitimate and proper food from the trees. Starvation was common, and the two distinctive enemies just mentioned rioted unmolested in our finest orchards. Thanks, however, to the care and skill of modern culture and the science of entomology, we can with ease overcome both these great troubles, and the peach tree may resume its natural luxuriance and vigor and attain its primeval perfection.

The Borer is a voracious intruder that we can manage without difficulty. He does great mischief by girdling and devouring the whole circle of bark just below the surface of the ground, causing the tree to soon languish and die. The symptoms are very similar to that of the *Yellows*; but the true condition can be readily known by examining the crown of the root, where the castings and gum of his operations are unmistakable evidence of his presence.

This insect, *in a perfect state*, somewhat resembles a wasp. It is a slender, dark blue, four-winged moth. The body of the male and female is mostly of a steel-blue color. The wings of the male are transparent, bordered and mixed with the same blue color. The fore wings of the female are blue and opaque—the hind wings similar to those of the male, making considerable difference in the appearance of the sexes. During the Summer, the eggs, which are of a dingy white and scarcely perceptible, are laid on the tree at or near the surface of the ground in little punctions covered with greenish slime. In a few days, they hatch and become small white borers or grubs; they are very tiny and slender at first

and resemble the *ascarides* of the human body. They soon grow three-fourths of an inch in length, with a dark brown head, girdling and devouring the bark and tender sap-wood all the time of their growth. In the worm or grub state, it has six scaly and ten fleshy legs. It goes through its transformations within a year, though worms of two or three sizes may be found at almost any season. When full grown, the worm spins for itself a follicle of silk mixed with gum and excrement or castings, and in due time issues a moth. As it is so well known in this last state, the annexed figure represents the male and female moths:



MALE.

PEACH WORM.

FEMALE.

They commence issuing as moths in central Virginia about the last of June to the middle of July, and sometimes earlier or later. They do not always confine themselves to the peach, but attack the plum tree, and the result is equally fatal. The signs of its presence, however, are different, as it causes no exudation of gum in this as it does in the peach tree.

REMEDIES.—The great modern remedy for the peach borer in the West, is communicated to the "*Western Rural*" by Mr. B. Pullen, of Centralia, Illinois. It is as follows: "As Spring will soon be upon us, I wish to add my testimony in favor of the '*Banking System*' as a preventive against the attacks of the peach borer. As to its efficacy there can be no doubt. I have practiced it for four years with complete success. I would not advise its adoption until after the trees are four years old.* During the most of this period the bark

* After scalding or cutting out the borers, trees two or three years old should receive the benefit of *mounding*. The mounds need be only five or six inches high. For such trees clay or fine dirt should be used. Be sure to leave no borer in the tree, as the signs of his presence are not visible at the root after the mounding.

is tender, and the trees are liable to be girdled by even a single worm. Safety lies only in personal examination and removal with the knife, in *Fall and Spring* (September and April). In April of the fourth year, bank up to the height of from ten to twelve inches, pressing the dirt *firmly around* the tree. A little dirt should be added each successive Spring. It is not only a preventive, but a great saving of labor." (We think for trees four or five years old, mounds from eight to ten inches high, or of the size of tobacco or sweet potato hills, are quite sufficient to prevent the deposit of eggs near the tender part of the crown of the roots—above that, the tree is not vulnerable).

This banking system is practiced (near Cincinnati, Ohio) by E. A. Thompson and others to an extent that most farmers would hardly undertake. They cut back their trees when one year planted. They plant their trees in the Fall, and in the Spring following, cut them back to six inches above the bud. The tree then, instead of having one body, has several—from three to six. The second summer, they plow both ways, turning the furrows towards the trees. The men follow with shovels, throwing the loose soil around the trees to the height of about one foot. In the Fall, the trees are again cut back, taking off about one-third of the year's growth. The next Spring or Summer the same method is pursued, which raises the mound about one foot higher; then cut back in the Fall, and the third Summer repeat the process, raising the mound another foot, which finishes the job. The mound will then be about three feet high at its apex and six feet in diameter at its base. The mounding may be done in the Fall, when the hurry is over. The dirt is never taken away from the trees—in fact, it cannot be removed without injury to the tree, for the young rootlets each year keep climbing up through this mound and form a mass of healthy roots. Now for the benefits: First, they have no trouble with the grub, or borer; *he must have air and light*, and the mound is too much for him; he comes out and that is the last of him. They never worm their trees or hunt for the borer, and more healthy or thrifty orchards than theirs cannot be found.

The magnitude of these mounds will be an objection with most farmers, although Mr. Thompson says "one man can mound fifty trees in one day." But there are three mounding periods, and of course three days required to complete the work. Nothing is said about the result, in the way of fruit, of this repeated cutting back of the *several bodies*, brought into existence by the first cutting of "six inches above the bud." We think there are other remedies equally sure, and rather more eligible, that will not require one hour to practice on fifty trees; and, besides, in the course of a few years the bark of the tree from the apex of the mound to the roots ("which keep climbing up and spreading every year") would become pulpy and tender, and the *borer would reappear and find a lodging as comfortable as before any mounding.

Whilst on the subject of wounds, we have found by experiment that half a peck of pulverized clay, or even common soil, closely packed around the butt of the trees, from one to five years old, in the spring, *and kept close to the bark during tilage* † and well rounded up in the fall, will generally exclude all borers from the crown of the roots. It is best and safest, however, to examine and cut out all borers that may be already at work, or, which would be better, scald them with hot water or soap suds, which will destroy the eggs of the moth, should there be any. This is a very simple, cheap, and effectual remedy and we can recommend it with confidence as all that is necessary to prevent the female moth from the desired access to the roots; or, if eggs are already deposited, they are by this means completely destroyed.

The Virginia Remedy, (Allan and Johnson.)—"Examine the roots of the trees every autumn, and destroy all worms

* For a complete and lengthened history of this insect, so familiar with the peach grower, we refer the reader to Dr. Fitch's most excellent reports; also to some of the numbers of the Practical Entomologist, Philadelphia.

† After the trees have been worked and mounded, it frequently happens that small trees, in swaying to and fro by the winds, make a space between the apex of the mound and the stem of the tree, and a few cracks in the soil or clay about the roots near the stem. These should be filled up as often as they occur with sand or fine soil or clay, or pressed close with the foot, as they are very convenient crevices for the fly that produces the borer to deposit her eggs.

that may harbor there. Lay bare the top of the roots around the neck of the tree, and leave them exposed during the winter to the frost, which will destroy the eggs of the moth; then in the spring, throw around each tree one or two shovels full of red or blue clay." Experience has also proved most conclusively that if about half a peck of air-slacked lime be heaped around the trunk of each tree, or the same amount of leached ashes, by the middle of May, and suffered to remain until the middle of October, the peach borer will not attack it. By this means the most vulnerable portion of the tree is covered and protected from the attack of the insect, and large orchards have remained safe and secure, while unprotected trees have been speedily destroyed. Air-slacked lime and wood-ashes have been recommended, because these fully answer the purpose as protectives, and when spread over the surface, as they should be every autumn, they form the best fertilizers for the peach tree. Charcoal, clay, mortar, &c., have been used with nearly equal success as preventives, and applied in the same way. Some orchardists prefer the knife. They give the trees a regular examination spring and autumn. The earth is removed for a few inches just around the large part or crown of the roots. The presence of the borer is known by the gum or castings surrounding his lodging—follow him up with the point of the knife and he can be eradicated in a few moments without material injury to the tree. This is a very effectual mode, but not so safe as some others, because, the tree is always left exposed to attack and injury until the insect is again dislodged.

Those who raise tobacco can protect their trees, if the borer is not already in, by laying tobacco stems or refuse tobacco about the trunk of the trees in the Spring and Fall.

Black walnut hulls, or rinds, will completely protect the trees if used in the same way, as no insect can exist where they are kept mounded around the stems of the trees. From a peck to two pecks according to the size of the tree is sufficient.

The Scalding Remedy.—Of all the applications yet prescribed for the extermination of the borer in all its stages and

conditions, the most convenient, elegant and effective, is *hot fluid—soap suds, or hot water*. By this means the eggs are destroyed at once and in a moment, and without the least detriment to the trees, whether they be young or old.

For gardens or small orchards, use a large tea-kettle and pot—keep the latter constantly in a boiling state, and use the kettle to apply the fluid. For a few trees only the kettle is sufficient—for extensive orchards more vessels and larger may be established. Prepare a wooden paddle or spadula with a sharp angular point, or basil of any hard wood. With this, scrape from two to three inches of the dirt from around the crown of the roots, clearing away all the gum and castings at the same time. The cavity thus formed will contain from a pint to four pints of fluid, according to the size of the tree. With your kettle, pour around each tree the scalding fluid as hot as you please—if boiling hot, it does not injure the trees. As it subsides, return the soil to the roots with the spadula. Pour a little of the fluid on the gum and castings which must be kept in a heap for this purpose, as these may contain small worms and eggs. The operation may be performed at any time, but the Spring, and again in the Fall, if the insect should be found, is the proper time. April and September are suitable for this purpose. It would be well to examine the trees occasionally during the Summer, and if any borers are found, give such trees the benefit of the hot fluid. This operation is so simple and cheap, of course no careful farmer or gardener will neglect it.

LEAF-HOPPERS (*Thrips*) and PLANT LICE (*Aphides*).—The same remedies are used for both. Syringe them from the underside as well as on the top of the leaves and branches with strong soap suds infused with rubbish tobacco—or dust the leaves once or twice with strong wood or soot ashes.

Mr. Leor, of Mo., says, that plant or bark lice, may be easily destroyed by scrubbing the trees and applying soap suds and the *lye of wood ashes*.



MAGNIFIED WEEVIL.

THE CURCULIO (“*Little Turk.*”)—Next to the borer this is the most formidable enemy to peach culture. He prefers the plum and other smooth skin stone fruits, but when these cannot be found, the peach is his victim.

The State Entomologist of Mo., (Mr. C. V. Riley) gives a very satisfactory account of this “pernicious little scamp.” We insert a few extracts from his first annual report, (1868). (How much to our advantage would it be if our farmers were better posted in Entomology. If we were, or would be true to our own interest in this regard, the produce of the fields, as well as the orchards, would be greatly increased in both quantity and quality; and a little of this useful knowledge, which is within the reach of all, would be a saving or addition of many millions in the productions of the country.)

“It is the business of the Entomologist to teach the farmer and the fruit-grower, how he may prevent the ravages of insects, or the destruction of his crops; how to distinguish between insect friend and insect foe; how to foster the one and destroy the other, before the latter has sufficiently developed to do damage. He is to show up any depredator whose presence the casual observer can only judge by the damage he does; he is to make us familiar with the general appearance of insect friends or foes, in all their changes, and inform us in what guise they do the most damage—for it is a well known fact that, while some, perhaps most, insects do damage in the larva state, like the codling moth, or the potato beetle—others, like the grass-hoppers or chinch-bug, do most damage as perfect insects.

The curculio is the dreaded enemy to the growers of all stone fruit. Mr. Ripley observes: “Although so much has been written about it, I find it necessary to devote a few pages to its consideration, since some of the points in its natural history are not entirely and satisfactorily settled even yet. There is, in fact, conflicting evidence from different authors as to whether it is single or double brooded each year, and as to whether it hibernates principally in the perfect beetle state

above ground, or in the preparatory state below ground; the very earliest accounts that we have of the plum curculio, in this country, differing on these points. Thus it was believed by Dr. James Tilton, of Wilmington, Delaware, who wrote at the very beginning of the present century, and by Dr. Joel Burnett, of Southborough, and M. H. Simpson, of Saxtonville, Ms., who wrote interesting articles on this subject, about fifty years afterwards; that it passed the winter in the larvæ or grub state under ground, and Harris seems to have held the same opinion. But Dr. E. Sanborn, of Andover, Ms., in some interesting articles published in 1849 and 1850, gave as his conviction that it hibernates in the beetle state above ground. Dr. Fitch, of New York, came to the conclusion that it is two brooded, the second brood wintering in the larvæ state in the twigs of pear trees; while Dr. Trimble, of New Jersey, who devoted the greater part of a large and expensive work to its consideration, decided that it is single brooded, and that it hibernates in the beetle form above ground. Since the writings of Harris and Fitch, and since the publication of Dr. Trimble's work, there have been other papers published on the subject. The first of these was a tolerably exhaustive article, by Mr. Walsh, which appeared in the *Practical Entomologist*, (Vol. II, No. 7), in which he takes the grounds that the curculio is single brooded; though subsequently he came to the very different conclusion that it was double brooded. (First Annual Report, p. 67.) In the Summer of 1867, I spent between two and three weeks in Southern Illinois, during the height of the curculio season, and closely watched its manœuvres. From the fact that there was a short period about the middle of July, when scarcely any could be caught from the trees, and that after a warm shower they were quite numerous, having evidently just come out of the ground, I concluded it was double brooded, and communicated to the *Prairie Farmer* of July 27th, 1867, the passage to that effect under the signature of "V," which is quoted by Mr. Walsh, (Rep., p. 67,) as corroborative of its two brooded character. Subsequent calculations induced me to change my mind, and I afterwards gave it as my opinion that there was but one

main brood during the year, and that where a second generation was produced, it was the exception, (Frans. Ills. State Hort. Soc., 1867, p. 113.) Finally, Dr. E. S. Hull, of Alton, Illinois, who has vast personal experience with this insect, read a most valuable essay on the subject before the meeting of the Alton (Ills.) Horticultural Society, of March, 1868, in which he evidently concludes, they are single brooded, and that they pass the winter, for the most part, in the preparatory states, under ground.

Now, why is it that persons, who, it must be admitted, were all capable of correct observation, have differed so much on these most interesting points in the economy of our plum curculio? Is there any explanation of these contradictory statements? I think there is, and that the great difficulty in the study of this as well as many other insects, lies in the fact we are all too apt to generalize. We are too apt to draw distinct lines, and to create rules which never existed in nature: to suppose that if a few insects which we chance to watch are not single brooded, therefore the species must of necessity be double brooded. We forget that curculios are not all hatched in one day, and from analogy are apt to underrate the duration of the life of the curculio in the perfect beetle state. Besides, what was the exception one year, may become the rule the year following. In breeding butterflies and moths, individuals hatched from one and the same batch of eggs on the same day, will frequently, some of them, perfect themselves and issue in the Fall, while others will pass the winter in the perfect state, and not issue until the Spring; and in case of a green worm that is found on raspberry leaves, and which passes the winter under ground, and develops into a four winged fly (*Selandria rubi* of my manuscript) in the Spring; I have known a difference of three months to occur between the issuing of the first and last individuals of the same brood, all the larvæ of which had entered the ground within three days. It is also a well recorded fact, both in this country and in Europe, that in 1868, owing probably to the unusual heat and drouth of the Summer, very many insects which are well known to usually pass the Winter in the im-

perfect state, perfected themselves in the Fall, and in some instances produced a second brood of larvæ. Far be it from me to pronounce there is no such thing as rule in nature, and that we cannot, therefore, generalize; I simply assert that we frequently draw our lines too rigidly, and endeavor to make the facts come within them, instead of loosening and allowing them to encompass the facts. It was thus that the joint worm fly was for so long a time suspected to be a parasite instead of a tree culprit, because all the other species in the genus (*Eurytoma*), to which it was supposed to belong, were known to be the parasite. For those who are unacquainted with the appearance of the plum curculio, in its different stages, I have prepared, at figure 18, correct and magnified portraits of the full grown larvæ (a) of the pupa (b) into which the larvæ is transformed within a little cavity under ground, and of the perfect curculio, (c).

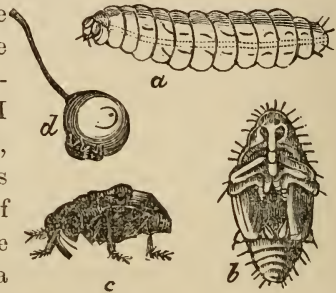


FIGURE 18.

With this prelude I will now give what I believe to be facts in its natural history, founded on my own observations of the past year, and on the observations of others. I firmly believe:

1. That plum curculios are a most unmitigated nuisance, and, though most beautiful objects under the microscope, the fruit growers of the United States, if they had their own way about the matter, would wish them swept from off the face of the earth, at the rate even of interfering with the "harmony of nature."

2. That they are more numerous in timbered regions than on the prairie.

3. That they *can* fly and *do* fly during the heat of the day, and that cotton bandages around the trunk, and all like contrivances to prevent their ascending the trees, are worse than useless, and a result only of ignorance of their economy.

4. That by its punctures it causes the dreaded peach-rot

to spread, whenever that disease is prevalent, though it cannot possibly be the first cause of the disease. The peach-rot is now pretty generally acknowledged to be a contagious disease, of a fungoid nature, and I believe that the spores of this fungus, "a million of which might be put upon the point of a stick whittled down to nothing," attach themselves more readily to fruit which has the skin abraded, and from which the gum issues, than to whole or unpunctured fruit. With this belief I made some effort to procure, for the benefit of my readers, a synopsis of the growth of this fungus; but, alas! I find that nothing but confusion exists with regard to it. Upon applying to my friend, Dr. T. C. Hilyard, of St. Louis—a recognized authority on such subjects—he furnished me with the article which may be found in the *Journal of Agriculture* of January 16th, 1869. I most respectfully declined publishing it in these pages, knowing that the reader would not be likely to understand what was either too *profound* or too befogged for my own comprehension, and those who require a *synopsis* of this fungus are referred to that article. Verily, we must conclude that peach-rot is not yet much understood, if a more clear exposition of it cannot be given.

5. That they prefer smooth-skinned to rough-skinned fruit.

6. That up to the present time the Miner and other varieties of the Chickasaw plum have been almost entirely exempt from their attacks, and that in the Columbia the young larvæ are usually drowned out before maturing.

7. That they deposit and mature in nectarines, plums, apricots, cherries and peaches; in black knot on plum trees, and in some kinds of apples, pears and quinces; and, according to Dr. Hull, they also deposit but do not mature in strawberries, gooseberries, grapes and in the vigorous shoots of the peach tree.

8. That it is their normal habit to transform under ground, though some few undergo their transformations in the fruit.

9. That the cherry, when infested, remains on the tree, with the exception of the English Morello, which matures and then separates from the stem; but that all other fruits,

when containing larvæ, usually fall to the ground. In the larger fruits, four or five larvæ may sometimes be found in a single specimen, and I have taken five full grown larvæ from a peach that had evidently fallen and laid on the ground for over a week.

10. That the greater portion of them pass the Winter in the perfect beetle state, under the old bark of both forest and fruit trees, under shingles, logs, and in rubbish of all kinds, and especially in the underbrush of the woods.

11. That they are always most numerous in the early part of the season on the outside of those orchards that are surrounded by timber, and that they frequently shelter in apple trees and other trees before the stone fruit forms.

12. That a certain portion of them also pass the Winter under ground, both in the larvæ and pupa states, at a depth frequently of from two to three feet.

13. That those that hybernate as beetles begin to leave their Winter quarters and to enter our orchards, throughout central Missouri, during the first days of May, and commence to puncture the fruit about the middle of the same month—a little earlier or later, according to the season—the fruit of the peach being at the time about the size of a small marble.

14. That those which hybernate under ground continue to develop, and to issue from the earth during the whole month of May.

15. That both males and females puncture the fruit for food, by gouging hemispherical holes, but that the female alone make the well known crescent-shaped mark (see figure 18, a) as a nidus for her egg.

16. That the egg is deposited in the following manner, the whole process requiring about five minutes: Having taken a strong hold on the fruit (see figure 18 d), the female makes a minute cut with the jaws, which are at the end of her snout, just through the skin of the fruit, and then runs the snout under the skin to the depth of one-sixteenth of an inch, and moves it back and forth until the cavity is large enough to receive the egg it is to retain. She next changes her posi-

tion, and drops an egg into the mouth of the cut; then, veering around again, she pushes it by means of her snout to the end of the passage, and afterwards cuts the crescent in front of the hole so as to undermine the egg and leave it in a sort of a flap; her object apparently being to deaden this flap so as to prevent the growing fruit from crushing the egg, though Dr. Hall informs me that he has regularly removed the insect as soon as the egg was deposited and before the flap was made, and the egg hatched and the young penetrated the fruit in every instance.

17. That the egg is oval, of a pearl-white color, large enough to be seen with the naked eye, requires a temperature of at least 70° Fahr. to hatch it, and may be crushed with the finger-nail without injuring the fruit.

18. That the stock of eggs of one female consists of from 50 to 100; that she deposits from 5 to 10 a day, her activity varying with the temperature.

19. That the last of those curculios which hibernated in the imperfect state under ground, have not finished depositing till the end of June and beginning of July, or about the time that the new brood developed from the first laid eggs of the season are beginning to issue from the ground; and that we thus have them in the month of June in every conceivable state of existence from the egg to the perfect insect.

20. That the period of the egg depositing thus extends over two months.

21. That all eggs deposited before the first of July generally develop and produce curculios the same season, which issue from the ground during July, August and September, and hibernate in the perfect state.

22. That most of those which hatch after the first of July, either fail to hatch, or the young larvæ die soon after hatching, owing, perhaps, to the more ripe and juicy state of the fruit, being less congenial to them; and that what few do mature, which hatch after this date, undergo their transformations more slowly than the rest, and pass the Winter in the ground.

23. That the perfect curculio while in the ground is soft

and of a uniform red color; that it remains in this state an indefinite period, dependent on the weather, usually preferring to issue after a warm rain.

24. That in a stiff clay soil a severe drought will kill many of them while in this last named condition, and that larvæ contained in stone fruits that fall upon naked plowed ground where the sun can strike them, generally die.

“This catalogue might be lengthened, but already embraces all the more important facts, and I think they sufficiently prove that the curculio is single brooded. There is, it is true, no particular reason why the earliest developed curculios, or those which issue from the ground during the fore part of July, should not pair and deposit its eggs again, other than it does not appear to be their nature to do so. Such an occurrence is by no means an isolated one in insect life; and aside from the fact that *late fruit* is almost entirely exempt from them, we have the experiments of Dr. Trimble, which indicate that they have to pass through the Winter before being able to reproduce their kind.”

Next, Mr. R. gives a list of the cannibal insects that destroy the curculio, which we omit, although valuable. Among the natural remedies, he says a few words in favor of hogs as curculio destroyers. “Abundant proof might be adduced of their utility in an orchard, especially during the first season, but I will mention only the case of Messrs. Winters Bros., of Du Quain, Illinois. These gentlemen, for the past five years, have kept a large drove of hogs in their extensive peach orchard, and have been remarkably exempt from the attacks of the ‘*Little Turk.*’ While at their place last Fall, I noticed that all the trees were banked up with earth to the height of over a foot, which prevented the hogs from injuring the trunks. They have never had occasion to shake their trees, and consider one hog to the acre sufficient to devour all the fallen fruit, the hogs being fed only during the Winter. The efficacy of this hog remedy depends a great deal on how one’s orchard is isolated from those of others, for it is very evident that it will avail but little for one farmer to destroy all his curculio, while his neighbors are breeding them by thousands,

so that they can fly in upon him another year. They would also be of but little service in the case of the cherry, as it remains on the tree when stung. Poultry will be found very valuable in an orchard, as they also destroy the grubs that fall with the fruit.

ARTIFICIAL REMEDIES.—Of the hundreds of patent nostrums, and of the dozens of washes and solutions that have been recommended as curculio preventatives or destroyers, there is scarcely one which is worth the time required to speak of it. Air-slacked lime thrown on the trees after the fruit is formed, is effectual in a certain measure, for though it does not deter the female from depositing her eggs, yet so long as the weather is wet, its caustic properties seem to be imparted to the water and enter the cavity and destroy the egg. But it has no good effect in dry weather. An article went the rounds of the papers last Summer to the effect that Mr. P. E. Rust, of Covington, Ky., had tried burning tobacco stems with *perfect success!* But a letter of enquiry which I addressed that gentleman was never answered, although it contained the requisite 3 cent postage stamp, and the tobacco remedy may be placed beside the gas tar and coal tar remedies, which have proved utterly useless. After all, as Dr. Hull suggests, the success so reported of these remedies, take its origin from insufficient experiment, by persons who are little aware of the casualties to which the curculio is subject, and who, after they happen to get fruit after applying some particular mixture, immediately jump to the conclusion that it was on account of such mixture.

“It may, therefore, be laid down as a maxim, that the only effectual and scientific mode of fighting the curculio, aside from that of picking up the fallen fruit, is by taking advantage of its peculiar instinct which on the approach of danger prompts it to fall; or in other words to catch it by jarring the trees. The most effectual method of doing this on a large scale is by means of Dr. Hull’s “curculio catcher,” and we give a description of it in the Doctor’s own words:

“To make a curculio catcher, we first obtain a light wheel, not to exceed three feet in diameter, the axletree of which

should be about ten inches long. We next construct a pair of handles, similar to those of a wheelbarrow, but much more depressed at the point designed to receive the bearings of the axletree, and extending forward of the wheel just far enough to admit a cross-beam to connect the handles at this point; one-and-a-half inches in rear of the wheel, a second cross-beam is framed into the handles, and eighteen to twenty-four inches farther back, a third. The two last named cross-beams have framed to their under-sides, a fourth piece, centrally, between the handles, and pointing in the direction of the wheel. To the handles and to the three last named pieces, the arms or ribs to support the canvass are to be fastened. To the front part of the beam connecting the handles in front of the wheel, the ram is attached; this should be covered with leather stuffed with furniture moss, a dozen or more thicknesses of old hat, leather or other substance, being careful to use no more than necessary to protect the tree from bruising. Ascertain the elevation the handles should have in driving, and support them in that position. We now put in place the stockers, or arms, six for each side, which are to receive and support the canvass. We put the front arms in position. These extend back to near the centre of the wheel on each side, and in front of the wheel (for large machines), say six feet, and far enough apart to receive the largest tree between them on which it is to operate. The remaining arms are supported on the handles, and fastened to them and to the two cross and parallel pieces in rear of the wheel. These are so placed as to divide the space at their outer ends equally between them and the first mentioned stretchers and fastened to the ends of the handles. Next, we have ready a strip of half-inch board two and a half wide. One end of this is secured to the forward end of one of the front arms, and in like manner to all the others on one side of the machine, and fastened to the bundles. Both sides are made alike. The office of these strips is to hold the outside ends of the arms in position; they also prevent the front arms from closing. These outside strips also receive the outside edge of the canvass, which is fastened to them as well as to the several arm supports.

“It will be seen that the wheel is nearly in the centre of the machine. To cover the opening at this point, a frame is raised over it, which is also covered with canvass. The arms, or stretchers, are so covered that the motion of the machine, in moving from one tree to another, should bring everything falling on the canvass to depressed points, one on each side of the wheel, where openings are made into funnels emptying into pockets or bags, for the reception of insects and fallen fruit. The whole machine should not exceed ten or eleven feet in breadth, by twelve or thirteen in length. These are for large orchard trees; smaller ones could be protected by a much smaller machine. If the frame work has been properly balanced, the machine will require but little lifting and will be nearly propelled by its own weight.

“This curculio catcher, or machine, is run against the tree three or four times, with sufficient force to impart a decided jarring motion to all its parts. The operator then backs far enough to bring the machine to the centre of the space between the rows, turns round and in like manner butts the tree in the opposite row. In this way, a man may operate on three hundred trees per hour.”

To run this machine successfully three things are necessary: 1st. That the land be decently clean, and not over grown with rank weeds. 2nd. That the orchard be sufficiently large to pay the interest on the prime cost of the machine—about \$30. 3rd. That the trees have a clean trunk of some three or four feet. I find various modifications of this machine, both in our own State and Southern Illinois, and in some instances they have been abandoned entirely on account of the injury caused to the trees from the repeated blows given to the trunk. In small orchards it will be found most profitable to drive a spike into the trunk of each tree and to use two sheets stretched on frames, which can both be dragged or carried and placed in position by one man, while a second person gently taps the the iron spike * with a mallet. To bring down the curculio,

* A word in regard to the “iron spike”—the use of which it seems to us would do far more injury to the tree than the butting of Dr. Hull’s machine, well “padded with old hat.” Why not riven a spike in a curved block of wood, well padded with old hat, and let the operator hold this against the trunk with one hand and give the sudden tap with the mallet on the broad-head of the spike with the other hand?

it requires a light *sudden* tap, which jars, rather than a blow which shakes, and if the frames are made so as to fold in the middle, it will facilitate disposing of those insects which fall upon it.

In conclusion, the intelligent fruit-grower can draw many a lesson from this account of the curculio—already somewhat lengthy. Thus in planting a new orchard with timber surrounding, the less valuable varieties should be planted on the outside, and as the little rascals congregate on them from the neighboring woods in the early part of the season they should be fought persistently. It will also pay to thin out all fruit that is within easy reach; while, whenever it is practical, all rubbish and under-brush should be burnt during the Winter, whereby many, yes *very many* of them, will be destroyed in their winter quarters. As a proof of the value of this measure when it is feasible, I will state that while the peach crop of Southern Illinois was almost an entire failure in 1868, Messrs Knowles & Co., of Macanda, shipped over nine thousand boxes, (9000). Though they had a few hogs in the orchard, these were not enough to do any material good, and they think they owe their crop to the fact of having cleared and burnt 100 acres surrounding the orchard, in the early Spring of that year; for, in 1867 curculios had been very bad with them. Judge Kimble, who lives 4 miles north-east of Cobden, also had a good crop free from their marks, which he attributes to having burnt around the orchard in the Spring of the year.”

Having all these measures for defence and protection within our reach against the only two insect enemies of any note that disturbs the peach tree and its splendid fruit, we can very well afford to use *some of them* to insure remuneration and profit in its culture. It is very obvious that the peach, is, not only the most delicious and wholesome, but the most valuable and saleable fruit that can possibly be raised in the temperate regions of the South—taking into consideration the ease and small amount of labor required in its cultivation.

PEACH FAMILY—CATALOGUE OF VARIETIES *

It is not our purpose to perplex and bewilder the cultivator of this esteemed fruit with the long lists which some authors and nurserymen inflict on those who wish to engage in peach culture. Our aim is to be really useful, by recommending only those varieties whose fine qualities are well known and appreciated, whether new or old. There can be no real advantage secured by choosing to cultivate a great many sorts, from good to bad, merely for the purpose of display or curiosity. Short lists and fine fruit should be our motto.

American peaches, when cultivated in England, for want of dry atmosphere, sun and heat, generally prove second rate in that country, and will not ripen at all unless under glass, or indifferently by the side of walls. It is also believed that many of the best European varieties are much finer here than in England, or even in their native soil. In the various lists which we have prepared for this work, some choice European varieties are included. We have done this, because several standard authors think such selection will improve our American collection by introducing their high qualities. They believe some of them to be purer and healthier in constitution than many of our native kinds. But, as a general thing, it is admitted that our best native varieties are far superior in every respect to those of European or foreign origin.

In describing peaches, the similarity of varieties is so nearly identical that writers on this subject have resorted to their particular characteristics to enable them to distinguish one from another. The natural classes are, *free-stones* and *cling-stones* (melters and paviors), and a small class partaking of the peculiarities of each—*adhering slightly to the stone*.

The most notable natural distinction is in the *leaves*. At the lower end or base of some kinds, are found small *glands*,

* As but little Southern fruit has passed the ordeal of Southern Pomological Societies, the selection, classification and description of both apples and peaches are necessarily somewhat irregular and defective. This, we hope, will soon be remedied. The great increase of fruit culture will require the formation of numerous Societies in all parts. As the value of fruits become better understood and the adaptation of the various Southern regions to all the best fruits becomes better known, Pomology will receive the attention it deserves, in a fine fruit-growing country.

generally round, but sometimes irregular and oblong. The leaves of other kinds have no glands and are more deeply notched or *serrated* on their margins or edges. These differences in the foliage aid the Pomologist in recognizing the different varieties forming these distinct classes.

1. Leaves serrated *without glands*.
2. Leaves serrated with small *round glands*.
3. Leaves with large, irregular *reniform glands*.

This distinction in the leaves is useful, as it aids in verifying an opinion, when the fruit is examined, any time when the foliage can be referred to.

There is a difference also in the *blossoms*, which is fixed and invariable, affording marked subdivisions in the varieties of this fruit. The first has *large flowers*, always red in the centre and pale in the margin. The second has *small flowers*, tinged with dark at the margin.

We shall not follow other authors in dividing peaches into "three different and distinct classes," but shall divide them into five, and give a short list of varieties composed of each:

1. *Free-stone peaches*, with *pale flesh*.
2. *Free-stone peaches*, with *deep yellow flesh*.
3. *Cling-stone peaches*.
4. Varieties that adhere partially to the stone.
5. Varieties that reproduce the same from the stone.

CLASS I.—*Free-stone Peaches with pale flesh.*

1. MORRIS' WHITE.—Rather large; roundish, inclining to oval; suture medicinal, small point; white to the stone, seldom a purple tinge in the sun; flesh white, melting, of a rich sweet flavor; middle of September. Very popular in warm regions. Highly prized for preserving.

2. ROYAL GEORGE—(*P. Mag., Lind., Thomp.*)

In regard to flavor and beauty, this variety is unsurpassed. It is one of the finest European peaches, and attains the highest favor in this country. It is a regular and moderate bearer, and is one of those varieties indispensable to every fine orchard and garden, ripening directly after the Early York.

This peach should not be confounded with *Early Royal*

George, Red Magdalen, Smooth Leaved Royal George, &c., of some Northern nurseries, described by Manning, as these have globose glands, and are distinct varieties and not so high-flavored and rich.

Leaves serrated, with glands. Fruit above the middle size, globular, broad and depressed, the suture broad and deep at the top. Skin pale, or white, thickly sprinkled with red dots, and the cheek of a broad rich, deep red, slightly marbled. Flesh whitish, but very red at the stone, melting, juicy, very rich, and of the highest flavor. From the 1st to the 20th of August.

3. DOUBLE MONTAGNE—(*Downing, Lind., Thomp.*)

A high-flavored and beautiful peach, much resembling the Noblesse. It is of French origin, and is a favorite variety with English gardeners. We think it one of the finest peaches of the Middle States. Leaves serrated, without glands. Fruit of medium size, roundish, but somewhat narrower at the top. Skin pale greenish white, with soft red cheek, which is marbled with darker red at maturity. Flesh white to the stone, very delicate and melting. Flowers large. First of August.

4. EARLY TILLOTSON.—Well deserving the high favor in which it is held.

It is unquestionably one of the most desirable of all the early free-stone peaches. It ripens in the vicinity of Richmond, from the 15th to 25th of July—full two weeks before the Early York, or any of the very choice kinds, and only a few days after the Early Anne. It is much higher flavored than any peach that ripens previously, or for some days after it, and as a garden variety is entitled to universal favor. Fruit medium size; skin dotted in the shade, dark deep red in the sun; flesh whitish, red at the stone, *to which it partially adheres*; juicy, rich, high flavored. Leaves serrated, without glands. Tree hardy, and a great and constant bearer.

5. EARLY YORK.—(*Serrate Early York.*)

This is one of the most popular peaches in this country, and is one of the very best early orchard varieties; tree hardy and very productive; fruit medium size; skin greenish white

dotted with red in the shade, dark red to the sun; flesh greenish white, very tender, juicy, rich and excellent. There are a few seedlings raised from this, and bearing the same name, which are rather more thrifty, but do not possess the high *flavor* of the original kind. They are easily known from it by the absence of glands in the leaves and by the *large* flowers of the true sort. Last of July and first of August.

6. EARLY ANNE.—(*Down. Lind. Thomp.*)

The Early Anne is an old and familiar sort. It is the first peach of any value that ripens. The Red and White nutmegs being too small, and of indifferent flavor; and the Early Anne itself is inferior to the Early Tillotson, but it is a few days earlier and will be cultivated by all amateurs. The tree is of slender growth. Leaves serrated, without glands. Fruit rather small, round; skin white, with a faint tinge of red next the sun; flesh white to the stone, soft, melting, sweet, and of pleasant flavor; flowers very large, nearly white. Profitable for early market.

7. HONEY PEACH.—A new variety from South Carolina, where it ripens the last of June. Described as of the finest quality, and promising to be very saleable as an early market peach. Oblong, skin yellowish, mottled with red and crimson, of a peculiar honeyed sweetness.

8. GEORGE THE FOURTH.—(*Down. Floy. Lind. Thomp.*)

This is the most popular peach for garden culture in the United States. It is large, bears regular and abundant crops, is of the highest flavor, and the tree is unusually hardy and vigorous, *succeeding well in all parts of the country*. Leaves large, with globose glands, often obscure. Fruit large, round, deeply divided by a broad suture, and one half a little larger than the other. Skin pale, yellowish white, finely dotted with red, and deepening into a dark red cheek on one side. Flesh pale, marked with red at the stone, which is small, melting, very juicy, with a remarkably rich luscious flavor. Middle of August below and around Richmond, Va.

9. HALES' EARLY.—A very valuable, extra early peach, of recent introduction. Tree a very vigorous grower and abundant bearer; fruit medium size, handsome and well flavored,

flush white, ripening a week to ten days early than the *Troth's Early*. This is now the peach for profitable orchard culture, where *earliness* is the object. This Ohio peach is justly regarded as the very best early variety in cultivation.

10. EARLY SWEETWATER.—(*Cole. Down. Floy. Thomp.*)

This is a very early and very agreeable white peach, among the best of its season, ripens not long after the Early Anne, and ten days or more before the Early York. It is an American peach, raised from the stone of the Early Anne. It is so much larger and superior to the Early Anne, or any of the nutmeg peaches, that it has almost driven them from our gardens. The tree is thrifty and productive, with pale shoots and nearly white blossoms. Fruit medicinal, roundish, whitish; flesh white, juicy, melting sweet; of medium size, frequently large, with a slight suture. Skin pale white, very seldom with a faint blush when fully exposed; slightly stained with red at the stone.

11. TROTH'S EARLY.—A very early and excellent peach, medium size; skin whitish, with a beautiful red cheek—flesh juicy, sweet, very fine—one of the most profitable varieties for early marketing. We are cultivating it largely for this purpose. (We quote Franklin Davis & Co., of Richmond Nurseries.) Flesh white, resembles the Early York—early part of July.

12. OLD MIXON FREE.—*Pom. Man. Old Mixon Clearstone, Coxe.*

This is a very large American peach—it matures late and is of rich and high flavor. It is supposed to have been raised from a seed of the Catharine Cling or the Old Mixon Cling, the latter was introduced into this country many years ago, by Sir John Oldmixon. It is highly productive and is a very valuable variety. It is fair and large, succeeding well in all localities, and well deserving the high favor in which it is held, as an orchard variety. Skin yellowish-white with a deep red cheek; flesh white, but red at the stone, tender, rich, excellent. Tree hardy, flowers small, globose glands—September.

13. SNOW PEACH.—A most beautiful fruit, medium size; skin

and flesh clear, creamy white throughout. Tree hardy and productive—blossoms pure white and shoots greenish—very distinct—one of the most desirable of all the white peaches for preserving. This remarkably fair and elegant fruit is of American origin. The foliage is a light green—fruit exceedingly juicy, melting, with a sweet, rich, sprightly flavor. Last of August to middle September.

14. DRUID HILL.—This is a free-stone peach of splendid size, high flavor, and very late maturity. It originated with L. M. Rogers, of Druid Hill, near Baltimore, and was named after his country seat, by A. J. Downing, who says, "We know no other late free-stone variety which *equals* it in flavor and size. The tree is unusually vigorous, the shoots and leaves very large, and it bears abundantly. The very late season of its maturity renders it valuable, as most of the luscious sorts are then gone. Fruit very large, roundish, skin pale greenish-white, clouded with red on the sunny side. Flesh greenish-white, purple at the stone, very juicy and melting, with an exceedingly rich vinous flavor. Flowers small, globose glands. Ripens from the 20th of September to 1st October.

15. TETON DE VENUS.—Large roundish, inclining to oval, a broad suture dividing all around; pale yellowish green, pale red cheek, juicy, melting, *exquisite flavor*. One of the very best free-stones—September.

16. RED RARE RIPE.—A fine old variety. Large, Red Rare Ripe of some—Early Red Rare Ripe—White, with a dark red cheek, flesh pale, rich and high flavored, red at the stone, melting, juicy, very high flavored; flowers small; fruit rather large, globular, but broad; leaves serrated—without glands. August.

"It must be observed that this is totally different, both from the *Early York* and Morris's Red Rare Ripe, with which it is often confounded by some nurserymen. The fruit is larger, broader and a week later than the first; and its serrated leaves and different flavor, separate it widely from the latter."

17. PRESIDENT.—*P. Mag. Lind. Thomp.*

A fine variety. Fruit large, roundish oval, the suture shallow. Skin very downy, pale yellowish green, with red dull cheek, juicy, rich and high flavored; stone very rough, flowers small. Matures early in September. (Can be obtained at both the Nurseries near Richmond) and at other Nurseries in Virginia, and at Franklin Davis & Co's Nursery at Goldsboro, North Carolina.

18. LATE RED RARE RIPE.—*Downing.*

This noble American fruit is unquestionably one of the very finest of all peaches, even surpassing the *Late Admirable*. Its large size, and great excellence; its late maturity, and its productiveness and vigor, all unite to recommend it to universal favor. We cannot praise it too highly. The rather *grayish* appearance of the fruit serves to distinguish it at first sight from all others.

Leaves with globose glands; fruit large and heavy, roundish oval, suture depressed only at the top, where the swollen point is distinctly sunken. Skin downy, pale grayish yellow, thickly marbled and covered with reddish spots; cheek dull deep red, distinctly mottled with fawn-colored specks. Flesh white, but deep red at the stone; very juicy, melting, and of an unusually rich, luscious flavor, not surpassed by any other peach. Last of August to 1st of September.

19. ROYAL HENSINGTON (Grosse Mignonne)—*O. Duh., Lind., Thomp.*

The "world-renowned" of peaches. Not only highly esteemed in France, its native country, but in England and America. It is among the most popular and considered the most superb peach in cultivation. The great number of names by which it is known abroad, and we have only quoted two of them, proves the universality of its cultivation. It is a large and very handsome fruit; is a great and regular bearer, ripens well under glass, and will flourish even in unfavorable climates. Leaves with globose glands. Fruit roundish, somewhat depressed, marked with a hollow suture or seam at the top. Skin pale greenish yellow, mottled with red, with purplish red cheek. Flesh yellowish white, marked with red at

the stone; melting, juicy, with a very rich, high, vinous flavor. Stone small and very rough. Middle of August, before the Royal George. The flowers are very large.

20. TUFT'S RARERIPE.—Medicinal; roundish, yellowish, with a bright red cheek. Flesh melting, very sweet and luscious. Free-stone. Very hardy, vigorous and productive. Globose glands. *Produces the same from the seed.* We have hundreds of seedlings, *all perfectly uniform* (we quote Coles). Middle of September.

21. MORRIS' RED RARERIPE—*Large Red Ripe, Early Red Rareripe of some.*—Large, roundish, expressed at top, distinct suture, greenish white, bright red cheek, flesh greenish white, red at the stone; very melting and juicy, with fine, sweet, rich flavor. Free-stone, globose glands, small flowers. This fruit is highly esteemed in Virginia and the Carolinas and farther South. Originated near Philadelphia by Robert Morris, Esq., and was disseminated from his gardens. It is everywhere esteemed for its fine flavor, beauty and productiveness. Some American writers have erred in supposing it synonymous with the Grosse Mignonne, which is quite different, both in color of its skin and flesh, as well as in flavor and blossoms. Ripe in August.

22. ANNA RUFFIN.—This is said to be a splendid variety and *eminently adapted to Southern climates.* The author has not been able to get a fair description of it, but from report no Southern garden or orchard should be without it.

23. HEATH FREE-STONE.—*Kenrick's Heath. Ken.*

This variety very much resembles the *Heath Cling*, so celebrated in the South. It is large, showy, oblong, growing to the very largest size, and a very hardy tree. The quality of the fruit at the North is second-rate, but in the fine peach regions of the South it is very fine. Its remarkable size and appearance is an offset to any deficiency in flavor. Flesh greenish white, deep red at the stone, a little coarse, melting, tender, juicy, with a very pleasant sub-acid flavor. Flowers small. Early in September.

24. LA GRANGE—(*Downing*).

Leaves with uniform glands. Fruit large, oblong, shaped

somewhat like the Heath Cling. Skin greenish white, with occasionally some red on the sunny side. Flesh pale, juicy, melting, very rich, sweet, high-flavored and delicious. Middle to last of September. Flowers small.

This fine white free-stone peach was originated near Burlington, New Jersey. Its period of nativity (*early in October there*), its color, its productiveness and fine size, have given it a reputation among the extensive growers of New Jersey; and it is, undoubtedly, a most valuable fruit, not only for the table, but for preserving at the most desirable time for this purpose—late in the season. Its flavor is remarkably rich and delicious, equaling, in this respect, almost any peach of its season of maturity.

25. WARD'S LATE.—This is a fine, late, free-stone variety, ripening from the middle to last of September. The tree is vigorous and productive, and the fruit generally of large size. Skin white, with a fine crimson cheek, flesh white to the stone (splendid for preserving), juicy, melting and excellent.

26. BELLE DE VITRY.—Medium to large, rather broad, with a deep suture, top depressed, pale yellowish white, tinged and marbled with bright and dull red; firm, melting, red at the stone, juicy and rich. Free-stone. Leaves serrated, without glands. Free-growing and hardy. This is not the Belle de Vitry of most Northern orchards and gardens, which is the *Early Admirable*; nor is it the *Late Admirable*—but is a distinct variety. It is the Belle de Vitry described by *Duhamel*, and is a firm-fleshed and most excellent peach. September. (*Duh., Lind., Thomp.*)

27. BELLE GARDE—(*O. Duh., Lind., Thomp.*)

This fine fruit bears many French and English names, and we will not bother our readers by enumerating them, it being better known in this country by the one we have selected.

This splendid French peach is one of the most popular in the Paris markets, and it is highly esteemed by the English. It is also one of the handsomest and most delicious fruits here.

Leaves with globose glands. Fruit large, round and regular, the suture shallow, the top slightly hollowed, and having a little projecting point. Skin pale yellowish green, with a

rich red cheek, often streaked with dark purple. Flesh slightly marked with red at the stone, a little firm, but very melting, juicy, rich and high-flavored. Stone rather large. Flowers small. Middle of August.

28. NUTMEG, WHITE—(*Mill., Lind., Thomp., Down., O. Duh.*)

The White Nutmeg is a very small and rather inferior peach. It is dwarfish in habit and of slender growth. It is esteemed by the curious as ripening a few days earlier than any other variety, and is earlier and better further South.

Leaves serrated, without glands. Fruit very small. Skin white, rarely with a pale blush. Flesh white to the stone, with a sweet and slightly musky flavor. Ripens from the first to the tenth of July. Flowers large.

29. NUTMEG, RED.—This resembles the foregoing in its general habit. It is desirable in a complete collection. Both this and the foregoing are European varieties.

Leaves small, with reniform glands. Fruit small. Skin pale yellow, with a bright rich red cheek. Flesh yellowish white, red at the stone, with a sweet and rather pleasant flavor. Season middle of July.

30. LARGE YELLOW YORK.—(*New York Rareripec, of Coxe.*)

A large and beautiful peach. Skin white, with a deep red cheek. Flesh nearly white, very juicy, fine grained, with a mild, rich, excellent flavor. The tree is vigorous and productive. Leaves with globose glands. Origin, Flushing, New York. Matures early in August. This is a valuable and showy peach, well worthy a place in every good collection.

31. THE GORGAS.—Originated with Benjamine Gullip, in Philadelphia, from a stone of the "Morris White." Size two and a half inches by two and three quarters; roundish, with a slight prominence at the apex; dull greenish white, clouded and blotched with red on the exposed side; cavity wide, rather deep, freestone, flush whitish, slightly stained at the stone, juicy; flavor saccharine and exceedingly luscious; quality best; period September.

32. NOBLESSE.—*Synonyms.*—Lord Montague's Noblesse,

Mellishe's Favorite, Canguerd, Noblest, Double Montague.
(Description by Elliott.)

Size above medium to large; form roundish, sometimes with a roundish oblong, and the point at apex quite prominent. Skin, pale greenish white, marbled and streaked with two shades of dull red in the sun, occasional faint blotches of red on the shaded side; flesh, greenish white, very juicy, melting, with a rich, delicious flavor; stone, large, pointed, separates freely from the flesh, and without any stain of red; season, early in September.

Tree, moderately slow grower at the North, and somewhat liable to mildew when not in good ground. At the South it grows vigorously, and does not mildew. The flowers are large and the leaves serrated without glands. Originated in France.

REMARKS.—The Noblesse is one of the old varieties whose good qualities have as yet been unsurpassed by any of recent origin. It is of the richest and highest flavor, and being entirely white at the stone, is quite desirable for canning or preserving.

NOTE.—According to Berckmans, "in Georgia, the earliest peaches begin to ripen the middle of June, and the season is often prolonged until the middle of November, a period of five months. Cling stones are a favorite class, but if picked before maturity, they do not ripen well and are apt to shrivel; and if left on the trees until fully ripe, they are unsuitable for shipping, and hence adapted to home use. Free stones must be raised for marketing.

CLASS II.—*Free-stone Peaches with deep yellow flesh.*

Peaches of this class are nearly all of American origin. The *Yellow Alberge* of Europe is considered the original type from which the various sorts and modifications of this class have been derived. They are not esteemed as being so rich and highly-flavored as the class already described, and do not succeed so well in Northern latitudes, as it requires the long hot summers of more Southern climes to develop their high, luscious, juicy and exquisite qualities. In *cold climates* they become somewhat acid and unpleasant. In England, for lack of dry atmosphere, sun and warmth, they

prove inferior, and also at the northern limits of peach culture in this country. They are rather more liable to the depredations of insects and more apt to suffer from the “*yellows* ;” but these objections have but little weight when it is recollected they are superior in sweet, melting, vinous and medicinal qualities to Class I.

33. CRAWFORD'S EARLY.—(*Crawford's Early Melocoton.* Ken.*)

A magnificent, large, yellow peach of fine quality. Tree exceedingly vigorous and prolific; its size, beauty and productiveness make it one of the most popular of early varieties. Downing says: “This is the most splendid and excellent of all early yellow-fleshed peaches. As a market variety it is the most popular of the day, and it is deserving of the high favor in which it is held by all growers of the peach.” It was originated by William Crawford, Esq., of Middletown, New Jersey.

Fruit very large size; flesh very juicy, rich, slightly subacid, of fine flavor, the suture shallow, skin yellow, flesh yellow, melting, sweet and very excellent. Flowers small. August.

34. CRAWFORD'S LATE.—(*Crawford's Melocoton. Crawford's superb Malacature.*)

From the same source as the foregoing. A superb yellow variety, very large, rich, splendid flavor—productive. As a general thing the fruit is extremely large, roundish, with a slight suture. Flesh deep yellow, but red at the stone, juicy and melting, with a very rich, and excellent vinous flavor. September.

As a splendid and productive market fruit, it is unrivalled; and its size, beauty and excellence will give it a place in every garden.

35. YELLOW ALBERGE.—(*Yellow Rare Ripe. Thomp., Downing.*)

The Yellow Alberge, a *Yellow Rare Ripe* of many American nurseries and gardens, and is also known by other names, is an old French variety, and one of the *earliest* of the yel-

* *Melocoton* is Spanish for peach.

low-fleshed peaches. "It is, no doubt," says Downing, "the original sort from which our Molocotons and Yellow Rare Ripes have sprung in this country." Although it is considered by some as second-rate in flavor, yet in rich warm soils and farther South, it is very superior in both size and quality, and very productive.

Leaves with globose glands. Fruit large, roundish, with a well marked seam or furrow running half round. Skin yellow, with a very deep, purplish red cheek. Flesh yellow, but red at the stone—soft, juicy, sweet, with a pleasant vinous flavor. July 20th to middle of August.

36. BRAYNARD'S YELLOW.—(*Allan & Johnson.*)

A new and very large yellow peach, of splendid quality, rich and juicy. We regret not being prepared to fully describe it; but it is represented as being among the very first as to quality.

37. RED-CHEEK MELOCOTON.—(*Coles, Allan, Davis.*)

Large, roundish, oval, a swollen point; yellow; a deep red cheek; flesh yellow, with red at the stone; melting, juicy, rich, of a vinous flavor, frequently too acid at the North; well adapted to Southern States; very productive. This is a famous old and well known popular Southern variety, extensively cultivated as a market fruit.

38. YELLOW RARE RIPE.—Large Yellow Rare Ripe—*Marie Antoinette*.—Down.

One of the finest, very early yellow fleshed peaches. It is an American seedling, and well deserves the extensive cultivation it receives, both in the orchard and garden. Leaves with globose glands. Fruit large, roundish, the suture slightly depressed, extending more than half round; the swollen point at the top small. Skin deep orange yellow, somewhat dotted with red, cheek rich red, shaded off in streaks. Flesh deep yellow, but red at the stone; juicy, melting, with a rich and excellent vinous flavor; stone small, flowers small. Last of July.

This must not be confounded with the Yellow Malagatune, or Yellow Rare Ripe of some orchards, which is a much inferior and an older sort, whose fruit is below medium, with

scarcely any red, and inferior in every respect to the kind we have just described.

39. COLUMBIA.—*Coxe, Down.* (Georgia Peach, Indian Peach.)

The Columbia, according to Downing, is a singular and peculiar peach. "It was raised by Mr. Coxe, the author of the first American work on fruit trees, from a seed brought from Georgia. It is a very excellent fruit, which every amateur will desire to have in his garden. The tree is not a very rapid grower, and bears only moderate crops, being, of course, all the less subject to speedy decay. The young wood is purple."

Leaves with reniform glands; fruit quite large, globular, broad and much depressed; suture distinct, extending half way round; skin rough and rather thick, (*almost curculio proof*), dull dingy red, sprinkled with spots and streaks of darker red; flesh very bright yellow, of the texture, as Coxe remarks, of a very ripe pine-apple, rich, juicy, and of very excellent flavor. Latter part of August.

40. SMOCK'S FREE.—*Hen. Down.*

In some nurseries this is known as St. George, and is an October peach at the North. It is quite popular as an orchard fruit. It was originated by Mr. Smock, of Middletown, New Jersey, the centre of peach cultivation of that region.

Leaves with reniform glands. Fruit large, oval, narrowed towards the sides; skin light orange yellow, mottled with red, or often with a dark red cheek, when fully exposed; flesh bright yellow, but red at the stone; moderately juicy, rich. Last of September and first of October.

41. POOLS' LARGE YELLOW.—*Hen. Down.*

A very large and excellent deep yellow peach, with a dark red cheek, of fine quality; fruit roundish, with a suture extending from the base to the top; skin deep yellow, flesh yellow, but red at the stone, rich, juicy, and of excellent flavor. It is of the Malacoton family, and is worthy of extensive cultivation. It originated near Philadelphia, and bears heavy crops. Tree hardy; leaves with reniform gland. Middle of September.

42. HATCH.—*Coles*. (Originated by S. O. Hatch, Ct.)

Very large; roundish, pointed, shallow suture; skin deep yellow, flush in the sun; flesh yellow, melting sweet and excellent; free-stone. *It produces the same from seed*, which, with its earliness, hardiness, and superior quality, renders it an admirable peach. We have hundreds of seedlings *perfectly uniform*. Globose glands. Middle of August.

43. BERGEN'S YELLOW.—*Down*.

Bergen's Yellow is a native we believe of Long Island. It is a very large fruit, and of very delicious flavor. It is darker colored, more depressed in form, rather finer flavored, and ripens some days later than the Yellow Rare Ripe, which it much resembles. It is a moderate but good bearer. It is earlier, and much superior to the Malacoton, and its glands distinguish it also from that variety.

Leaves with uniform glands. Fruit very large (often measuring 9 inches in circumference,) globular, depressed and broad; the suture well marked, and extending half round; skin deep orange, dotted with same red, and with a very broad dark red cheek; flesh deep yellow, melting juicy, and of rich and luscious flavor; flowers small. Ripens latter part of August.

44. BALTIMORE BEAUTY.—A very good and remarkably handsome peach, of native origin—originated near Baltimore. Leaves with globose glands; fruit rather small; roundish, oval; skin deep orange, with a brilliant red cheek; flesh yellow, but red at the stone—sweet, very good, a little mealy if over ripe; flowers large. Last of July and first of August.

45. TUFT'S RARE RIPE.—Medicinal, roundish, yellowish, with bright red cheek; flesh yellow, melting, very sweet and luscious; free-stone; very hardy, vigorous, and productive; globose glands. Produces exactly the same from the seed, and all its seedlings are perfectly uniform—hence the value of this fine variety—it saves grafting.

46. MERRIAM.—Extremely large, short, oval, light yellow, bright red cheek; flesh yellow, red at the stone, melting, very juicy—of a sweet luscious flavor, of the first rank in size, beauty

and quality; globose glands; *new and promising*. Last of September.

47. HEATH FREE.—A very large September peach. A seedling of Southern origin; matures only in the South. In some situations this is a very fine peach. It somewhat resembles the Heath Cling, externally. Fruit large, skin white, flesh white, very juicy, tender, with excellent flavor. Early in September.

48. SUSQUEHANNA.—A very large, *new* and superb yellow peach; melting, sweet, juicy, with a rich vinous flavor; skin rich yellow, with a beautiful red cheek; very handsome. August and September.

This new and valuable peach originated on the banks of the Susquehanna in Pennsylvania. It is a great favorite wherever known. Fruit of the largest size, sometimes measuring twelve inches in circumference. The best of all the yellow fleshed peaches. Free-stone.

49. HEATH.—Heath Cling, Red Heath, Fine Heath, White Heath.*—*Coxe, Down*.

The most superb and most delicious of all late Cling-stones. It will not ripen in New England, but all through the Middle and Southern States, it is one of the most marketable and valuable kinds, of very large size, *and the very finest flavor*.

Mr. Coxe informs us that this is a seedling produced in Maryland from a stone brought by Mr. Daniel Heath from the Mediterranean, and it is still frequently propagated from the stone *without variation* in that state. The tree is vigorous, long lived and moderately productive. With the *shortening-in* mode of pruning, the fruit is always large and very fine, otherwise it often becomes rather poor. This tree is placed by espalier, rail or wall at the North, and can be matured in that way.

Leaves nearly smooth on the edges, with reniform glands. Fruit very large, oblong, narrowing to both ends, and terminating at the top with a large swollen point; the suture distinct on one side; skin downy, cream-colored white, with a faint blush or tinge of red in the sun, or a brownish cheek;

* At the Hermitage Nurseries, Richmond, this is called the White Heath.

flesh greenish white, very tender and melting, exceedingly juicy, with the richest, highest, and most luscious flavor, surpassed by no other variety. It adheres closely to the stone. It ripens in September and October, and frequently keeps a month after being gathered. Flowers small.

50. MONSTROUS PAVIE.—*Bon., Jard., Lelicur, Thomp., Coles, Down.*

This is an old French variety of many names. It is not esteemed at the North except on account of its size. It will not ripen north of Philadelphia unless protected by walls, and is especially a southern fruit. This is perhaps synonymous with the *Monstrous Cling* of the West. It is a *very late* peach, of good flavor in the South, but rather coarse and wanting flavor at the North. Its extremely large size and showy appearance render it quite salable.

Leaves with reniform glands; fruit extremely large, roundish, oval, with a well marked suture extending to the top, and terminating there in an obtuse swollen point; skin yellowish white, a good deal covered with the broad very deep red color of its cheek; flesh firm, yellowish white, deep red at the stone, to which it adheres very firmly, and which is very small. Juicy, good flavor, beautiful; flowers large. No amateur peach grower should fail to procure this variety for his orchard or garden. This splendid peach matures the last of October in the Middle States; middle of October in Virginia and North Carolina, and is especially adapted to the southern part of the Western States and farther South.

51. LARGE WHITE CLING.—*Floy. Down.*

This is the most popular cling-stone peach of the North—said to be superior in that climate to the Catharine and Old Newington, and only inferior in flavor to the Heath and Old Mixon Clings. It is a native of New York, and was first introduced by Floy as the New York Cling-stone. This is the great favorite for preserving in brandy or sugar. The tree is said to be remarkably hardy and long lived and seldom attacked by the Yellows.

Leaves with globose glands; fruit large, round; the suture slight, and the swollen point at the top small; skin white, in-

clining to yellow only when over ripe; dotted with red on the sunny side, or with a light red cheek when fully exposed; flesh whitish, tender, very melting, full of juice, which is very sweet, luscious, and high flavored; flowers small. Beginning and middle of September.

52. LEMON CLING.—*Floy. Thompson. Down. Kennedy's South Carolina. Pom Man. Long Pine Apple Cling. Coxe. Pine Apple. Yellow Pine Apple.*

This is the largest of all the yellow fleshed Clings. It is also the finest and most beautiful of this class. It is a native of South Carolina, and was brought to New York by Mr. Kennedy before the war of the Revolution. There are many seedlings in all parts of the country from this fine variety, but none superior to the original. The tree is a free grower, very hardy and productive.

Leaves very long with reniform glands. Fruit large, oblong, narrowed at the top, and having a large projecting, swollen point, much like that of a lemon; skin fine yellow, with a dark brownish red cheek; flesh firm, yellow, slightly red at the stone, adhering firmly, with a rich and sprightly vinous subacid flavor; flowers small. September.

53. OLD MIXON CLING-STONE.—*Coxe. Down. Coles. Green Catharine of the Americans. Thomp.*

One of the highest flavored and most valuable of all peaches known in this country, where it is raised in perfection, and should have a place in every orchard and garden. One of the best American authors says, "*We consider this, the Large White Cling, and the Heath Cling, and the Lemon Cling, as including all that are valuable for small collections. This fruit is quite distinct from the Catharine Cling of Europe, or the Old Newington, as a single glance at its leaf glands will show, to say nothing of its superior flavor. It can scarcely be the 'Green Catharine of the Americans' of the London Horticultural Society's Catalogue, as that is said to be a poor fruit. We are not familiar with it.*" Coxe says that the Old Mixon Cling was introduced by Sir John Old Mixon, from Europe. It is more probable that he introduced the stone only.

Leaves with globose glands; large yellowish-white, dotted with red on a beautiful red cheek; flesh pale white, very melting and juicy, with an exceeding rich, luscious flavor, one of the highest flavored and most valuable peaches cultivated; flowers small. Last of August.

54. RED MAGDALEN.—Large, round and regular, pale yellowish green with rich red cheek, firm, melting, juicy, and high flavored; an excellent variety. Cling. August.

55. CHINESE CLING.—Fruit large, roundish oval; skin transparent, cream color, with marbling of red next the sun; flesh creamy white, very juicy and melting, with a rich and very agreeable flavor, every orchard should have a few of this variety.

56. NEWINGTON, Cling, (English).—One of the best early Cling-Stone peaches.

57. TIPPECANOE.—Very large, yellow, with red cheek, juicy and rich—nearly round with a point; broad cheek, flesh yellow, of a fine vinous flavor. Rather late for the Northern States; fine in the South and South-west; excellent for the table and of superior quality for preserves. Tree vigorous and a great bearer. Reniform glands, small flowers. Matures in the Middle States from the first to middle of October. Farther South first of October.

58. BRENNEMAN CLING.—Large; skin yellow, with considerable red on the sunny side; flesh yellow, juicy sweet, and high flavored; very valuable. September.

59. GRAND ADMIRABLE.—Full medium size; skin white, nearly covered with red; this is a very nice and good peach, and is an early cling. August.

60. SMITH'S NEWINGTON.—*Lind. Thomp. Down.* Early Newington—Smith's Early Newington of the *English*. Early Newington—*Coxe*.

This fine, early cling-stone peach, is of English origin. It is one of the very best early clings. The Early Newington of our orchards is a splendid *free-stone* (or rather it adheres partially to the stone); it has in a measure supplanted this cling-stone. It is also much earlier.

Leaves serrated, without glands; fruit rather above middle

size, oval, narrow at the top, and one half a little enlarged; skin, pale straw color, with a lively red cheek streaked with purple; flesh firm, pale yellow, but light red at the stone, to which it adheres closely; juicy and of fine quality. Middle of August

61. CATHARINE.—*Long. Lind. P. Mag. Thomp. Down.*

This is an excellent English variety. Some authors have remarked that this cling cannot be distinguished from the Old Newington, (Smith's) and Old Mixon Cling. But they are distinct varieties, as may be known by the glands of the leaves, which, unerringly, distinguish all varieties. Leaves with reniform glands; fruit large, roundish, oval; skin pale yellowish green, sprinkled with red dots; flesh yellowish white, dark red at the stone; cheek bright lively red. Middle of Sept.

62. ORANGE CLING.—Large, handsome, excellent; resembles the Lemon Cling, but richer in flavor and quite a distinct fruit.

Leaves serrated, without glands; fruit large, round; skin deep orange with rich dark red cheek; flesh deep or dark yellow, rather firm, juicy with a delicious, vinous flavor; small flowers. Early in September.

CLASS IV.—*Varieties partially adhering to the stone.*

63. EARLY TILLOTSON.—This fine early variety which we have already described as a free-stone, is properly of this class. All who wish a fine early peach should cultivate this variety. July.

64. EARLY NEWINGTON, (of the Americans) Newington peach. *Down.*

This is a large and exceedingly high flavored peach; indeed we consider it without a superior at the season of its maturity, which is about the first of August. It is distinct from the other Newingtons, which are perfect clings and much later. If not fully ripe, it adheres to the stone—although it is classed by most authors with free-stone peaches. This partial adhesion is a very distinguishing character of this variety. Leaves with reniform glands; fruit large, round, one half the

fruit always larger ; skin pale, yellowish white, streaked with red, rich red cheek ; flesh white, red at the stone ; rich vinous and juicy.

65. WASHINGTON.—Washington Red Free-stone.—*Floy. Ken. Down.*

This is a very handsome and delicious peach ; originated in New York about seventy years ago. The tree is vigorous, hardy and very productive, and it is altogether a most valuable fruit.

Fruit large and broad, somewhat depressed, suture deep, globose glands ; thin yellowish white skin, with a beautiful deep crimson cheek ; flesh pale, rather yellowish, tender, juicy and melting, with a sweet, very rich and luscious flavor. It *adheres considerably to the stone*, slightly so when very ripe, stone very small ; flowers small. Season first of Sept.

66. ATLANTA, New.—Originated by Dr. E. Ware Sylvester, of Lyons, Wayne Co., New York. Fruit, according to Elliott, of medium to large size ; skin white, with a dark, almost purplish red cheek ; flesh white, juicy, rich, adhering slightly to the stone, of excellent, almost best quality.

CLASS V.—*Varieties producing the same from the seed.*

67. WHITE BLOSSOMED INCOMPARABLE.—P. Man. Thomp. Down. *White Blossomed.*

This is an American fruit, quality not quite so fine as the Snow Peach, which it resembles. *The seeds produce the same variety.* The flowers are very white, and the leaves very light green, with reniform glands, wood, pale yellow ; fruit quite large, rather oval ; skin fair, clear, white throughout ; flesh perfectly white to the stone, melting, juicy, very sweet and pleasant ; flowers large. Matures last of August.

68. HATCH.—Coles.

This very large, fine, free-stone peach (already described) produces the same from the seed. "We have hundreds of seedlings (we quote Coles) perfectly uniform.

69. BRIGGS.—(Coles.)

Large, flatish round ; suture nearly all round, white, nearly

covered with white red; flesh white, tinged with red at the stone; very juicy, of a rich, sweet, slightly vinous flavor; hardy. Has produced its like from the seed for twenty years. Last of August. (We consider this a valuable variety that does not require the delay and trouble of grafting.)

70. HALE'S MELOCOTON.—Large, medicinal, oblong, flat at the base, slight suture on one side; bright yellow; flesh yellow, of a very sweet and excellent quality. Keeps well; free-stone; matures last of August. Produces the same from the seed.

71. ALLEN'S WALPOLE MELOCOTON.—Allen's Walpole. Allens.

Small, roundish, white, red cheek, flesh white, very juicy, of pleasant vinous flavor; hardy and a great bearer. Has been raised for forty years from the seed uniformly true.

72. TUFT'S RABERIPE.—(Coles.)

This valuable free-stone peach (already described) produces invariably the same from the seed.

73. BATCHELDER.—(Coles.)

Large, round, white, with a deep blush; flesh white, melting, juicy, very pleasant, rich, vinous flavor. Should be well ripened on the tree; very hardy; produces crops when many others fail; reproduces itself uniformly from the seed. We have young trees all uniform and the same as the parents. (Our authority for this is Mr. Coles of the American Fruit Book.)

74. HEATH CLING.—*White Heath Cling, White English, Eliza Thomas, White Globe, Henrietta, etc., etc.*

This is the most delicious and superb of all seedlings, (already described.) It is a native of Maryland from seed brought from the Mediterranean. It is still propagated from the stone, generally with undeviating sameness, which renders the tree more hardy and durable than if grafted, and adds greatly to the value of this splendid fruit.

75. COLUMBIA.—Coxe. (Already described.)

This fine yellow free-stone peach was originated by Mr. Coxe, from a seed brought from Georgia. In consequence of its rough and thick skin, it is rather too much for the curculio,

and is in a great degree exempt from his depredations. Its value is also greatly enhanced from the fact that it is one of the best varieties that reproduces itself invariably from the seed.

76. LEMON CLING.—Synonym. *Pine Apple, Kennedy's Caroline, Early L. Cling.*

This is a native of South Carolina, and the finest, most beautiful and largest of all yellow fleshed clings. Reproduces the same from seed.

77. OLD MIXON CLING.—This is one of the finest and highest flavored of all white flushed peaches known in this country. Always the same from the seed.

78. HARTSHORN.—Coles.

Large, roundish, oval; rich, yellow, deep blush; flesh has a peculiar coarse grain, that fits it admirably for preserves. Saccharine and pleasant; produces the same from the seed; from first to middle October.

BLOOD PEACHES.

79. BLOOD CLING.—Floy. Down.

An extremely large and peculiar fruit, much esteemed for pickling and preserving, to which it is well adapted. Flesh

NOTE.—“The Heath (says Mr. H. C. Williams, of Falls Church, Fairfax county, Va.) has been in my father's family for more than seventy years, grown all the time from the seed. There are other varieties of peaches, such as the Columbia, Old Mixon Cling, etc., whose individual character is so strongly impressed upon them that they appear to refuse a union with others, and hence they will almost invariably, or in a great majority of cases, reproduce themselves from their own kernels.

In Georgia, Tennessee and Arkansas, the Heath is called the “*English Peach*,” from the circumstance that Col. Hamilton, who is mentioned in Lee's memoirs as an officer in the Revolutionary war, and afterwards Consul at Norfolk, having brought stones of this peach from Scotland, distributed them among his old neighbors in Caswell or Person county, North Carolina, where he had been a merchant previous to the war.

Cox ascribes the introduction of this peach from the Mediterranean to a Mr. Heath. The two peaches are identically the same, and its constant habit of reproducing itself without variation, proves its universal popularity, and tends to confirm the history of its appearance in this country at two points remote from each other. A Heath seedling makes the best stock for budding of any of our fine varieties.”

very red, like that of the beet; skin very downy, and of a dark gray or purplish color; very firm and juicy, adheres closely to the stone; tree vigorous and grows fast and large; leaves very large with reniform glands; flowers small; fruit sub-acid, keeps well; early in September. This is an American seedling raised many years ago from the French Blood Cling-Stone or Claret.

80. BLOOD FREE-STONE.—This is a French variety, nearly of the same flower and description of the Blood Cling. It is pleasant, sub-acid and very juicy, better to eat than the Cling, and is used for the same purposes. Matures about the first or middle of September. The leaves have no glands.

81. INDIAN BLOOD.—Large, dark claret, with deep red veins, downy, flesh deep red, very juicy, vinous and refreshing. Middle August, in Ga. Originated in the South.

DWARF PEACHES.

82. ITALIAN DWARF.—(Hermitage, Richmond Nurseries.)

Medium size, whitish green, rich and juicy; bears early, and reaches the height of five feet. It is both ornamental and useful; free-stone. August.

83. VAN BUREN AND GOLDEN DWARF.—Hermitage and Richmond Nurseries.

Fruit large, yellow skin, with red cheek, flesh yellow, sub-acid and fair quality; foliage dense and pretty; cling-stone. August. Generally grows to the height of four or five feet.

CURIOUS AND ORNAMENTAL VARIETIES.

84. THE DOUBLE BLOSSOMED.—Thomp. Double Flowering Peach, Bon. Jard. Rose Flowering, O. Duk. Down.

The Double Blossomed peach, when in full bloom, is a gay and very beautiful tree. The great profusion of large showy flowers, resembling small roses, is a most lovely and exquisitely beautiful sight; and should be placed beside the Double Flowering Cherry, as a gay rival, in all pleasure grounds and ornamental gardens. The blossoms of this peach are at least three times the size of the common peach, of a brilliant rose

color, "nearly full double," and so thickly spread on the branches as to exhibit their blushing loveliness to the greatest advantage.

The tree blooms at the usual season. Some prefer budding this variety on the Mirabelle or the Cherry Plum stock, in order to render it more dwarf.

85. WEEPING PEACH.—Reed's Weeping Peach. Down.

This singular, pendant, weeping variety, whose branches very much resemble the weeping ash, was originated near New York City. In order to display it to advantage it is best to graft it, six or eight feet high, on the clean stem of a peach or plum stock. The leaves have reniform glands, and flowers very large.

86. PYRAMIDICAL.—Grows to a height of twenty feet in a compact form, like the Lombardy Poplar. This is highly ornamental.

87. VAN BUREN'S DWARF.—Somewhat in the style of the Italian Dwarf. Fruit yellow, cling, very pretty and useful.

88. FLAT PEACH OF CHINA.—Lind. Thomp. Down.

The Flat Peach of China, "is more curious than beautiful." It is a very singular variety with small fruit, about two inches in diameter, and so flattened at the ends that only the skin and the flat stone remain, the fleshy part being crowded on either side. The tree is rather dwarfish, and the leaves remain very late. The fruit is of good flavor and is desirable in the gardens of the amateur and the curious. This peach is sometimes called "*China Peach, Jarva Peach, Peen To.*"

Leaves with reniform glands; fruit small, flattened so much as to form a deep hollow at both ends; having at the top a singular, broad, rough, fine angled eye. Skin pale yellowish green, mottled with red on one side. Flesh pale yellow, with a circle of red round the stone, (from which it separates), sweet, juicy, with a slight noyau flavor. Last of August. Flowers large.

The two dwarfs, just described, are also highly ornamental, and should adorn the gardens and orchards of the curious. These, however, are really useful as well as ornamental.

NEW VARIETIES—IN 1869.

Mr. Elliott, of Ohio, who is high authority in peach culture, says, "Of new varieties of American or foreign origin, I learn only of the following as especially worthy of record:"

89. PRINCE OF WALES.—A seedling, grown by Thos. Rivers, England, from the seed of the Pitmaston Orange Nectarine, and has this year fruited in this country by James H. Ricketts, of Newburgh, New York, an enterprising and enthusiastic fruit cultivator. The tree is a fine grower; fruit of medium size; free-stone; ripe early in September (in New York).

90. PRINCESS OF WALES.—This is also a seedling, by Thos. Rivers, England. Grown from the seed of *Pavie de Pompone*, and, like the Prince of Wales, has been first fruited in this country by Mr. Ricketts. The tree is a free grower; the fruit is of full medium size, often almost large; flesh white; free-stone; ripens last of September.

91. SALWAY.—This is another foreign variety that, although not specially new, appears to have characteristics to make it a valuable market variety. The tree is a vigorous grower. In size, the fruit is large or very large; the flesh orange color; free-stone; matures very late, even into the middle of October; hence, taken with its extra size and high color, it promises a valuable sort for marketing in the South and West.

92. RICHMOND.—Fruit large, skin yellow and red, free-stone, and promising of value for market. Propagated by Dr. E. W. Sylvester, of New York. The fruit has less acid than Crawford's Early.

93. ATLANTA.—Fruit of medium to large size; skin white, with a dark, almost purple-red cheek; flesh white, adhering slightly to the stone. Of excellent and almost best quality.

94. FOSTER.—Originated near Boston—has not been figured or described, although it has received premiums. It somewhat resembles Crawford's Late, but (at the North) considered a better fruit, and ripens about the same time.

NOTE.—All the above new fruits are figured and more fully described in that excellent periodical, "The American Horticultural Annual," Orange Judd & Co., New York city. 1870.

SOUTHERN AND WESTERN PEACHES — REVISED CATALOGUE.

Selected from the Catalogue of the Committee of Revision, presented and accepted at the meeting of the American Pomological Society, held at Richmond, Va., in September, 1871.

NAMES.	DESCRIPTION.						Embracing Cen. Div. bet. 35° and 42°, and South Div. bet. 28° & 35°.																	
	Size.	Class.	Color.	Quarterly.	Glands.	Season.	Origin.	Maryland.	Virginia.	W. Virginia.	N. Carolina.	S. Carolina.	Georgia.	Alabama.	Florida.	Arkansas.	Mississippi.	Louisiana.	Texas.	Tennessee.	Kentucky.	Missouri.	California.	
*Amelia.....	1	F.	w	m. j. r.	r	E.	Am	..	..	..	..	..	..	..			
Baldwin's Late....	1	F.	w	j. m.	r	L.	"	..	..	..	..	..	..	..			
†Chinese Cling....	m	F.	y	j. v.	r	M.	"	..	..	..	..	..	..	..			
Cole's Early Red...	m	F.	w	m. j. r.	g	V E	"	..	..	..	..	..	..	..										∞
Crawford's Early..	1	F.	y	j. v.	r	M.	"	..	..	..	..	..	..	..			
Crawford's Late....	1	F.	y	j. v.	g	L.	"	..	..	..	..	..	..	..			
Druid Hill.....	1	F.	g	m. j. r.	r	V L	"	..	..	..	..	..	..	..			
Early Filotson....	m	F.	g	m. j. r.	g	V E	"	..	..	..	..	..	..	..			
Eaton's Golden....	m	C.	y	s. j.	r	L.	"	..	..	..	..	..	..	∞		∞		
Geo. the Fourth...	m	F.	y	m. j. r.	g	M.	"	..	..	..	..	..	..	∞										∞
Grosse Mignonne...	1	F.	w	s. j. h.	g	M.	"	..	..	..	..	..	..	∞										∞
Hale's Early.....	m	F.	w	m. j. r.	r	V E	"	..	..	..	..	..	..	∞										∞
Heath Cling.....	1	C.	g	s. j. h.	..	V L	"	..	..	..	..	..	..	∞										∞
Ind. Blood Cling..	1	C.	y	j. v.	r	L.	"	..	..	..	..	..	..	∞										∞
Lady Parham.....	m	F.	g	j. v.	r	V L	"	..	..	..	..	..	..	∞										∞
Large Early York.	m	F.	w	s. j. h.	g	V E	"	..	..	..	..	..	..	∞										∞
Lemon Cling.....	1	C.	y	j. v.	r	L.	"	..	..	..	..	..	..	∞										∞
Morris' White.....	m	F.	w	m. j. r.	r	M.	"	..	..	..	..	..	..	∞										∞
Old Mixon Free...	1	F.	g	s. j. h.	g	M.	"	..	..	..	..	..	..	∞										∞
Old Mixon Cling..	1	C.	w	m. j. r.	r	M.	"	..	..	..	..	..	..	∞										∞
Smock.....	1	F.	y	j. v.	r	L.	"	..	..	..	..	..	..	∞										∞
Susquehanna.....	1	F.	y	s. j. v.	g	M.	"	..	..	..	..	..	..	∞										∞
Stump the World..	1	F.	w	s. j. h.	g	L.	"	..	..	..	..	..	..	∞										∞
Yellow Rareripec..	1	F.	y	j. v.	r	E.	"	..	..	..	..	..	..	∞										∞
Yellow St. John...	1	F.	y	s. j.	g	V E	"	..	..	..	..	..	..	∞										∞

The columns explain : SIZE 1, large ; m., medium ; s., small. CLASS, F., freestone ; C., clingstone. COLOR, relative to flesh, w., white or pale colored ; y., yellow or yellowish ; g., greenish white, red at the stone. QUALITY, m. j. r., melting, juicy, rich ; s. j., sweet and juicy ; s. j. h., sweet, juicy, and high flavored. GLANDS—s., serrated without glands ; g., glands globose ; v., glands reniform. SEASON—those designated as early, ripen in latitude 43°, previous to or about Sept. 1st ; medium, those ripening from the 1st. to the 15th. of Sept., and late those after period ; E., early ; M. medium ; L., late ; V. E., very early ; V. L., very late. ORIGIN—Am. American, F. Foreign. One * or ° designates recommended, two ** or ∞ gives the character or superiority for family and market use.

* This originated in South Carolina, and differs from the Missouri Amelia.

† Berchmans thinks it is the same as Shanghae.

NEW FOREIGN VARIETIES—*Highly Recommended.*

Belle Beauce,	Early Silvers,
Belle Couquete,	Early Victoria (<i>Rivers</i>),
Belle Done,	Pucelle de Malines,
Chevreuse Hative,	Raymackers,
Early Albert (<i>Rivers</i>),	Vineouse.

SELECT CATALOGUES OF VARIETIES.

Having arranged the nomenclature and description of the various sorts and modifications of the best known varieties of the peach, it also becomes necessary to furnish the orchardist with catalogues, suitable not only for the different purposes to which the fruit may be applied, or used, but also to furnish lists adapted to the different *soils and climates* most congenial to the growth of the tree and the development of its fruit. This we have taken much pains to accomplish, and hope we have succeeded in a manner that will be considered both judicious and appropriate.

The elements of a good peach list, says a modern author, should combine only a few varieties of the most hardy, healthy, handsome, good, large, portable peaches—ripening in succession from the first of July to the middle of October—extending in succession some four months.

In accordance with these views we present the following list of the best varieties for *general cultivation, for market and home consumption*, throughout the South and Southwestern States, as well as portions of the Western States, which, according to the best of our judgment and information, are comprised in the following list. By a proper selection from this list, the peach season may be extended from the first of July to the middle of October; and, when the *Heath Cling* and Baldwin's October, as late varieties, are selected, which keep in a good state of preservation a month after gathering, nearly *five months* may be counted for the duration of the peach season.

VARIETIES SUITABLE FOR GENERAL CULTIVATION.*

- Early Tillotson and Hale's Early; early in July.
 Froth's Early and Malta; middle of July.
 Honey peach; early in July—June, in South Carolina.
 Yellow Rareripe and Early York; last of July.
 Anna Ruffin; July.
 Large Early York and Royal George; first of August.
 George the Fourth; August.
 Columbia, or Georgia peach; middle to last of August.
 Snow peach, Late Admirable, and Heath Free-stone; last
 of August.
 Chinese Cling and Crawford's Early; August.
 Susquehanna; August and September.
 Druid Hill; First of September.
 Old Mixon Cling; September.
 Old Mixon Free and Morris' White; first of September.
 Lemon Cling; middle of September, South Carolina.
 Red Cheeked Melocoton; September.
 Ward's Late; middle of September.
 Grosse Mignonne or Royal Kensington; first of Sept.
 Crawford's Late; September.
 Coolridge's Favorite and George the Fourth; first Sept.
 Monstrous Pavié—late (Southern States).
 Noblesse and Morris' Red Rareripe; September.
 Smock's Free-stone; last of September.
 Heath Cling; first of October.
 Eaton's Golden Cling, Lagrange, Tippacanoë, Blood Cling,
 and Henrick's Heath; October.
 Parker's Late; 10th October (cling).
 Baldwin's October.

*Although this list may approximate as near as any that could be made for general cultivation in the South, yet we are aware that no such list can succeed *generally* throughout even this State (Virginia). Varieties that are best in the Piedmont and Western portion will not succeed in Tide-water Virginia, and *vice versa*. There must be special lists for the different localities, as it regards the peach—and the same may be said of the Summer and early Fall apples.

SELECT PEACHES ADAPTED TO THE CLIMATES OF
MARYLAND, VIRGINIA, WEST VIRGINIA AND N.
CAROLINA, FOR A SUCCESSION.

Hale's Early,	Washington,
Fay's Early Ann,	Old Mixon Cling,
Crawford's Early,	Ward's Late,
Early Tillotson,	Crawford's Late,
Red Rareripec,	Susquehanna,
Yellow Rareripec,	White Heath Cling (for pre-
Morris' White (preserving),	serves),
Grosse Mignonne,	White Magdalen,
George the IV., similar to	Red Magdalen,
Large Early York.	Jeweler,
Columbia (Georgia peach, In-	Alberge's Yellow,
dian peach),	Old Mixon Free,
Snow Peach,	Red Cheeked Melocoton,
Smock's Free,	Lagrange,
Lemon Cling, S. S. (beautiful	Eaton's Golden Cling,
blossoms and fruit), <i>Ken-</i>	Heath Cling,
<i>nedy's Cling,</i>	Baldwin's October.

SELECT PEACHES FOR MARKET, ADAPTED TO THE
LATITUDE OF MARYLAND, VIRGINIA, &c.

Large Early York,	Henrick's Heath,
Haine's Early,	Old Mixon Free,
Druid Hill,	Smock, or St. George,
Lemon Cling — <i>Kennedy's</i>	Heath Cling,
<i>Cling,</i>	Old Mixon Cling,
Fay's Early Ann,	Early and Late Crawford,
Morris' Red Rareripec,	Yellow Rareripec,
George the IV.,	Lagrange,
Columbia,	Baldwin's October (Georgia).

We are indebted to Messrs. Harris & Wallis, of the Coves-

NOTE.—For market purposes, large, high-colored fruits bring the highest prices. Clings are not so well adapted to distant markets.

ville Nurseries, Albemarle County, Va., for valuable aid in arranging these lists. They can furnish all the varieties of peaches, as well as apples.

SELECT PEACHES, ADAPTED TO THE STATES SOUTH OF NORTH CAROLINA.

- Heath Cling, Monstrous Pavie.
 Blood Cling (pickling and preserving).
 Kennedy's Cling, South Carolina.
 Blood Free-stone, Fr. (*Sanguinole*, *Sanguine*).
 Old Mixon Cling, White Cling (large).
 Orange Cling, large, deep orange, excellent.
 Late Admirable (*Teton de Venus*).
 Lemon Cling (native of South Carolina).
 Columbia—Indian, or Georgia peach (market).
 Grosse Mignonne (origin France).
 George the IV., Early Tillotson (market).
 Early Ann (English), very early.
 Druid Hill (market), Bellegarde, Walters' Early.
 Morris' Red Rareripec, Morris' White (White Rareripec).
 Lagrange, Honey Peach (origin S. C.), very valuable.
 Jacque's Rareripec (yellow), Smock Free.
 Walburton Admirable (late English).
 Late Heath, free; White Melocoton.

* Pace, or Tinsley (seedling), often 13 inches circumference;
 Baldwin's October, free; October to middle of November.

Snow Peach, Dulany (a seedling from the Heath).

Hunter; September. (Shape and size of large Early York.)

*These are fine Georgia peaches, and are extensively cultivated near Clarksville, Habersham county, in place of Northern varieties. The first is a magnificent fruit, often weighing over a pound. The second is also a native seedling, ripening its fruit from the last of October to middle of November, with the unusual property of keeping sound until December. (These fruits are worthy of general cultivation.) No region of country upon the globe can exceed Georgia and portions of Mississippi in the perfection of their peaches. The burning sun developing the fine saccharine qualities of this delicious fruit to the highest degree. Even the yellow-fleshed varieties are sweet and savory, with only so much acid as to be grateful to the taste. Early peaches from South Carolina and Georgia may be put in Northern markets at least four weeks earlier than from their own orchards, as the peach ripens in the middle portions of these States by the 10th of June.

Clark's Early (originated near St. Louis).
 St. Louis—a large native yellow peach (market).
 Walter's Early, Cole's Early, pale fleshed free-stones.
 Old Mixon Free (pale fleshed).
 Lagrange, President.
 George the IV. (market).
 Morris' Red Rareripec (market).
 Royal Kensington, Bergen's Yellow, Troth's Early,
 Yellow Rareripec, Chinese Cling, Crawford's Late,
 Early Chelmsford, Susquehanna,
 Coolridge's Favorite,
 Crawford's Early, Catawba,
 Lady Parham, Iron House,
 Van Zandt's Superb, Bradford's Free, Noblesse,
 Cromwell's Yellow, Large White English Cling,
 Grand Turk, Deleis Cling, Eaton's Golden Cling,
 Nix's Late, Cox's October.

SELECT PEACHES FOR MARKET, ADAPTED TO EXTREME SOUTHERN LATITUDES.*

Early Tillotson,	Honey Peach,
Early York,	Columbia,
Early Ann,	Kennedy's Cling,
Walter's Early,	Pace, or Tinsley,
Druid Hill,	Snow Peach,
Old Mixon Free,	Morris' Red Rareripec,
George the IV.,	Heath Cling,
Lemon Cling,	Baldwin's October,
Smock Free,	Nix's Late,
Iron House,	Lady Parham.
Chinese Cling,	

*As far south as Florida the peach tree is long-lived, healthy and vigorous, and is never subject to injuries from the *peach worm*, or the diseases which so universally afflict the fruit in the Northern and Western States. The most delicious peaches may be raised almost without care, by every family, and in abundance sufficient even for the economical feeding of swine. The earliest varieties of this fruit ripening in the beginning of June, and the latest sorts continue until late in August. The earliest and the latest varieties should be chosen for cultivation in Florida, as the rainy season commences in July and continues throughout that month, causing much of the maturing fruit to crack.

CHOICE PEACHES FOR A GARDEN OR SMALL OR-
CHARD, FOR GENERAL CULTIVATION AND FOR
A SUCCESSION.

Early Tillotson,	Early Yellow Rareripe,
Hale's Early,	Delce's Cling,
Early Newington,	Morris' Red Rareripe,
Royal George,	President,
Crawford's Early,	Lemon Cling,
Noblesse,	Crawford's Late,
Royal Kensington,	Columbia,
Tippecanoe,	Heath Cling,
Old Mixon Free,	Baldwin's October,
Morris' White,	Nix's Late.

W. C. Flagg, of Illinois, in an essay on peaches, says that from his experience and observation the variety with the fewest objections is the *Old Mixon Freestone*; and that for a list of four market varieties which will nearly cover the season, and against which few objections can be urged, he names:

Troth's Early,	Old Mixon Freestone,
Large Early York,	Smock Freestone.

BARRY recommends for a succession from August 1st to October, in eastern and western latitudes:

Early Tillotson,	Crawford's Early,
Early York,	Jacques,
Haines' Early Red,	White Imperial,
Coolridge,	Lemon Clingstone,
Yellow Alberge,	Large White Clingstone.

THE ELMWOOD LIST FOR CULTIVATION SOUTH.

The following valuable list, prepared by Mr. Jas. Stewart, of the Elmwood Nurseries, Memphis, Tennessee, may be relied on, to *run through the season*, as among the best and most profitable for the orchardists of that section:

EARLY TILLOTSON.—The finest and most profitable of all

the early peaches. You can, for shipment, gather the entire crop on the last of June.

EARLY YORK.—Somewhat larger than the Tillotson. It can be shipped on the 10th of July, and be eaten for fifteen days longer.

IRON HOUSE.—Can be shipped on the 15th of July, and in eating for ten days longer. This tree originated with the late Wm. Armour, in middle Tennessee. It was planted by his iron house—hence its name. It is large, dark yellow color, of the highest excellence, both in flavor and appearance. It is regarded as the finest of all that class of peaches of its season.

MORRIS' RED.—Well known, and good everywhere.

VAN ZANDT'S SUPERB.

BRADFORD'S FREE.

EARLY NEWINGTON.

NOBLESSE.

GEORGE THE FOURTH.—All first class fruits here.

CHINESE CLING.—This can be shipped on the 20th July, and in eating the 1st of August. I regard this as the finest I have ever seen globe. Size, very large; color, light green, marbled and streaked with red; flavor surpassingly grand. Leaves, habit and growth, very distinct. For profit or any other purpose, this fruit, in our climate, leaves all others in the shade.

OLD MIXON CLING.—Is ready for shipping by the 1st of August. This old variety will ever be popular; it is one of the very best peaches of its season.

CROMWELL'S YELLOW,

GROSSE MIGNONNE,

CRAWFORD'S LATE,

BUCKNER'S RED,

FLEWELLEN,

STUMP THE WORLD,

RODMAN'S CLING,

RED MAGDELENE,

Each a favorite.

MORRIS' WHITE.—This is truly a noble variety; color creamy white; very large, and in general appearance very attractive. In shipping order the 1st of August.

LARGE WHITE ENGLISH CLING.—A distinct peach of great

excellence, and, in every way as desirable as the above for any purpose.

DRUID HILL.—In shipping order the middle of August. This, though not as fine in appearance, is nevertheless one, if not the very finest of its season.

LATE ADMIRABLE.

LEMON CLING.

GRAND TURK.—This splendid peach originated ten miles south of Memphis. Large, and of very dark blood color; skin beautifully marbled with green.

DELCE'S CLING.—In shipping order on the 25th of August. This fine variety originated with Major Bradford, of Brownsville, Tennessee; in appearance and quality it resembles the famous and well known *White Cling Heath*—good every where.

WHITE CLING HEATH.—This comes in order about the 1st of September. It is so universally known I need say nothing about it.

LAGRANGE.—Regarded here as one of our very best; ripening about the 15th of September. A most magnificent variety for shipping, and beautiful appearance in market. In color and appearance it is about the same as the Heath tribe.

EATON'S GOLDEN CLING.—For a change in color, we now add Eaton's Golden Cling; a most beautiful golden yellow, ripening about the same time with the Lagrange.

LADY PARHAM.—Latter end of September; very excellent.

NIX'S LATE.—Matures about the 10th of October. Quality the very best. "Both the latter varieties resemble the Heath, and are the very best to run you through the entire season, and wind up the list. The above is the result of long experience and close observation. As they have fruited, grown, matured, and proved themselves with me, so they are here briefly described to you."

"Any one planting this succession may rest assured that they will not be disappointed, although I must say there are other varieties which, for amateur purposes, may be preferable. The Noblesse, for instance, an exceedingly tender and most deliciously flavored fruit, is, by many, esteemed the most

luscious and excellent of all peaches. Also, the Grosse Mignonne is hardly surpassed in this latitude, though not so attractive in appearance."

It is well to recollect that situation, climate, latitude, soil, and even circumstances, have something to do in the production of the high qualities of this delicious fruit which is at home in the uplands of all southern countries.

BERKMANS' LIST—AUGUSTA, GEORGIA.

The following *select list* was furnished us by Mr. P. J. Berkman, Augusta, Georgia. We consider it very valuable for that region, and well adapted to other southern latitudes:

FREESTONES.

AMELIA.—Synonyms, Stroman's Carolina, Orangeburg, Rayzers, June, etc. Very large, conical, white, nearly covered with crimson; juicy and high flavored, vinous, sweet. It is too tender to stand long carriage; but as a peach for home consumption it is truly magnificent; July 1st to 10th.

BALDWIN'S LATE.—Large, oblong, greenish white, with red cheek; juicy and well flavored; October 10th.

BERGEN'S YELLOW.—Large, round, skin yellow, covered with dark red; flesh yellow; juicy, sweet, high flavored; July 10th.

COLUMBIA.—Synonyms, *Pace*, *Tinsley's Superb*, *St. Stephens*, *Yellow Indian*, etc.

CRAWFORD'S EARLY.—First of July.

CRAWFORD'S LATE.—Middle of July.

EARLY YORK, SERRATED.—End of June.

EARLY YORK (Large).—July 10th.

EARLY TILLOTSON.—June 15th to 25th.

GROSSE MIGNONNE.—Middle of July.

HALE'S EARLY.—Ripe specimens were gathered here on the 10th of June.

LATE ADMIRABLE.—Syn. *Teton de Venus*, etc. Ripe July 20th.

NOTE.—Mr. B. says, to prevent the attack of the *borer*, "hill up the trees in April and leave off again in November. If any eggs are by chance deposited, they can be easily destroyed."

LATE RARERIPE.—About 1st August.

LADY PARHAM.—Medium, skin greenish white, seldom with any red, flesh white, juicy, vinous, highly flavored; a first rate late variety. Beginning of October.

LAGRANGE.—Middle and end of August.

OLD MIXON FREE.—Middle to end of July.

OSCEOLA.—Large, golden yellow, with orange cheek, with a few red veins; flesh golden yellow, sweet, buttery, and with an apricot flavor; belonging to the Indian type. Beginning of September.

PICQUETT'S LATE.—Very large, yellow, with red cheek; flesh yellow, buttery, rich, sweet, and of the highest flavor. Originated by Antoine Picquett, Esq., Belair Georgia, and a most valuable acquisition. 1st Sept.

RED CHEEK MELOCOTON.—Ripe middle July.

STUMP THE WORLD.—Very large white, with bright red cheek; flesh white, juicy and of good flavor, stands carriage well and a fine market variety. July 20th and lasts three weeks.

SUSQUEHANNAH.—End of July.

TROTH'S EARLY.—Almost identical with Early Tillotson. Ripens three or four days later.

CLING STONES.

AUSTIN'S LATE RED.—Large, white, with red cheek, flesh white, juicy, vinous, and well flavored. Middle of October.

BAGBY'S.—Large, white juicy; tree of slender growth. Middle August.

BORDEAUX.—Large, yellow, with a faint red cheek, flesh yellow, rather coarse, but of good flavor, very showy. Ripe July 20th.

CHINESE.—Splendid in our climate.

DEMMING'S SEPTEMBER.—Large, oblong, with a protuberance, yellow, with red cheek; flesh yellow, red near the stone; juicy, vinous and excellent; resembles the Lemon Cling. Middle September.

ELMYRA.—Large, white, nearly covered with red; flesh white and red near the stone, juicy, good. July 15th.

EATON'S GOLDEN.—Medium, skin golden yellow, with occasionally a few pink spots; flesh yellow, sweet, juicy, with apricot flavor. Middle of September.

FLEWELLEN—Large, deep red, with deeper red veins; flesh red and juicy, vinous, very good; belongs to the Indian type; most beautiful and showy. July 20th.

HEATH RED.—Large, oblong, skin creamy white, with red wash, flesh juicy, vinous and well flavored, red near the stone. August 25th.

HEATH LATE WHITE.—Syn. *Heath*, (Coxe), *Heath Cling-Stone*, *Fine Heath*, *White English*, *Eliza Thomas*, *Patter's September*, *Rawy Peach*, *White Globe*, *Henriette*, etc., etc. September. Large, rich, superb.

INDIAN BLOOD.—Large, dark claret, with deep red veins; downy, flesh deep red, very juicy, vinous and refreshing. Middle of August.

NEWINGTON CLING.—Syn. *Old Newington Cling*, (Lang., Lind., Thomp.) *Newington*, (Parkenson.) *Large Newington*, (Coxe.) Flesh separates partially from the stone. This is a very large, handsome, and excellent old English peach; has been in cultivation some 200 years.

NIX'S LATE WHITE.—Large, oblong, white, slightly tinged with red, downy, flesh white, juicy, and of fair quality; *fine for preserving*. Middle to the end of October.

OLD MIXON CLING.—End of July.

PINE APPLE.—Syn. *Lemon Cling*, Kennedy's Carolina, Allison, Early Lemon Cling, etc., etc. Middle of August.

TINLEY'S OCTOBER.—Medium, white with a wash of red; flesh white, juicy, and of high flavor. Middle of October.

LIST FOR THE VICINITY OF ATHENS, GA.

An extensive peach-grower, near Athens, Georgia, at the request of the Editor of the "Athens Southern Cultivator," has furnished the following very valuable list of desirable peaches, suited to that locality, which, doubtless, will answer for many other portions of the South.

FREE-STONE.

Hale's Early, Early Tillotson, Troth's Early ; June.

Red Rareripe, Amelia ; July 1st to 10th.

Walter's Early, Washington Free, white, George the IV., Early Admirable, Yellow Rareripe, Crawford's Early, yellow ; 10th July to 20th.

Morris' White, White Imperial ; 20th to 30th July.

Green Catharine, Walter's Late, Old Mixon Free. Late Admirable, Heath Free, Brevoorts Morris, Bloodgood's L. Green, Chevreuse Tardine ; about 1st August.

Late Rareripe, Crawford's Late, Rose Hill Seedling, Stump the World ; about 1st August.

President, Pace, Ward's Late Free ; Last of August.

Lagrange, Picquett's Late, President Church, Smock ; September 1st to 10th.

Baugh, Edward's Late, Baldwin's October, Lady Parham ; about 12th October.

CLINGS.

Georgia Cling, Chinese ; July 15th.

Congress, Large White Cling, Old Mixon, Baltimore Rose Lemon Cling.

Tippecanoe Cling, Washington ; August 1st.

Donnahoo, Demming's September, Catawba, Eater's Golden Cling ; September.

Dabney's, Hulls' Athenian, Austin's Late Red, Gaither's, Late, Nix's Late ; October.

PRESIDENT ALLAN'S SELECT LIST.

The annexed list of first class fruit, furnished by request, expressly for this work, by J. M. Allan, President of the Virginia Horticultural and Pomological Society, and Horticultural editor of the "Southern Planter and Farmer," Richmond, Va., is very valuable. It is intended more particularly for the *Tide-water district* of Virginia, but will answer for many other sections.

Hale's Early, free-stone ; July and August.

NOTE.—The first twelve only, on the above list, should be selected for Northern merchants.

Troth's Early ; middle July.

Early York, free-stone ; July and August.

Early Newington ; August.

Alberge's Yellow, (Yellow Rareripe) ; July and August.

Crawford's Early, George the Fourth, Royal Hensington,
Red Rareripe, free-stones ; August.

Morris' White, free-stone ; August and Sept.

Crawford's Late, Old Mixon, Red Cheeked Melocoton,
Teton de Venus, free-stones, Tippecanoe, cling, Lemon Cling,
Ward's Late, Old Mixon Cling, President ; Sept.

White Heath Cling ; Sept. and October.

DWARF PEACHES.

Italian Dwarf, free-stone ; August.

Van Buren's Golden Dwarf, cling-stone ; Sept.

SELECT PEACHES FOR THE VALLEY OF VIRGINIA AND WEST VIRGINIA.

The order observed here constitute a valuable succession of sorts, from August to October, which are esteemed for all purposes.

Hale's Early ; first to middle of August.

Cole's Early Red, Early York, (serrate), Early Newington ;
middle of August.

Fay's Early Ann ; August.

George the IV., Grosse Mignonne, (English,) Coolidge's
Favorite, Troth's Early ; end of August.

Bergen's Yellow ; beginning of Sept.

Alberge Yellow, (Yellow Rareripe) ; early Sept.

Crawford's Early, Brevoort's Morris ; beginning of Sept.

Snow Peach ; beginning to middle Sept.

Jacques, Rareripe, Old Mixon, free-stone ; middle Sept.

Morris' White, Scott's Nonpareil, (New Jersey), Red Cheek-
ed Melocoton ; middle to end Sept.

Old Mixon Cling, Susquehanna, Stump the World, (New
Jersey) ; end of Sept.

Crawford's Late.

Crawford's Early,	White Heath Cling,
Crawford's Late,	Breckenridge,
Grand Admirable,	Heath Free,
Stump the World,	Grosse Mignonne,
Hale's Early,	Van Buren,
Cole's Early,	Golden Dwarf,
Early Tillotson,	Stump the World,
George the IV.,	Shanghai Cling,
Early Newington,	Pope's Cling,
Hopkinsville,	White Point Cling,
Morris' Late,	<i>Chapline</i> ,*
Grand Admirable,	<i>Jerries' Seedling</i> ,† Ky.,
Catharine Cling,	Allen Cling,
Columbia,	White Heads,
Van Zandt's Superb,	Red Heath,
Ward's Late Free,	Nix, Late.
Bindford,	

LIST BY THE KENTUCKY STATE POMOLOGICAL
SOCIETY—1869.

President, Lawrence Young, Louisville.

Early Tillotson,	Ward's Late Free,
Catharine,	Grand Admirable,
Breevort Morris,	Grosse Mignonne,

* This elegant new peach is a mixture of Indian and White Cling—size variable but generally large. Flesh and skin beautifully streaked with red, with sweet, rich, luscious flavor. Origin, Hart county, Ky. Mature in August.

† This new variety resembles the Hopkinsville. Very large, flavor superb; free-stone. Origin, Hart county, Ky. August.

NOTE.—With other sensible remarks Mr. Woodson warns those who are about to engage in fruit culture, not to depend too much on new, untried sorts, whose qualities and value are not well established; but recommend those who intend planting an orchard to rely mainly on old and well tried varieties. He says also, if you want fruit, buy only acclimated *fruit stock*.

NOTE.—We are indebted to Mr. Woodson for a copy of the list.

White Heath,	Red Rareripe,
George IV.	Tippacanoë,
Early Newington,	Sidock's Late Free, Ky.
Heath Free,	Crawford's Late,
Lagrange,	Hopkinsville,
Van Zandts, superb,	Cole's Early,
Hale's Early,	Old Mixon Free.
Columbia,	

PIEDMONT SELECT LIST—GA.

(Between Tide-water and the Blue Ridge Mountains.)

FREE-STONES.

Hale's Early, Troth's Early, Honey Peach, Early York ; July.

Early Newington, Crawford's Early, Grosse Mignonne, George the IV, Newington Early, free, Columbia, Large Early York, Red Rareripe, Morris' White Rareripe, Malta, Noblesse, Royal Hensington ; August.

Bergen's Yellow, Crawford's Late, Druid Hill, Heath Free, Old Mixon Free, Teton de Venus, Ward's Late Free, Late Admirable, Lagrange, Snow Peach ; September.

Baldwin October, Lady Parham ; October.

PARTIALLY ADHERING.

Early Tillotson, Early Newington, Washington, Atlantic ; July and August.

CLING-STONE.

Chinese Cling, Red Magdalene ; August.

Lemon Cling, Tippecanoë, Blood Peach, Indian Blood, White Heath, Nix Late ; September and October Clings.

AMATEURS SPECIAL LIST.

Nutmeg, white,	Early Tillotson,
Early Anne,	Grosse Mignonne,
Columbia,	Freestone Heath,
Hale's Early,	Baltimore Beauty,
Noblesse,	Double Blossom Peach,

George the IV.,	Flat Peach of China,
Snow Peach,	Weeping Peach,
Druid Hill,	Royal Hensington,
Late Red Rareripe,	Monstrous Pavie,
Honey Peach,	Chinese Cling,
Troth's Early,	Stump the World,
Lady Parham,	Lemon Cling,
Morris' Red Rareripe,	Nix, Late White.
Yellow Rareripe,	

LIST OF CHOICE PEACHES—1869—By F. R. ELLIOTT.

The **SERRATE EARLY YORK** has received universal favor as one of value, in giving fruit of medium size, and of superior quality, free from defects. Next to this,

Troth's Early, Yellow Rareripe, Crawford's Early,

Old Mixon Free-stone, Smock Free,

Early Newington, free, Sturtevant, Crawford's Late,

Columbia, Coolridge's Favorite, Heath,

Late Admirable, Moore's Red Rareripe, Noblesse,

Red Cheek Melocoton, have each had their champions, because of their real and intrinsic value.

ADDITIONAL LIST AND DESCRIPTION OF SELECT PEACHES.

LATITUDE, AUGUSTA, GEORGIA.

Free-stones.

CANARY.—Medium size, pale yellow, flesh yellow, juicy, apricot flavor; very good; delicate fruit, too tender for market; ripe end of June.

FLEITUS ST. JOHN, OR YELLOW ST. JOHN.—Large, roundish, light yellow, with a bright red cheek, flesh juicy, sweet, and of high flavor; ripens with the Early Tillotson and lasts longer. Lately brought to notice in Louisiana, and promises to be very valuable.

FRUITLAND SEEDLING.—Very large, oblate, greenish white, with a mottled cheek, flesh greenish white, very juicy, vinous and of good flavor.

GAYLORD.—Very good, large, white, with red cheek, flesh white, very juicy, rich, beautiful; middle of August. Originated by Dr. Philips, of Mississippi.

GREAT EASTERN.—Very large, (often measuring 14 inches) greenish white, with a slight wash of red, flesh juicy and sweet, sometimes a little coarse; a showy fruit. Originated in the orchard of J. P. Berkman's Nurseryman, Augusta, Georgia; July 20th.

JULIA.—Medium white, with a slight red wash, flesh white, juicy, vinous and good; ripens end of Oct. to 15th Nov. As with all late peaches its quality is modified according to a warm or cold October. Origin, Aiken, South Carolina.

NAPOLEON.—Medium, downy, skin dark red, flesh pink-veined red, juicy, rich; July 20th.

OWENS' SEEDLING.—Medium, white, with a few red veins, flesh pure white, melting and well flavored; 1st to 15th of August.

PRESIDENT CHURCH.—Large, yellowish white, with some mottling of red on sunny side; flesh white, a little red near the stone, very juicy, melting, very good; middle of September. Origin, Athens, Georgia.

PUCELLE DE MALINES.—Medium, skin white, beautifully washed and mottled with carmine, flesh white, sweet and of exquisite aroma; very superior, but too tender for market.

Cling-stones.

BLETCHER'S.—Large, white, with red wash, juicy, vinous and very good; July 20th.

DUFF YELLOW.—Large, white, with red-wash, showy, juicy, vinous, sub-acid, and very good; matures 20th to last of July.

GEORGIA CLING.—Medium, skin white, much covered with red, juicy and very sweet; end of July.

GRISWOLD.—Large, white, much covered with red, juicy and very sweet.

GOODE'S OCTOBER.—Large, skin white, washed and veined with pale red, flesh white, with red veins, juicy, vinous, and finely flavored—of the Indian type; beginning of October.

MITCHELL'S MAMMOTH.—Similar to late White Heath; but a little later.

O'GWYNN.—Large, with crimson cheek, juicy, melting, of good flavor; matures early in August.

SCOTT'S OCTOBER.—Medium, pale yellow, flesh yellow, juicy and vinous—very good; matures early in October.

WHITE PINE APPLE.—White, with a protuberance—skin white with dark crimson near the base, flesh white, red at the stone, melting, juicy, good; ripe beginning of August.

LIST BY THE EDITOR OF THE SOUTHERN HORTICULTURIST.

(YAZOO CITY, MISSISSIPPI.)

Dr. H. A. Swasey, Editor and Proprietor of that excellent periodical, *The Southern Horticulturist*, Yazoo City, Mississippi, has furnished us with the following select list of fine peaches, which, from his personal experience and observation, he confidently recommends for general cultivation in the Southern States. This list of choice varieties for a succession is sufficiently large for most farmers, although it contains but a small portion of the fine sorts that may be profitably cultivated in most southern regions. We are under many obligations to Dr. Swasey:

Early Tillotson,	Crawford's Early,
Yellow St. John,	Bergen's Yellow,
Troth's Early,	Chinese Cling,
Yellow Rareripe,	Crawford's Late,
Cole's Early,	Old Mixon Cling,
Early Chelmsford,	Old Mixon Free,
Coolidge's Favorite,	Susquehanna.
Late Admirable,	Pride of Autumn,
Catawba,	Raymond Cling,
Smock's Free,	Lady Parham,
Ward's Late,	Baldwin,
Heath Cling,	Cox's October.
Lagrange,	

MARKET LIST FOR THE VICINITY OF ATHENS, GA.

Free-stone.

Hale's Early, Early Tillotson, Troth's Early; June.

Red Rareripe, Amelia; July 1st to 10th.

Waller's Early, Washington Free (white), George IV, Early Admirable, Yellow Rareripe, Crawford's Early, (yellow); July 10th to 20th.

Morris' White, White Imperial; 20th to 30th July.

Green Catharine, Old Mixon Free, Late Admirable, Heath Free; about 1st of August.

Late Rareripe, Crawford's Late, Stump the World; August 1st to 15th.

President, Pace, Ward's Late Free; last of August.

Lagrange, President Church; September 1st to 20th.

Baugh, Edward's Late; September 5th to 20th.

Baldwin, Lady Parham; about 12th October.

Clings.

Georgia Cling, Chinese Cling; July 15th.

Congress, Large White Cling, Old Mixon, Baltimore Rose, Lemon Cling; July 15th to 1st August.

Tippecanoe Cling, Washington Cling; August 1st.

Downahoo, Demming's September, Catawba, Eaton's Golden Cling; September.

Dabney's, Hull's Athenian, Austin's Late Red, Gaither's Late, Nix's Late White; October.

We are indebted to the *Southern Cultivator*, Athens, Ga., for the above. It was procured from an experienced and reliable orchardist of that vicinity. It is intended as a list for both home and Northern markets.

SELECT APRICOTS.

Dubois' Early Golden,

Purple or Black,

Moorpark or Peach.

Large Early,

Royal,

Red Roman.

SELECT NECTARINES.

Golden Cling,	Boston,
Downton (free-stone),	Elruge,
Hardwicke,	Hunt's Tawny.

SELECT FIGS.

Celestial,	Golden,
Lemon,	Brunswick,
Brown Turkey,	White Marseilles.

No kind of insects depredate on this delicious fruit.

SELECT CHERRIES.

May Duke,	Early Richmond,
Belle de Choisy,	Black Tartarian,
Belle d' Orleans,	Conestoga.

PEACH BASKETS AND CRATES.

Peach Baskets specially adapted to shipping peaches, tomatoes, and other delicate fruit long distances, may be obtained with or without crates, of the *American Basket Company*, New Britain, Connecticut, or of the *Beecher Basket Company*, Westville, Connecticut, who are equally reliable, or of any other companies, most of whom have agencies all through the South for the sale of their crates and baskets. There may be also Southern establishments for their manufacture and sale.

These baskets are cheap enough to give away, and are so constructed as to carry the fruit with the least possible injury. They are smooth on the bottom and sides, and have no sharp, cutting edges like ordinary splint baskets, or like the common slat crates (we are speaking more particularly of American companies' baskets), and they cost less than either. They are made of strong white wood, put together with annealed and clinched nails, and corner irons; and are so arranged that the fruit cannot be misplaced or stolen. The packages are sufficiently ventilated to secure the fruit from fermentation, and are not so open as to expose it to sand or dust. They are

made of the strongest material, ironed and riveted in a thorough, workman-like manner; and the American Basket Company has a new style of hasp or lock. This hasp or lock combines all that is usually required of a padlock, hasp and staple. It is much cheaper, and at the same time neat, convenient and attractive. As a lock for fruit trees or crates it cannot be surpassed. It can be locked or bolted without using key. (Price \$1.50 per dozen.)

In using these baskets they should be well filled with the fruit and handsomely rounded. The buyer will always honor a full basket; scant measure is an abomination. The racks that separate the baskets admit of heaping liberally. If heaped when packed, the baskets will be full when they reach market, and will find a ready customer.

A NEW WAY TO DRY PEACHES.

Dr. Joseph Treat, of Vineland, N. J., gives the following in the *Practical Farmer*, which he says are new directions for preparing peaches for drying:

“Never pare peaches to dry. Let them get mellow enough to be in good eating condition, put them in boiling water for a moment or two and the skins will come off like a charm. Let them be in the water long enough but no longer. The gain is at least six fold. Saving of time in removing the skin, great saving of the peach, part of the peach saved, the best part, less time to stone the peaches, less time to dry them, and better when dried. A whole bushel can be done in a boiler at once, and then the water is turned off. This very morning we had two bushels skinned, stoned (halved), and on the boards long before a quarter of them could even have been peeled.”

APPLE CULTURE.

ERRATA.

- Page 13, second paragraph, 10th line, for variety read *varieties*.
27, 9th line, for spots read *pots*.
28, second paragraph, 1st line, for making read *make*.
31, third paragraph, 3rd line, for warmth of read warmth for
34, Angsburg read *Augsburg*.
44, 13th line, for cottonwick read *candlewick*.
61, 6th line, for growing read *grown*.
79 and 82 inadvertent repetition of quotations.
111, in note, for vines, read *rinds*.
120, for Reinett read *Reinette*.
120, for Domine read *Dominie*.
125, for stave read *starve*.
129, second paragraph, for nibbed read *nipped*.
141, for King of Tompkin's City read *King of Tompkin's County*.
147, for Grims' read *Grimes'*.
150, Baldwin should be listed as a fall apple in the South.
151, May Apple, *White Juneating*, Early May of the South.
157, for Mason's Pippin read *Mason's Stranger*.
157, in note, for Norfolk read *New York*.
193, last paragraph, for Dr. Teith read *Dr. Fitch*.

PEACH CULTURE.

ERRATA.

- Page 244, eighth line from bottom, for wood aches read *wood ashes*.
275, for Montagne read *Montague*.
279 and elsewhere, for Royal Hensington read *Royal Kensington*.
282, for Large Yellow York read *Large Early York*.
284 and 285, for Malacatunc and Malagatunc read *Melocoton*.
285, for Molocoton read *Melocoton*.
286, for Malacoton read *Melocoton*.
288, Class III omitted at No. 49.
296, No. 83, for Van Buren and Golden read *Van Buren's Golden*.
301 and elsewhere, for Coolridge read *Coolidge*.
314 and elsewhere, for Brevoort read *Brevoort's*.
316, for Fleitus St. John read *Fleitas St. John*.

NOTE.—The nomenclature of Southern fruit has been in great confusion. Typographical errors remedied in second edition.

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NOTE.—The *Pound*, *Wall* and *Summerour*, are Synonymous names for Nickajack.

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Belle Couquete (new).	Hopkinsville, Free—Kentucky.
Belle Doue (new).	Hull's Athenian—Georgia.
Binford.	Jacques Yellow Rareripe—Georgia.
Bloodgood's Large Green.	Jerrie's Seedling—Kentucky.
Bradford's Free—Georgia.	Late Rareripe.
Breckenridge—Kentucky.	Late Heath Free—Southern.
Brevoort's Morris, Brevort—N. Y.	Malta, <i>Belle de Paris</i> .
Catawba—Southern.	Parker's Late—Southern.
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Clark's Early—Missouri.	Pride of Autumn—Mississippi.
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Cole's Early—American.	Raymond Cling.
Coolidge's Favorite—American.	Rodman's Cling—Georgia.
Congress.	Rose Hill, Seedling—Georgia.
Dabney's—Mississippi.	Scott's Nonpareil—New Jersey.
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Early Albert, (new).	St. Louis—Missouri.
Early Admirable.	Shanghai Cling.
Early Chelmsford.	Vineouse.
Early Silver, (new).	Walburton Admirable—England.
Early Victoria, (new)	Walter's Early—New Jersey.
Early Yellow Rareripe—Southern.	White Imperial—New York.
Edward's Late—Georgia.	White Heads.
Fay's Early Ann.	White Point.
Gaither's Late—Georgia.	



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