TEN YEARS'

PRACTICAL EXPERIENCE

IN

Grape and Small Fruit Culture,

BY

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INTRODUCTORY.

THERE are a good many books and periodicals published on the subject of Grape and Small Fruit Growing. But since it is apparent that those books are generally too scientific, or too circumstantial as to be easily understood by illiterate men, or are mere literate productions without that solid foundation of practice which can only be laid by experienced growers, they are of but little use at a moments notice; and since those periodicals according to their nature needs must treat the subject in a scattering way, the grape and small fruit grower who had little or no opportunity to go through a course of scientific training, is nine times out of ten at a loss as far as reliable advice is concerned. This being apparent, I conceived the idea of supplying a *practical* guide which would condense the broadcast materials down to a few simple principles and recipts couched in simple language, and void of all learned generalities, thus placing the subject upon the sound basis of practical experience, planked together with the platform of popular science. For experience, I claim the authority of ten years observation and practice on J. P. Preyer's 131 acre Lakeview Wine Farm, East Cleveland, Ohio, widely known in this and adjoining States.

In conclusion, I would simply say that this little practical essay is principally designed for farmers and small land owners' *family use.*

HUGO C. PREYER.

Part I.

GRAPE CULTURE.

PREFACE.

THERE are a good many farmers and small land owners who are of the opinion that a soil especially fit for grape growing is required from the commencement. This is erroneous. Every dryish soil that will grow good corn, or potatoes, is good enough. Vines are to be cultivated with success throughout the entire Indian corn-growing region, on the heaviest soils and in the lightest gravel, on the rocky hill-sides of New England and in the alluvial bottom lands of the West, from Maine to California

In every one of the five principal grape-growing regions of the Union, namely, the Ohio Valley (Cincinnati), Lake Shore (Lake Erie), Pleasant Valley (New York), Hermann (Missouri), and California regions, six years vine culture has not very seldom enhanced the value and price of ordinary farm land from $50 to $500 per acre, but it has never lessened its worthiness and market price.

Vineyards are foremost in the class of improved lands, and their superiority, as far as rentability is concerned, cannot be doubted.

In this respect, I would say, like the author of "My Vineyard at Lakeview," (New York, 1866, Orange Judd & Co.), to every one who is the owner of a farm, or even of a garden of the smallest dimensions: "Try a few vines; the task may lead to more successful results than you have any conception of." And why? There is no plant in existence like the grapevine to adapt itself so well to all sorts of localities, even to such as where fruit-trees, flowers, corn, potatoes, etc., find no foothold. The principles of its cultivation are plain and very easily practiced, and there is indeed no difficulty hidden under the surface of any vine-growing soil. A little care, a little labor,—much pleasure, and little disappointment. That's all.

Vines with, and grapes in, full foliage are ornaments to gardens and improvements to fields; they yield rich harvests besides. A fine grape upon the table is no less an ornament than a tasteful delicacy. The wine manufacturing process does not involve any sorcery at all, and the access to market is nowadays easy, both for grape and wine.

Therefore I cannot help repeating those golden words, "try a few vines."

I. Groups and Varieties of the Grapevine.

I do not propose to write a treatise on foreign vines proper, nor do I expect to give a description of every American native at present under culture in our vineyards, but it is my design to confine myself to about twenty principal varieties which present themselves in five groups to the eye of a man not much versed in botany, viz: The Isabella, Catawba, Delaware and Southern Groups, and finally the European Crosslings.

A. The Isabella Group.

1. The *Isabella*, the oldest and one of the most popular of the natives, was introduced in 1825, by a South Carolinian, and still in 1851 this grape and the Catawba outshone all other varieties in the Northern States. Large conic bunches; large oval berries which blacken early to a dark purple color, but ripen slowly; thick foxy skin; neither tough nor sweet at the center; feeble flavor and spirit; lack of saccharine. The berries drop badly in the cold. Being three-quarters ripe, they are better gathered, for when, at that time, the toughness at the center ceases, its acid mingles with their sweetness, and decay sets in, killing their vinous life. Thin papery leaves. This vine can stand ordinary winters, but not so well the sudden changes summer. Ripe from October 1st. Good marketable table-grape; no wine-grape; the most excellent grape for preserves because of its freshness and undeveloped saccharine in its skin; most recommendable for family use.

Remark—Train the Isabella on trellises, if you want to prevent its bad dropping, and reach the utmost development of the saccharine in its skin.

2. The *Concord* is a vigorous and healthy grower, very seldom subject to diseases, and therefore most generally planted. Large purpleish black berries with white bloom which are surpassed in hardiness only by the Delaware; the center remains unripe and acid; the skin is thick and foxy, and the buttery flesh contains little sugar and spirit. The grapes become the better the older the vine grows. The leaves are enduring and rusty on their under side. Ripe from September 15. As a table grape, the Concord is a favorite. General James G. Negley calls it "the best market variety where it succeeds well," as with I. Knox in Pittsburgh, Penna. Concord wine will probably supplant Bordeaux, the straw-ripe, raisin-like grapes being best fitted for manufacturing (light) wine. Some years ago the missionaries considered it the most profitable wine-grape. Concord grapes are finally very good for preserves.

3. The *Israella*, under culture since 1850, called the American Hamburg, is one of the earliest. Large shouldered branches, with oblong black berries, which are hardy, sweet and rich, and, adhering firmly to their peduncles, can stand frost. The grape contains no toughness at the center, is thoroughly sweet and fleshy, and not subject to rot. Its strong foliage is exempt from mildew. Ripe from August 20. Excellent table grape, next to the Eumelan the best black one, and fit for making raisins.

4. The *Rebecca*, introduced by E. M. Peake, of Hudson, N. Y., prior to 1857, is not so vigorous as the Isabella, but neither disposed to mildew, and looks like a foreign grape. Cylindric bunches of four inches in length and two inches in diameter; round, translucent berries of medium size, with sweet, juicy flesh and a pure perfume; their color is light green in the shade, and golden or auburn in the sun, covered with a light bloom; they adhere well to the bunches and keep sound, but don't contain much of vinous spirit. The leaves fall before the maturity of the wood and fruit. Ripe from September 20. Pleasant table grape.

5. The *Union Village*, introduced by the Shakers of Union Village, near Cincinnati, Ohio, is the very giant among the grapes, and the most showy exhibition berry, twice as large as the Isabella, and of the same quality. Vine foliage, and berries of a very large size; single bunches often weigh over two pounds. The berries are black, and their bloom is of a lighter color. It is immensely productive, but over-bearing will kill it in winter next, and young vines

suffer from the severity of northern winters. Stopping shoots prior to September is necessary. There are a great many spurious varieties, and the true one is very scarce. Ripe from October 1. Being tender to the center and of so huge, I might say, California size, it is a good ornamental table grape.

6. The *Adirondac*, formerly found wild on the shores of Lake Champlain, near Port Henry, and introduced by I. W. Bailey, of Plattsburgh, N. Y., is one of the earliest, but requires warmth and shelter. Its large, black grape hangs long in large bunches on peduncles, is lon and round, has a thin skin and delicate flavor; contains a melting juice and no acidity or toughness at the center, but not much of sugar either, and is as hardy as the Isabella. Its Isabella-like foliage is not enduring, but withstands mildew, rot and sun-scald well. It commences to ripen with a reddish transparency, equals the Black Hamburg, and is said to come nearest to a foreign grape. Recommendable for the Northern States and both Canadas. Ripe from August 15. Good table grape; as a wine grape some say it equals the Catawba, and is 25 per cent. better than the Diana.

7. The *Martha* or *White Concord*, introduced as a seedling of the Concord by Samuel Miller, of Lebanon, Pa., is called by the horticulturalist G. Husmann, of Hermann, Missouri, the most promising of all new varieties, and indeed one of the three best white grapes. Pale yellow berries with a golden tint, and but a little smaller than its parent, whose foliage is less enduring, however. The plant is hardy, healthy and vigorous, and its compact and heavy shouldered bunches are of medium size. Ripe from September 10, or some days earlier than the Concord. Very good wine and table grape.

8. The *Creveling*, the best flavored of the hardy early varieties, is one of the earliest of the group and superior to the Isabella. Its large, but straggling and ugly looking bunches, bear large, round, black berries, with a purple bloom, the flesh of which is tender and very sweet. Moderately productive. Ripe from September 10. Very good table grape.

9. The *Cuyahoga*, introduced by Mrs. Wemple, of Collamer, near Cleveland, O., bears large, translucent greenish-white berries, which are very vinous, tender, juicy, and without any toughness at the center. Medium-sized, compact bunches. Its leaves are not hardy. Ripe from October 1, and are a good table grape.

B. The Catawba Group.

1. The *Catawba* is of Southern origin, and was introduced by Major Adlum, of Washington, D. C., in 1845. Being a principal variety, it is mostly planted in the Lake Erie region, together with the Isabella; in the Ohio Valley, or Cincinnati region, it has remarkably failed from disease, and at Hermann, Mo., it has been superseded by other vines. In most northern climates it is subject to rot, but not in the Lake Erie region; frost sometimes is injurious. Large, compact, branched or double-shouldered bunches. Its round berries are at first coppery red and veined with violet, but become, when ripe, of a dark purple color and translucent; they are tough at the center, and contain much tannic acid in their juice, whence their eminent fitness for wine manufacture. Its peduncles are strong, and the berries adhere well to them. Ripe from October 1. Principal wine grape; berries a little dried up, and cut when the peduncles commence to turn quite brown, are best for this purpose; twelve pounds of Catawba grapes furnish one gallon of good wine; the best marketable table grape for export; not fit for making raisins.

2. The *Diana*, introduced by Mrs. Diana Crehore, of Milton Hill, near Boston, Mass., in 1845, reaches, after eight years' growth, its full degree of perfectness, and is the improved Catawba, being two weeks earlier, richer, purer and more spirited. Its Catawba colored and sized berries are spicy, aromatic, of honey sweetness, hardy and only surpassed by the Delaware and Iona, their little wine manufacturing qualities notwithstanding. When young, the Dianas are disposed to over production which can be prevented by not crowding them, and stopping their shoots toward the last of August; they can stand severe frost, without being damaged; late keeper; ripe from September 10. Not much of a wine grape; it gives, mixed with the Delaware, a good wine though; excellent table grape; well boxed, it remains fresh until April. Excellent for raisins, because of its aromatic freshness.

The introduction of the Diana was the first step in the direction of improved grape culture.

3. The *Anna*, one of the best three white grapes, is not surpassed in purity, richness, vinity and vigor, by any hardy grape It was introduced by Eli Hasbrouch, of Newburgh, Orange County,

N. Y. Its leaves are freshy and not subject to mildew; early in the season they bear yellow marks; large, round berries, well adhered to their peduncles, but a trifle subject to rot, with a very little toughness and no acidity at the center; of a light amber in the sun, and pearly white or green in the shade, and of the highest flavor, sweetness and spirit. The grapes bear a white bloom with a few intermingled brown dots on their pretty, thin epidermis (skin), and ought to remain hanging long on the vines, since they are never injured by frost. Ripe from October 1; excellent table grape; most recommendable for raisins; may be mixed with other grapes for wine making purposes. A real benefit to sick persons, it being the most salubrious among the grapes known as yet.

4. The *Iona*, an offspring of the Diana, was introduced in 1857 by Dr. C. W. Grant, of Iona Island, Westchester County, N. Y., and received the Greeley prize of $100, in 1864. It ripens farther North than the Concord; it grows, like the Delaware, in any latitude, but is, for instance, at Augusta, Ga., only two months for use, while it lasts six and seven months in the northern and central regions, and finally almost sides with the Delaware as a table and raisin grape, at the same time being the fleshiest of all American grapes. Double-shouldered, or winged large bunches; hard wood; the rich, fleshy and enduring foliage remains until the fruit is fully ripened. A late keeper, and very productive; no rot; large, crimson berries with violet veins, transparent from their first setting; melting flesh, tender to the very center and not losing its vinous spirit and muscatel aroma, even in winter. Ripe from September 20; not very much of a wine grape, but next to the Delaware, Herbemont, and a few others, the most excellent table grape; affords also the enjoyment of most spirited and delicious raisins.

5. The *Eumelan*, a new variety, will probably supersede the Isabella, which was ere this the best black table grape, and is recommendable to the horticulturist. Only one strong cane should be allowed to grow. Large and compact bunches; large black berries with fine bloom, pure flavor and tender, melting flesh, the juice of which is wine-like when thoroughly ripe; the berries adhere firmly to their peduncles, because the plant is perfectly hardy. Ripe from September 20; excellent spirited table grape to which transportation does no injury; it gives also a fine red wine.

C. The Delaware Groups.

1. The *Delaware*, the leading variety among the American natives, and called "the little amber gem of the vineyard," was first exhibited, in 1845, by A. Thomson, of Delaware, Ohio, under the name of the Heath Grape, but the development of its culture was rather slow, almost as slow as its growth itself; growing in any latitude or soils, but especially on highlands; it is at present planted and reared in every one of the five principal regions. Hard wood, vigorous stalk and enduring foliage, early, compact bunches; small and imperfect berries of a beautiful wine color, which are rich, sugary, juicy, sweet to the center, of a delicate skin, transparent when ripe, firmly adhering to their peduncles and deliciously flavored, their flavor resembling that of the French Frontignans. Being a late keeper, and containing more saccharine than, for instance, the Chasselas de Fontainebleau (France), and twice as much as most natives, it is superior to all of these, and not inferior to any foreign grape, I presume. Being disposed to overbearing, and of a sensitive nature, it needs a great deal of care and labor. Ripe from September 10; in Georgia, however, from July 5 to 10; a most excellent table grape; fine transparent raisins; a very good wine grape; 10½ lbs. of berries furnish one gallon of wine, which will develop its excellent qualities in full only after three years.

D. The Southern Group.

1. The *Lincoln*, also called the North Carolina, the original borders of which were the mountains of western North Carolina, is one of the most valuable of the Southern Group. Its small, black berries are rich, spicy, vinous, although a little foxy, and contain more saccharine than even the Herbemont; their aroma is muscatel. Ripe from September 10; a fine table grape. Lincoln wine is said to be only a little inferior to Delaware; keeps well and improves by age.

2. The *Pauline*, or *Georgia Burgundy*, hails from Georgia, and is pronounced by A. D. Cardence, of South Carolina, as being decidedly of American origin. Its reddish brown berries, are very sweet and juicy, of the Herbemont size, and transparent, never rot; loose bunches; is said to be nearly as good as the Delaware; ripe from September 10; delicious table grape; good wine berry.

3. The *Elsinbury*, a hardy and healthy variety from the South, was first taken under culture in 1844, at Salem County, New Jersey.

Large long bunches, diminutive berries, of a blueish purple, with a very thin, closely adhering skin, and red juice. They are spicier than the Lincoln, and tender to the center, but their merits have been greatly overlooked. Ripe from September 20; a delicious table grape, and as such not surpassed by any.

4. *Ives' Seedling*, a very promising wine grape; is, although extensively cultivated at the West, not yet generally known at the East, but it is already beyond doubt that it has a future with the wine manufacturers of the land. Dark purple, perfect and uniform berries, a little larger than the Delaware, in medium, compact bunches, and more juicy than fleshy, with a peculiar foxy flavor, which gradually disappears from the wine in advancing to older age. Free from mildew. Its health, vigor and general good qualities notwithstanding, it was long overlooked. Ripe from September 20; no table nor raisin grape; as a leading wine grape it is very valuable and marketable at a high price, and brings from 7 to 9 cents per pound, whilst the Catawba is generally sold at 5 cents; its wine is like Burgundy.

5. *Norton's Virginia*, the best red wine grape in the market, is now widely cultivated and appreciated by connoisseurs, although it is comparatively young. Bunches of medium size and pretty compact. Black berries of a hardy and vigorous nature, which contain considerable tannic acid, soft, sweetness and vigorous flavor, without foxiness; thin skin; the pulp is very juicy, not fleshy, ripens to the center, and contains more saccharine than almost any one of our natives. The adherent qualities of the berries are indicative of late keeping in the highest degree. Ripe from October 15, near Cleveland, O. No table nor raisin grape; excellent wine grape. Norton's Virginia resembles Bordeaux, is an authoritively recommended remedy in cases of diarrhoea, and brings about $3.00 per gallon, at which price it is marketable, even under unfavorable circumstances, occasioned through very little demand.

E. The European Crosslings.

1. The *Herbemont*, the best Madeira wine grape of America, and as such plentifully cultivated in Missouri, probably belongs to the Pineau family of Europe, and is quite dissimilar to the foxy natives. Either Sir Walter Raleigh (Oct. 30, 1618), introduced and planted it on the banks of the Roanoke about the end of the XVI century, or the first French settlers brought it along with

them to Louisiana in 1682. Afterwards it became wild growing. N. Herbemont, an emigrated Frenchman, from Burgundy, found it as such in the woods of Georgia, and transplanted it on the soil of South Carolina in 1834. It is the most vigorous vine in growth, and the richest in crop, giving, for instance, 500 gallons of wine from one acre in Missouri, some time ago, and can stand the North ern climate as far as one degree north of New York. Dark-blue round berries, sometimes crimson, of one-half inch in diameter, without flesh or fibre, slightly acid, spicy and juicy, but without perfume, very tender and adherent skin, without the least foxiness ; large and handsome, double shouldered bunches, large violet canes, covered with waxen bloom ; the young shoots are necessarily to be stopped before the last of August, like with the Diana. Ripe from September 15. Excellent table grape ; very good wine berry, but not much at the North. No raisin grape.

2. *Allen's Hybrid*, introduced by I. Fisk Allen, of Salem, Mass., as the first specie crossing the native Isabella with a foreign variety, the Chasselas de Fontainebleau of France, and sometimes considered as the best white grape ; is a vigorous grower and earlier bearer. Its hardy leaves are free of mildew ; its good-sized bunches and berries white in the shade, and green amber when ripe and sound, with a rich vinous flavor and muscatel aroma. Ripe from September 20. Excellent first-class table grape,

3. The *Wilder* or *Roger's Hybrid, No.* 4, an early variety of established reputation ; is very productive ; large and compact bunches. The berries are larger than the Concord's, prior to which they ripen ; deep blue-black, tender, sweet and piquant ; they have a thick skin and keep well. Ripe from September 10. Fine table grape.

F. General Remarks.

1. As the best *table grapes* containing the requisite quantity of tartaric acid and saccharine are considered :

A. The Delaware, Eumelan, Iona, Elsingburg, Diana, Lincoln, Herbemont, Pauline, Adirondac, Martha, Wilder, Anna, Allen's Hybrid and the Israella.

B. The Catawba, Concord and Clinton.

C. The Isabella, Hartford, Prolific, Rebecca, Union Village, Crevling and Cuyahoga.

The most remarkable for long transportation, however, are the *Catawba* and *Concord* varieties.

2. As either excellent or good marketable *wine grapes*, I would mention:

A. Norton's Virginia, Ives' Seedling, the Delaware, Catawba, Concord, Martha and Clinton.

B. The Iona, Diana, Adirondac, Anna, Herbemont, Lincoln and Pauline.

As long as the standard of American wine manufacture will remain a low one. Catawba wine will be the most asked for, although Norton's, Ives', Delaware, and some other Southern, or compound brands, are far superior.

4. For *raisins* fleshy grapes are required, such as the Delaware, Iona, Israella, Diana, Anna, etc.

4. For *preserves* use the Isabella (the best) and Concord.

5 For trial in new localities I would recommend no other but full established varieties, such as the Catawba, Isabella, Delaware, Concord, Iona, Clinton, Martha, Diana, Crevling, Hartford, Prolific, Norton's and Ives'.

II. Historical Review of Grape Culture.

Grape culture is of an ancient date. The old Indians, Egyptians, Hebrews, Greeks and Romans cultivated the beautiful vine in times of yore. Three thousand years ago, Hesiod, a renowned poet of Hellas, wrote on the subject, and the elder Pliny, the great Roman naturalist, who was born when our Savior was twenty-three years of age, knew already of ninety varieties, and fully described almost the same methods of training and pruning which are now in vogue. In those remote days the vintagers of Campania, a fertile province of Southern Italy, had the climbing vine embrace the lofty poplar, and in other regions it was trained to the elm tree, instead of a stake.

Those ancient oriental ancestors of our grape-growers called the vine a tree, of such immense size and age was the stem. Only think of that famous vine six hundred years old that Pliny talked of. In America, me seems, it does not reach the same size and age, at least, not generally, for if people relate of some huge vines in the alluvial

soil of the Ohio Valley that attained three feet in circumference each or a Californian vine is boasted of having a circuit of even ten feet, with 7,000 bunches of grapes upon it at a time, these prodigious specimens are merely exceptions. The highest age of the American natives is estimated at fifty years.

Only the grapes of Syria, and Persia, and those on the hill-sides of the Caucasus and Himalaya in Asia attain perfection and full ripeness; the natives of America and Europe never.

In Europe, where at the present time the Germans, Spaniards, French, Hungarians, Italians and Greeks are foremost in grape culture, the vine growing region extends from the 36th to the 52d degree of Northern latitude, whilst our vine zone is girdled by the 23d and 41st degrees. Europe is comparatively warmer than North America, because of that great heating apparatus, the gigantic gulf stream.

Grape culture commenced on this side of the briny Atlantic two and three hundred years ago, when the first English and French settlers came to this country, then, so to speak with Robert Burns, full of wild hanging woods and loud pouring floods, but it broke down pretty soon, and therefore we have to date it properly from the introduction of the native Catawba, its healthy and vigorous pioneer, in 1825.

Grape culture is one of the standard bearers of civilization on the road to prosperity. "Let every man dwell safely under his own vine."

III. Location.

Any dry soil that will grow corn or potatoes is well fit for vine growing. Stony soil, far from being an obstacle, is so much the more promoting the growth of vines and their health and vigor. It has been shown to evidence that stones are excellent keepers of warmth, and warmth is a life-preserver proper to the whole vinous kindred. Heavy clay may be considered preferable to light sand, but the latter can also be adapted.

Dry sub-soil, either natural or worked through artificial drainage, is required in the first place, because the lodgment of water in the soil needs must be as injurious to the vine as *excessive* dryness

The lowest degree of moistness is no wetness or dampness; yet, however, any location which is exposed to the sun for the greatest part of the day, is recommendable, and especially so, if it is situated on or in the vicinity of lake shores, river banks, or even pond and creek slopes, since the influence of the water upon the atmosphere has the power of protracting the growing season, through additionally giving it three or four more weeks so desirable for ripening the berries.

It being absolutely necessary that the cane, together with its foliage be fully turned to the sun, every vinyard or single trellis and stake naturally ought to be located on the south or south-west side of a hill, slope or house, and should be sheltered from northerly and westerly winds—which in consequence of their drying and tearing tendencies, necessarily are most injurious—by walls, board fences or belts of trees, especially evergreens.

The sun is the very pater familias of the vines; the earth needs an improved condition for efficiently being their nourishing mother; but destroying blasts of wind, rapacious weeds, melancholic fogs, the vapors of boggy swamps, the devasting powers of water, and its damp sediments are as many inimical elements.

The viny kindred will never prosper under the whip of the tornadoes of the West Indies, nor in the dismal swamps of both Carolinas. They are, besides, rather so to say, mountaineers and 'longshoremen by birth and occupation.

IV. Soil and its Preparation.

Precursory to planting a vineyard is the preparation of the soil.

A level, non-sloping ground I would not recommend, because, the sloping tendency of a tract of vine land is necessarily required for its drainage. An incline plane of some steepness only needs upper drainage for taking away the surplus water, but a ground which is only a little sloping needs under-drainage, through drains of about twenty-four feet apart, and three feet deep, between rows which, by-the-by, increases the temperature about ten or twelve degrees; the former tract is preferable, of course.

Therefore, a pretty steeply sloping, dryish ground, which is sheltered from northerly and westerly winds, is to be selected for a vineyard. I mention here, right away, that severe freezing, and espe-

cially the sudden changes from freezing to thawing, are very injurious to the young stalk in their course of growing. Moistness is not damaging in spring, but it ought to be reduced to its lowest degree before the end of June, when several diseases appear, to which the Catawba is not much subject, however. Be it said at the same time that the newest varieties are less often attacked by mildew than the old stock.

In most cases the soil is rich enough without any manure, it being a general rule that too rich, or enriched, soil will produce rich wood and foliage, but very poor berries. In case manure is to be used, in order to bring a very poor soil to a good standard of bemothering the vines, a moderate coating of well-rotted stable or barnyard manure, eventually well mixed together with entirely rotted pasture, roadside or meadow sods, is applicable. Green sods should not be used at all, because of their containing a good deal of weeds, and the same is to say of the hog and horse manures, the former being possessed of too little heat, and the latter of too much; mixed with other manures, both of them will work well though.

If the ground is too compact, or sandy, or open soil of a different character, or a good amount of leaves, mould or muck can be so intermixed with it.

The best time for preparing the soil is the month of March, after it has been plowed and harrowed, or worked otherwise, in the previous fall. If manuring is required, scatter the dung stuff over the surface and plow it under. Plow the field from eight inches to one foot deep, or deeper, if possible, and the garden from one foot to two feet, then harrow it, and see to well clearing it of weeds, grasses and other plants which would be as many competitors in eating up the livelihood of the viney kindred; only heavy and compact clay soil may be subsoiled, not for throwing the underground up, but only for stirring and loosening it.

The aspect of the pulverized condition of a well-worked soil designated for bedding the vines in, is full of hopes for their early and vigorous growth, and planting may be undertaken at once.

V. Plants and Planting.

Not intending to speak of or recommend the use of any plants propogated from single eyes or buds, although I know very well that every eye or a bud is an infant plant without roots. I will say that concerning the choice of settings, to a certain extent, the social adage, age before beauty, is indicative ; age, in our case, being preferable to largeness. A plant three years old with plenty of strong roots and thoroughly ripened wood is considered best, if it is, at the same time, healthy at the center where roots join wood.

The canes having been cut down to one or two eyes, which needs must not be damaged, and their roots to a length of 12-15 inches, are ready for being planted.

The first work to be done is the marking of straight-lined rows, running north to south. Then these rows are either furrowed out both ways, as though it were for corn, eight inches deep, and made ready for receiving the plants at six feet distance between each of them, or dug out, the holes being at the same distance and of the depth, (seven inches in clay), and two feet in diameter at the bottom, to bed the plants in ; but this is a rule, the smaller the setting, the less deep the excavation. The method of furrowing is the easier way, that of digging the safer, however.

I repeat, in this place, that every border must be made attractive of moisture, but not of wetness or continued dampness ; watering at sunshine is to be avoided ; if, at the time of planting, the weather is warm and the soil dry, one quart of water to each vine poured around it before sunrise, or after sundown will be sufficient.

The bottom of the hole referred to above, ought to have a ridge two inches high at its center, to lay the cane upon, the roots, of which are to be equally and uniformly spread from there, and to be elsewhere quite level and without the least depression. Then pour pulverized soil from a spade upon the roots ; then fill up the hole and make the soil finely compact by pressing it with your feet or hands, and take care that the soil be most compact at the axes of the stem or cane. To mulch the surface of this filling with course material, such as straw, course barn yard or stable yard and chip manure, or with wood ashes is recommendable, but not always necessary. Po-

tatoes, turnips, or strawberry raising is allowable between rows, especially if the vintager adopt the proportion of six by eight feet instead of six by six.

Regular stake setting, of little use at the time of planting, and in the first year, will be timely in the spring of the second year, but a small stick about two feet above the ground is useful for indicating the spot where the vine was planted, and training the cane to it. Planting in rows of six by eight gives 900 vines to the acre, and six by six feet, 1,200, all told and roundly cyphered.

VI. Training and Pruning.

A. Generalities.

The vine being a savage and a native of warmer climates, it must be subjected to training and education, like man, and at the same time its acclimation in northern regions and less congenial climates generally is necessitated. This is the uniform object of training, and pruning, and working all together. Vine culture in America was experimental in the first place, and only experience could enable vintagers and nurserymen to apply the best method of refining a native savage from the large vegetable kingdom.

My design is, however, to simplify the whole training, pruning and working practice, and to give, in this respect, the most possibly plain advice and directions, since I am well aware that an unexperienced farmer or small land owner who made up his mind to attempt vine growing, and for this purpose, has read through, for instance fifty pages of methodical advice, or grape growing methodism, gotten up in an embarrassing manner by bewildering and self-bewildered theorists, feels as puzzled as the old, genuine Dutchman with the traditional mill-wheel turning in his head.

Here are a few general maxims based upon, and aiming at, sensible practice.

1st. It is a matter of fact that, if the infant vine was not well trained nor sensibly educated (cultivated), the adult vine will necessarily bear the germs of degeneration, or debility, or at least its old, savage habits in its body, although it may appear to be in a flourishing condition.

2d. Productiveness, and not exuberance of foliage, nor abundance of green or wild wood is to be aimed at; consequently this is a rule: restrain the savage tendency of the vine to extend itself, particularly in an upward direction, and do not overcrop or overgrow it. Extreme productiveness naturally is opposed to excellent qualities of fruit, just so as early marriage and cohabitation is the most evident cause of feeble children, and if it should become general, a feeble generation would be the next.

3d. The vine is to be kept low, particularly in cold localities, because it is warmer near the earth, than higher up, and the tips (ends) of the shoots are easily damaged by frosts. Bunches from a high trained vine don't furnish any good wine grapes. With the Rhinelanders, so famous for their unsurpassed skill in vine training and grape growing, you never find a high raised vine, and in cold Minnesota they keep their fruit-bearing canes only a few inches from the ground

4th. All grapes, chemically analyzed, principally contain sugar and water, and these constituents are also found in the air; therefore, as a matter of logical consequence, the vine is not very exhaustive, and for its nourishment the maternal soil is little drawn upon. Wheat and corn, on the other hand, abound in phosphates drawn from the soil exclusively, and naturally are of a very exhaustive character, heavily taxing the maternal earth and requiring rich manure. But there are also some inorganic constituents in a grape, such as tartaric acid, tannic acid, &c., and therefore it is a matter of course that the manuring of vineyards or vine borders with inorganic manures, such as wood ashes, lime, and vine cuttings is required for furnishing these constituents of the grape for which the air cannot be drawn upon.

5th. Table grapes needs must have more richness of soil at their deposition than wine or raisin grapes.

6th. Tying the vines too tight to the trellises or stakes is injurious, because it obstructs the free flow of their sap, *i. e.* the blood of their veins and arteries

7th. Excessive pruning is always a cause of diseases to the vine. In evidence of this fact, I would refer to some vintagers who have tried not to prune at all; all their vines were found free of diseases, but, at the same time, fruitless paupers May it be mentioned here, in conclusion, however, that the Isabella, Clinton and Concord varieties, in their fruit bearing condition, are very fond of long canes.

8th. For field culture, as well as for the purpose of wine grape growing, stake training is by far the more recommendable system. Table and raisin grape growing admits of both the stake and trellis systems, with equal benefits.

Remark—I would say here, right away, that pruning is included in the training process, and will not allow to be separately written upon, since it naturally belongs to, and is the main feature of, the education of the vine in its different phases and epochs.

B. Stake Training and Pruning.

A vine is not fully established until after the fourth year, and therefore I expect to give simple directions as to how to train and prune up to that time.

Pruning is necessary to keep the growth of the vine within certain limits, beyond which to trespass its climbing tendencies attempted at, and to distribute its shoots and fruit equally. Pruning too near to the bud, or eye, is generally damaging, because it involves the latter in the drying down process which immediately sets in after pruning.

Fall pruning is less recommendable than spring pruning, but it may be performed, in order to avoid the accumulation of spring labor; only leave one or two more buds, because frost often kills the tips of the cane, and cut them off in spring, if they have not been spoiled by frost.

Spring pruning is to commence about the middle of February when the action of vitality, *i. e.* the moving of the sap, has not yet arisen from its winter sleep, and fall pruning when it has ceased, about the middle of November.

Stake setting is not absolutely required during the first growing season, but small interim sticks two feet high will answer the purpose of indicating the planted vines and tieing them when sufficiently grown. The stakes may be located, nevertheless, at the time of planting as well, or else in the spring of the second year. Have them made of durable timber, such as oak, chestnut or acacia, and placed on the northern side of the borders, about six inches from each vine, six feet above the ground and two feet under it; if their underground portions be tarred, they are less subject to rot.

In conclusion, I feel bound to mention a couple of characteristical features, such as the tendency of growth is from the center of

the ends of the shoots: growing canes generally become longer than fruiting ones; superfluous flower clusters are to be removed as soon as they appear, because they are very exhaustive, etc. Now I am ready to go into the training and pruning process of the quadrennial period above mentioned, right away, starting from the supposition that vines with two buds left have been planted.

The first, or rooting year, when the shoots are one foot high, cut the old wood and the feeblest shoot down to the lower shoot, and let the latter become a cane tied to the stake. The new leaves and small laterals (branch shoots) are better left alone and not rubbed off. As many shoots and leaves as there appear above the ground, as many roots and rootlets there are under the ground.

The second or caning year, keep the stump possibly short. Allow two canes to grow from the two lower buds to a height of not over six feet, corresponding with the height of the stakes. Rub off the buds, commencing from the tips of the canes, but always leave two additional leaves and laterals which are to be cut down to one foot each. Cut both of these canes down to two buds each, when their action commences to cease in the fall.

The third or settling year, the principal canes become standards. Allow four canes to grow from the two buds left on each of the canes of the second year; two of them may be trained to a slat reaching from the foot of one stake to the top of the neighboring one, or to additional stakes, and two to the main stake. The latter may be allowed to bear fruit, if the vine be very strong and healthy; if not, all flower clusters should be removed as soon as they make their appearance. Shorten the laterals to one foot in length, and the canes, during the growing season, to 6 feet long. In fall cut the two *stake* canes, or standards, entirely off, and cover the two *slat* or branch canes, after having laid them down, with soil, in order to protect them from frost. But this covering is only necessary in very cold localities, and with certain varieties of a very sensitive character. In this latitude, *i. e.* that of Cleveland, it is sufficient to cut the *slat* canes down to from four to six eyes and leave them uncovered.

The fourth or fruiting year, allow four canes to grow, two of which, the slat canes of the previous year, are to become fruiting canes and to be tied to the stake; whilst the other two, the stake canes of the last year, are now only growing canes and to be tied

to the slat or additional stakes. Those fruiting canes will bear from three to five bunches of grapes on their laterals each, which ought to be stopped at the second leaf beyond the last bunch. Remove the flower clusters from the two growing canes and their laterals. In fall cut the main stake canes down to the last bud, and the others to from four to six eyes.

Hence, *i. e.* from the end of the fourth season, the training and pruning process is very simple and almost entirely involved in these two rules: alternate the growing and fruiting canes every year, which means cut the latter down to one bud and the former to four or five buds, and when the season commences in the spring of the next year, tie the new fruiting canes which were growing canes in the last year to the stake, and rub off the flower clusters from the new growing canes which were the last fruiting canes.

Suffice it to make still a few additional remarks in general, viz:

1st. Sometimes there will appear several adventitious or accessory buds upon the oldest wood of the vine which is generally called stem or stump; this occurs in the seasons following the first year. Rub them off, but leave as many as you want for the season—one, two, four, or part of them; train them instead of the shooting canes of the previous year, which are, in this case, to be entirely removed, for it is apparent and natural that the vitality of the vine is always most vigorous in the closest vicinity of the stem, and diminishes in the same degree as it gradually retires from the stock (stem) and its roots This is not only intended to say in regard to the stake system, but also to the training to trellises.

2d. Nearly four-fifths of the vine are cut down every year, in order to allow in full the food from air and ground, which the thus doomed portions of the vine would require for their livelihood, to the remaining one-fifth—a process which is enhancing its growth and vigor.

3d. Old wood is to be cut down as much as possible.

4th. Have the fruiting canes always tied to the main stake and in the closest connection with the stem.

5th. For ties I would recommend bass wood, willow twigs, the yarn of old coffee bags, and, in want of these materials, every common string except woolen yarn.

6th. Vine trimmings being very good manure, since they are homogeneous to the mother vine, leave them on the ground between the rows and vines.

7th. If a man wants to particularly shelter his young vine, and thereby promote its early growth and vigor, this can be done either through two boards, one foot wide and eighteen inches long, forming a right-angled triangle, its board sides facing North and West, or three boards forming a square, the open side of which facing southeast, or finally an open box without a bottom. I don't think this kind of shelter necessary for field culture, but it may be of some use in gardens which are not well sheltered from northerly and westerly winds.

8th. During the growing season, the soil between the rows and vines ought to be kept free of weeds, grasses and other plants, (to the latter, potatoes, strawberries, turnips, &c., may be exceptions)—therefore clear the ground. But since the ramification of the roots and rootlets after the early part of June reaches a point only three inches below the surface, and it being very injurious to disturb them, only the surface should be stirred or skimmed, and this no later in the season than up to August 1st.

9th. In November, when the growing season is passed, and it is no more so damaging to disturb the roots a little, I think it advisable to plow between rows from three to four inches deep, and, at the same time to turn the furrows toward the vines, which will also protect them through the winter.

10th. These are the necessary vinticultural implements: plows, cultivators, square hoes, two tongued hoes, for strong and tenacious soil, one tongued, triangular and pointed hoes for stony soil, many pronged potatoe diggers for heavy soil, and finally, sharp pruning shears, scissors or knives. In conclusion I would state that I, like a witness in court, thought myself bound to "say the truth, the whole truth, and nothing but the truth," upon this very difficult subject. Since I am fully convinced that a certain *embarras de richesse* would be as embarrassing to laymen vine growers in future as certain very learned essays on the same bewildering subject have proved to be in the past.

Explanation—The rubbing off of buds and flower clusters, wheresoever it may be mentioned, is always understood as only to down to two leaves of the growing cane.

C. Trellis Training and Pruning.

The trellis system is, methinks, not very recommendable either for the field or the culture of wine grapes, but for the garden and

fruit grape culture only, and particularly so on the south and south east sides of houses, walls or board fences. It may give a good table or raisin grape, but it shows a good wine grape nowhere, because *high* hanging grapes are too far removed from the soil upon which they needs must draw for their want of acids. At the same time it is apparent that the trellis system is preferable, nevertheless, in an ornamental respect, because every man with a little common sense is able to train and draw the shoots, canes, laterals, arms, and branches of the vine in any direction and to give the whole ornamental shape and form. It is therefore not necessary to subpœna a score of different intricate systems, such as the Speechly and Hoar methods, and others, but it is much more natural, I beg pardon to suppose, to explain to him in brief only one system, and for the balance to leave him alone with his own common sense.

The system which I want to show is the oldest, and, after all, the most efficient too; it is the original Thomery system, so named after a village near Paris, France, over one hundred and fifty years old, and, of course, from time to time improved by thinking vine growers. Before entering upon its detail, however, I would state that training to trellises involves a tendency of the vine to cluster its leaves; this ought to be prevented through equally distributing its canes, for every leaf wants its sunshine and air and will perish in a shady place without airiness. The stake and slat system is, in this respect, more preventive, by the by.

1st. For garden trellises take stakes of good durable timber, set them six feet apart in rows running north to south, five feet above the ground, and draw four wires from one to another at intervals of fourteen inches; 1,250 pounds of No. 9 wire is required for an acre. First year, one cane—avoid all severe pinching and pruning; second year, two canes—in fall cut them down to three eyes each; third year, six canes—stop them at the end of the trellis, cut three canes down to two buds each, and the balance to about three feet long; fourth year allow six canes to grow from the two eyed, for fruiting, and branch the three-footers; in fall cut the fruiting canes to one or two buds, and the branch canes to three feet each. Every following year four to six strong fruiters may be grown from the buds of the growers of the previous year.

2d. For house or wall trellises take strong posts of suitable height, place them at eight feet distance and connect them by hor-

izontal wires, or better, laths. Dig the trench three feet deep and ten to twelve feet wide, clear the soil of weeds and other obnoxious plants, feed the border with thoroughly mixed stable manure and wood ashes, pulverize the whole feeding soil, and plant the vines one-half foot from the wall, which done, the sidewalk, *i. e.*, the border may be flagged, because it needs no further working in time to come. In the first season the canes, one to each vine, are to be kept upright and well tied, and two leaves are always to be taken off the latterals, when they have grown. The canes are to become strong standards afterwards; the arms can be horizontally laid at convenient hights and the lowest of them high enough not to interfere with the sidewalk passage; but only one pair of arms is to be branched off from one vine. The upper arm-shoots should be shortened, but the under arm-shoots rubbed off entirely, as soon as they appear.

The former are alternately single and paired, the latter of which spring from two buds bedded in the axil or arm-pit of every leaf, one of which is visible and the other scarcely discernable. In order to get directly opposite arms, the standard or main canes (each vine is to have one) ought to be cut off at a convenient height above a leaf in the axil of which the visible and dormant buds are secured. The former will shoot forth immediately, as soon as the growing season commences, and the latter the next year, or right away, if the cane which sprung from yon visible bud be stopped and not allowed to bear even a single leaf; if it be allowed to grow, it takes, of course, the sap from the dormant bud, and this little embryo is prevented from growing. The Thomery method reaches its highest degree of perfection in the *triple system*, which is as follows, viz: Take six standards, the first and fifth to form the lower arms, the second and fourth the upper ones, and the third and sixth the middle branches. It is said with some authority that under the management of this system the fruit ripens earlier and keeps later, even until December.

But, after all, general directions for stake training and pruning are applicable, as far as they are not conflicting with the above; also to trellis training.

D. Conclusive, Hints, &c.

1st. The sun is a fountain of life to the vine.

2d. The air is its best Long Branch or Saratoga Springs.

3d. The lap of the maternal earth is its all satisfying home, if her chief homestead laws be chastity and labor.

4th. In a sanitary respect, the vine is like man; keep its feet (roots) warm, and it generally remains healthy.

5th. Roaming and roving is perilous; let the vine stay nearest to its home, or it will become a vagrant and pauper in a short time.

6th. Grapes are like children; bring all of them uniformly up to perfection, and don't send them too far away from home (the stem) before they have attained age.

7th. Haughtiness is no virtue; the largest bunches of grapes would hang on the highest branches, indeed, but the most delicate fruit is borne by the lower ones; this is a practical illustration of the famous "stoop to conquor."

8th. A man who wants to master the subject of vinticulture thoroughly, ought to have a clear insight into the very nature of the vine and its system, or else he will be like the infidel who derides God and religion, because he knows them not, nor himself.

In concluding this subject I feel obliged to thank my father, J. P. Preyer, Esq., proprietor of the Lake View Wine Farm, the largest in the State of Ohio, for a great many practical hints and explanations inserted and spread all over this essay.

VII. Propagation.

There are five different methods of propagation, but only two of which I expect to recommend in the first place; these are the cutting and layering methods.

1st. *Cuttings* are prepared in fall from well ripened wood, of three buds each, which are not to be injured, and cut down to an inch above the upper bud, and close up to the lower one. During the winter keep them out doors under a slight cover of soil and straw. Cool temperature and a little moistness is required, In spring dig sloping trenches, ten inches deep, and put the cuttings in six inches apart, so that the center point between the two upper buds be visible at the surface of the ground, which is to be well pressed down, and covered with coarse litter. Canes of 3–5 feet long will grow during the season which are to be tied up to stakes or

made to climb upon pea-brush. Having been covered up during the second winter, they may be planted the next spring. The Diana and several other improved varieties cannot be propagated this way.

2. *Layering* is the second of the principal methods. About July 1st, select a vigorous shoot of a vine, bend it down to the ground, and at the point where it touches it, cut it from the upper side half way through, then place the shoot's tip into a hole three inches deep, fill it up and press the soil well down. Detach the shoot at the half cut after seven or eight weeks, when it has rooted, and set it out or leave it alone, wherever you want it, but early enough to become established before winter.

3. *Grafting*, so familiar with the ancients, and only different from layering in splitting, instead of half-cutting, has now become nearly obsolete.

4. The propagation from *single buds* or *eyes* need a hot-bed, and is the nurseryman's favorite method. Cut the cuttings in spring in two, and leave one-half inch of wood below, and three-fourth inches above the eye. Fill a box three inches deep with clean sand, put the buds in a slanting position, their tops looking towards the surface, at two inches apart, cover them up with sand and press it down firmly. The second week of March is the most suitable time for this work. The sand ought to be kept moist. Transplant the young vines when three inches long, into another hot-bed made of ordinary soil, and set them out doors when the weather has become warm and settled, but, mind you, they need shade in the hot sun, and when dry. The Diana can be propagated this way.

5. The propagation by *seed* is uncertain, but necessary for getting new and better varieties. It is experimental altogether. Take thoroughly ripened seed from the best varieties, and sow it in the fall into a bed well worked and mingled with leaf manure from the forest; sow it pretty thickly into drills fifteen inches apart, and cover it with soil of one-half inch thickness. First spring—when three inches high, thin the young plants to three feet apart in rows, mulch them with coarse litter, and cover them with pea brush to climb upon. Second fall—cut off the roots to 6–8 inches, and prune down the stem to two buds, then heel them in for the winter. Second spring—Transplant the seedlings to become vines. Third fall —handle them in accordance with the general training and pruning rules. Third growing season—allow only two canes to grow, one of

which will bear fruit. None of the seedlings will be found like their parent, a great many inferior, and only some superior. Destroy, if you want to, the inferiors, and give the superiors a fair trial. The Iona was such a superior seedling. Sometimes people try raisin-seeds in this manner.

Hybridization belongs under this heading. The process is as follows: Impregnate the flowers off, for instance, an early and hardy vine of poor quality, with the pollen of a tender one of good quality, and sow the seeds in the manner above mentioned.

For the rest, it is remarkably easy to propagate the vine, and there is no plant all over the vegetable kingdom which is its superior in this respect.

VIII. Diseases of the Vine, Etc.

Diseased or distempered *plants* are incurable, and feeble parents have feeble children, therefore, every plant, be it a cutting or a bud, should be taken from a strong and healthy mother vine.

Diseases are occasioned either by external or internal causes, or to speak more plainly, by insects or decay, in most instances both working together, and all of them coincide in destroying the vine or its fruit wholly or partially. Mildew, some insects and rot are the worst enemies of the vine.

A. Mildew.

The mildew, or Oidium Tuckeri, is named after Mr. Tucker, a gardener at Margate, England, where it first was observed in 1845. Thence it spread all over the vineyards of Europe and America.

The naturalists did not agree yet upon the real cause of this wide-spread disease, by which the Catawba, however, is least effected. I propose the following hypothesis, viz: The father vines cohabit with the mother vines by semination through the air, especially in dark, foggy weather, when the atmosphere loaded with vapors is dense enough to carry the light pollens of the former to the latter upon which they settle down in the parasitical form of mildew. Perhaps this pernicious disease is of a fungous nature though.

Mildew softens the skin of the leaves, and is disposed to appear in May, when they are well developed. Feeble health of the vine, unfertile, too rich, too shallow, and too wet grounds, too crowded leaves which, by overshadowing one another, would prevent the action of the sun upon them, a location too close to a sheltering wall or fence, and too near each other, the proximity of trees, particularly pear trees, sudden changes of weather, rainy days, scarcity of light, dense fogs, and a motionless atmosphere; all of these are as many allies of mildew.

Pulverized, dry sulpher brought into slow combustion by the rays of the sun. is a remedy invented by Mr. Mares, of England. It would be strewn upon the under side of the leaves which are chief ly beset. Moist or course sulpher, which is void of action, is useless. Sulpherizing often is needed a second time in June, but very seldom in July.

B. Rot.

The rotting of the grapes is most successfully prevented through following my advice in regard to the preparation and choice of soil, propagation, planting, training, pruning, and the cure of visible diseases of the vine, since there has not been a specific found out as yet.

C. Insects.

1st. The *Fidia*, a brown haired beetle, one inch long, appears in June and July, particularly on the Concord and Norton's Virginia, and eats oblong holes into the leaves. Touch the shoots or canes and it will drop.

2d. The *Grape* or *Berry-mot*, a little, many-colored butterfly, lays eggs into the half grown berries; small vernias creep out after a while, and eat their way through berry and seed. This mot appeared five years ago in Ohio, Pennsylvania, Illinois and Missouri. Shy it away.

3d. The *Vineroot-worm* is over two inches long, and of a white color, has a black head, and eats the roots of the vine; it hails from rotted and hollow trees, which are, therefore, not to be allowed in the vicinity of vineyards. Kill it.

4th. The *Tyrale* winds the young shoots with "silk" and eats the leaves. Unroll the shoot, and take the insects out.

5th. The *Red Spider* appears in vineyards during the very dry weather, especially if pear trees are in the vicinity, and is very troublesome. Sprinkle the vines with whale oil soap suds, one-half pound of which solved in 6-10 gallons of water.

6th. The *Quaker bug*, drab-colored, with a row of dark spots on either side, also belongs to the inimical host of insects. Take it off.

7th. The *Brown Aphias*, a very small insect, sucks the juice of the young shoots. Wash it off with a sponge, or take it off with your hand.

8th. Of the *Caterpillars*, the large green, naked spinner is the worst. Pick it off

9th. The *Rose bugs*, little beetles, which don't like the Delaware, however, can destroy a whole vineyard. Pick or knock them off, or strew some dry ashes upon the leaves.

10th. The *Flea beetles* burrow in buds, and girdle the tips of tender shoots. Treat them like rose bugs.

11th. The *Leaf-hopper*, last but not least, is the most mischievous of all the insects inimical to the vine. Being very small and of a light green, it is scarcely perceptible. It flies and leaps, appears early before the end of May, and stays until the end of the season, particularly clinging to the under sides of the leaves. Sulpherize them; tobacco smoke is destructive to the vine.

But finally, and after all, I cannot avoid reminding that there are no better destroyers of the above mentioned insects than *birds* of every description.

IX. Ripeness of the Fruit.

Our native grapes never reach *perfect* ripeness. As long as there is any acidity in their skin and pulp, the ripening process is not accomplished yet. Transparency indicates what we call ripeness. The dark kinds become deeply colored in their course of ripening. But these and the following are merely hints, and taste remains always the highest authority upon the subject.

The Delaware comes nearest to perfection; its pulp becomes sweet to the center, if not exactly melting, and its skin very thick, very little fibre remaining. The Diana is of a similar character,

but its skin remains thicker and its pulp more fleshy. The same is the nature of the Israella. These three varieties ripen to the center, whilst the Iona commences ripening at the center, and nearly reaches perfect ripeness also.

But all varieties ripen according to their location and age, and the general conditions of the weather.

Some kinds commence in some localities to be ripe in August, others continue until November, and are not injured either by snow or frost; this is to say of all good keepers.

August 15.—The Adirondac.

August 20.—*September.*—The Israella.

September 10.—The Diana, Crevling, Martha, Pauline, Lincoln, Delaware, Hartford, Prolific and Wilder.

September 15.—The Herbemont, Concord and Clinton.

September 20.—The Elsingburg, Iona, Rebecca, Ives', Seedling, Allen's Hybrid and Eumelan.

October.—The Anna, Catawba, Union Village, Isabella and Cuyhoga.

October 15.—Norton's Virginia.

X. Gathering and Keeping of the Fruit.

The best time for gathering grapes is a dry day, when there is no dew on them. Cut with a pair of sharp shears or scissors through their pedicles, cut out the wormy, imperfect or green berries, don't remove their bloom, and place them carefully into pails or baskets. The gathering of several well keeping varieties can be done as late as in November.

For wine making purposes it is necessary that the berries hang long on the vines, in order to dry up a little.

If the grapes be gathered early in the morning with dew upon them, and intended for table purposes, they are to be placed upon crates, and for two days, during which they must be often turned, next exposed to the air, and during the night hung up in an airy, covered place, the sides of which are open.

For storing table grapes, a room on the northern side of the house, which is under no influence of fire or sun, and keeps a pos-

sibly uniform temperature of forty degrees, a dry atmosphere, and immovable air, or a dry cellar without funge, and with a little ventilation is recommendable. In ventilated rooms grapes become raisins, and repeated freezings are injurious to them.

Have the grape bunches here either separately hung up with wire hooks on hoops or frames with movable bars, or put into boxes in three or four layers, with sheets of paper between them, it being recommendable to line these boxes also with paper. When frost sets in, cover them entirely by closing the lid, and during extremely cold snaps spread a bed-quilt over the lid for protection. But it is also necessary to examine them now and then, say every fortnight, and to remove all defective berries.

The Delaware lasts, if kept with some carefulness in this manner, until February, and the Isabella, Catawba, Anna, Diana, and Israella are said to remain in a pretty good condition even until April.

XI. Use of the Fruit.

The use of grapes is twofold. They are used either in their natural condition as table fruits or manufactured into wine, raisins and preserves. In the foregoing chapters of this essay I have hinted which varieties are most suitable for one or the other of these purposes.

1st. It is not now my design to explain the different methods of manufacturing *wine*, because this would go far beyond the intended limits of this book. Perhaps the time may come, however, when I am happy enough to find leisure for writing a second volume entirely devoted to this very important subject which becomes from day to day more popular, without being yet fully understood in all its branches and national economical ends.

2d. As for the *table grape*, it will be sufficient, I presume, to refer to the remarks broadcast all over this first part which treat of the best selections for this purpose, and the keeping of grapes during the winter season. As yet, the Catawba is the best variety for export, and readily finds its market; grape-growers express it best in

small crates of lath, lined within with brown paper, and compactly packed up with whole bunches and some single berries to fill up the vacancies.

3d. For making *raisins* it is required to gather the grapes on a dry day, then to spread them for a few days on crates exposed to the sun, afterwards to dry them on fruit-kilns, and finally to finish them in an oven. Experience will result from several experiments and be the best teacher in the future.

4th. For the making of *preserves* or *jellies* I give here the following recipe: Take a well cleaned tin kettle or can, without the least grease inside; pour a little water into it, and then fill it up with grapes; place it on a stove fire, and let it come to boiling, but stop it as soon as it commences to bubble. Then mix the grape juice, which is obtained by putting the grapes in a bag, and straining them, with good white sugar, by taking a pound of it to a pint of juice; let this mixture boil for twenty minutes, and put it, before it gets cold, in glass cans, with well closing tin lids, which are to be kept in a cool place, but without exposure to freezing.

XII. Conclusion.

It is a fact beyond every reasonable doubt that the investment of capital, be it large or small, in *land* is much safer than any other speculation in stocks, or even industrial enterprises; and, on the other hand, it has been shown to evidence that the accumulation of land in one owner's hand involves the greatest agricultural sin of this country, but poorly coefficient as it is in developing her rich resources.

Speculation in stocks, nowadays as rampant as seductive, shows a good many pecuniary wrecks all over the land. Contrary to this, the passion of the Europeans to become land owners, surely ought to be considered an agricultural virtue worthy of being attained by every American. Husbandry is the most solid foundation of any state or union of states, be it a republic or monarchy. Morover the soundest family life has its homesteadly abodes in the country, and christianity and humanity thrive their purest blossoms on a husband's farm, So much for the high praise of agriculture.

Sound husbandry requires the possibly greatest improvement of every acre of soil in possession of a land owner, and experience proves it to be a matter of fact that *small* land owners proportionally contributed more labor, skill and efficiency to the culture of the American soil than *large* real estaters, because they are naturally compelled to raise the rentability of their few acres to its utmost, for a livelihood.

Now the culture of grapes, as well as the cultivation of small fruit, apparently is more profitable, I should think, than any other branch of husbandry. A statistical annotation, for instance, shows an average harvest of 9,000 pounds of grapes per acre for the fifth year, and a net profit of $250 yearly from the same acre, and finally that one hand can work very well five acres, perhaps with a little assistance in harvesting.

The wild-growing grapes and vines of this country, besides which are found everywhere except on sandy grounds, are as many natural hints to what kind of husbandry the land owner should choose. So I close, brother husbandmen, with this admonition, *Try a few vines, try a few acres for vines.*

Part II.

SMALL FRUIT CULTURE.

PREFACE.

FARMERS have no secrets, says the author of "Ten Acres Enough," (James Miller, New York, 1865,) a middle sized book, the most attentive perusal of which I would recommend to every land owner, and he is in this respect, as well as in so many others, perfectly right It was the very maxim which benefited me myself a good deal, and thus being one of its numerous patentees, I thankfully impart to others, for their benefit, what I have learned of small fruit culture during a decade of practice under the guidance of my venerable parent, and, at the same time, pay my filial respect and duty.

No land owner whatever should be without small fruit growing, and cultivating one or the other of its branches, at least for his own *family use*, In summer there is, I guess, no more agreeable dish than a plate of strawberries, raspberries, grapes, etc., and in winter, perhaps no greater table relish than that afforded by small fruit preserves. Besides, last but not least, everybody ought to know that small fruits, grapes and vegetables prevent fever and bowel complaints, which are only too often induced by eating too much meat in the warm season.

On the other hand, I cannot recommend the cultivation of small fruits *for export*, but only to such land owners as live in the vicinity of large cities, or railroad stations where way trains stop and would take their baskets and boxes on board, or steamboat landing on navigable rivers and canals, which connect their regions with one or

two principal market places, or seabord harbors situated on the track of transatlantic steamer lines. New Jersey stands foremost among the States in this respect;. Virginia and New York are next.

Far off from the great commercial, industrial, or political centers, particularly at the far West, where, by the-by, the poor farmer is so heavily taxed, not by the township, state and federal authorities, but by greedy monopolizing railroad companies whose excessive freight tariffs seem to be as many unconstrainable impositions, that, for instance, at the very moment of my writing this little volume, the westerly settlers of Minnesota and Nebraska are compelled to take the nondescript price of ten cents per bushel for their No. 2 Indian corn, whilst it brings in the market of New York 67 cents. Well, at the far West small fruit growing for export would not be well done to advise, and the farmer better confines himself to cultivating a nice selection for family use only.

Twenty years ago our principal markets being stocked chiefly with berries from the woods and roadsides, small fruit culture surely is not very old yet in this country, but since it is apparent that the net profits of one acre in small fruit sometimes amount to as much as ten acres in corn, wheat, rye, or oats would bring, and since barren New Jersey was seen to become a rich garden under the blissful hands of her laborious fruit culturists, it has rapidly become more general, and I presume those farmers in the Eastern, Middle and Western States, (those at the far West excluded, however,) who are still without berries in their gardens and fields, to be in a Horace Greeley minority.

But, nevertheless, small fruit growing should still become more general. It repays labor and land, unless you neglect making constant war upon the hosts of weeds, and calling to mind the old English proverb,

One year's seeding
Makes seven years' weeding,

As for soil, every kind of it except totally barren grounds and those which are constantly under water, can be adapted to berry-culture, particularly so by means of careful labor and rich manure.

Now, a husband who wants to refresh himself, his wife and children, as well as every kinsman and employee belonging to his household during the hot season *without interuption,* with all kinds

of berries, one after the other, should raise strawberries, raspberries, blackberries, currants, gooseberries and grapes, and his supplies of fresh fruit will never give out before the ends of the season.

Finally, not much scholarship is wanted for this purpose. Common sense, together with incessant labor will give the victory over every obstacle and any disappointment, and the ends attained will be plenty of greenbacks in your wallet, or plenty of luscious fruits upon your table, or both. Therefore go ahead, husband.

Berries versus Alcohol.

Just now the *temperance question* is up before the country, and it is apparent to every thinking man who is not blindfolded with contagious prejudices, that it needs must very soon become burning, since the annals of our criminal courts show to evidence that the rum shop is a, perhaps *the*, principal source of crime, and our poor houses read whole chapters on the delapidation of family fortune because of pater familias being a habitual drunkard. But, methinks, our temperance societies, although their endeavors to check the evil must be considered as good in a general view, go too far indeed, and their practice does not at all appear right well to the point. Some of our license laws are even monstrous, and instead of hitting the bull's eye, go amiss, *i. e.*, beyond the aim.

The human tribes of this post-deluvian world since Noah have enjoyed their fermented beverages without being much injured in their physical systems. Barbarism, semi-barbarism and civilized nations put their feet in the footsteps of their ancestors, as far as this matter is concerned. Our Savior did not dislike wine at Cana, although he may have baptized it a little with water, instead of fire; the old Egyptians, Hebrews, Persians, Greeks and Romans were found of the fermented or natural juice of vine grapes; our German ancestors enjoyed their beer long before Julius Cæsar crossed the Rhine; indeed every historical nation reads a lecture to our temperance apostles well worthy of being listened to, in stating that the prohibition of all beverages, except pop and water, is unquestionable nonsense. Moreover, every sensible physician of our day will affirmatively testify to the truth of the following maxims, viz:

everybody, and the working men in particular, now and then wants a stimulation, and hilarity, induced by a moderate use of poisonless beverages, is a promoter and improver of health.

On the other hand, the members of the temperance societies are perfectly right to step into our legislative halls, and make war upon all *poisoning liquors*, but I cannot see that good beer, ale, wine and cider belong to this class. To be sure, I cannot avoid putting all adulterated and drugged beverages on the same index, but, at the same time, I beg pardon to advise the extremists, although uncalled for, that they better follow the example of the old Fatherlandish temperance societies, which prohibit the use of whiskey, brandy, arac, rum, and all compound liquors only. This, meseems, is the only possible road to victory, *i. e.*, to conquer the seemingly indomitable inclination to imbibing distilled liquors to excess. Preventive measures against the yellow jack and cholera-morbus are not found to be out of order; the sale of poisons is restricted and limited; why should not the prohibition of *all poisoned and drugged liquors* involve a sound sanitary policy?

Moral powers and influences eventually don't suffice to uproot the inveterate intemperance in regard to the use of all kinds and brands of benzine, and they are as powerless against those liquors as against murder, adultery, theft, robbery, burglary, misdemeanor, and other crimes. Therefore, the State by way of legislation is not only entitled, but also, I think for one, strictly obliged to bring her authorities to bear upon the question.

I expect now to show that all *distilled* whiskies and compound liquors are poisonous; be it said, at the same time, however, that all *fermented* drinkables, such as wine, cider, ale and beer, are not at all, or, at least, in so small a degree that their moderate use may be judged entirely harmless, particularly so, if they have gone only through upper-fermentation, (beer vacillates both ways).

When, some centuries ago, a reverend physician of Southern France invented the distillation of spirits, he designated them to be by the Latin name of aqua vitae, *i. e.*, water of life, a medicine only, and liquor remained for a long time in this harmless position, since imbibing it to excess is of a recent date. Now, it is a fact that fermentation developes no venomous matter, but distillation does, and another fact is that wines contain much less alcohol than liquors. Hock, for instance; contains one-half spirits, Madeira one-eighth,

whiskey one-third, rum, arac and compound liquors even two-fifths to one-half. Besides the vinous acid of the wine neutralizes its spirits, whilst, on the other hand, *all* distilled liquors needs must contain a certain quantity of rot-gut oil and copper salt, both of which ingredients are not less poisonous as morel and opium; so said Hufeland the late famous and popular German physician.

All these pernicious ingredients together irritate and finally destroy the nerves, impair digestion and appetite, check man's spiritual powers, kill the last spark of sensibility for the good, holy and divine, promote sensuality, feed everything beast-like in man, destroy the image of God, together with every sound plank in the platform mankind has been placed upon ere now under the heavenly shelter of state, church, society and family, lead to irreligiousness, immorality and discontentment of every description, and finally to mania potu, suicide or homicide, to the poorhouse or penitentiary, in one word, on the devil's road to hell.

Therefore I most cordially agree with every temperance man in checking the evil done through distilled and drugged liquors, but, at the same time, I dare say that the evil done by these extremists who declaim against the use of all, even fermented, liquors, in an indirect regard is almost as great as that directly committed by habitual drunkards, because they would thus deter a host of well-meaning sensible men from being or becoming coefficient in their noble task, by participation.

Those extremists don't seem to know, or even be willing to learn, that berries, be it vine grapes or small fruit berries, are the most valuable allies in their raid upon distilled liquors which, by-the-by, are nowhere worse and more full of foul play than in America, and, yet those innocent berries are pioneers of temperance right to the point.

Small fruit of every description can be made into wine *without the addition of spirits.* Mr. J. P. Preyer was, as far as I know, the first American who introduced such genuine and pure berry wines into the market for sale. This was in 1869, and since that time it has been shown that they are marketable. Now I ask, can any sensible temperance man have an objection to these innocent pure juices? I should think not. To be sure, I don't expect to appeal to a certain half-crazy associate judge of Indiana county, Pa., who some years ago, had his apple trees cut down, in order to prevent their fruit from being made into cider, certainly not.

Pure berry wines are, like unadulterated grape juices, beneficial and not injurious to mankind. Every learned naturalist and good christian will say so. So did Charles Linne, (1707—1775,) the great Swedish naturalist and botanist, who cured his rheumatism and gout through drinking strawberry wine freely, and eating strawberries plenty. So did Oliver Goldsmith, the famous rover and English poet, in his "Vicar of Wakefield," published in 1766, and so do the sober and industrious Dutch Pennsylvanians who, probbly induced by the recommendation of the Philanthropic Society of Philadelphia, in 1771, imbibe their home-made currant wine since a century.

Therefore, ye friends of human welfare. I put the heading of "Berries vs. Alcohol" over this chapter. And now if you want to "put a head" on that big, overgrown, national American passion of imbibing poisonous fluids in large killing doses, *don't be extremists!* Les extremes se touchent. Mind you, that habitual drunkards can be saved by total abstinence from drinking distilled liquors only; they *can* stick to such a pledge of *total abstinence*, but they *cannot* as it is, keep their promise of *temperance* after the extremist fashion. I conclude this chapter with a quotation from the bible, since I am full aware that our temperance men like to settle down upon the solid rock of that holy book. St. Paul wrote in his apostolic letter to Timothy, (I. Tim. V. 23,) "Drink no longer water, but use a little wine for thy stomach's sake, and thine often infirmities."

To whom is St. Paul *not* an authority in such matters? Or are our contemporary disciples of the great gentile apostle wiser than their master, and even Jesus Christ, the changer of water into wine, at Cana, in Galilee?

I. The Strawberry.

Strawberries are widely known, and there is perhaps no kind of berries which has been more successfully raised all over the country. They are the first and most delicious of our summer fruits. Any soil good for potatoes and corn, is good enough for them, and I dare say that a bed of strawberries is no more trouble than a bed of potatoes. All classes of society relish this luscious small fruit, and it is a matter of fact that it contains sanative powers. Only remind

Linne. Its acid is pleasant, and compounded with the aromatic bitters of its seed, this blissful fruit, either in its natural condition, or made into wine or jellies, must be considered a remedy in several cases of disease.

Strawberries are either bi-sexual, *i. e.*, perfect, or pistillate, but I cannot recommend the cultivation of the latter, because they must be grown together with bi-sexuals, whilst these can be grown alone. There has been much ado about the sex of strawberries, until finally the natural principle of "no seeds, no berries," was found out to be true.

In addition I will say, that strawberries belong to the large family of roses, and, like these, are most injured by weeds In order to theoretically assist in keeping them aloof, I expect to remind the reader of the old golden rule,

Let no weed,
Go to seed,

A. Varieties of the Strawberry.

The strawberries are naturally divided into the two principal classes of Bi-sexuals and Pistillates, and their varieties are very numerous.

I. Bi-sexuals.

1. The *Boston Pine*, or *Bartlett*, introduced by C. M. Hovey, of Boston, Mass., a good and early market variety, has very long fruit-stalks, and grows well both in heavy and light soils. Berry large or medium-sized, conical form, light crimson color. Flesh slightly colored, firm, sweet, and excellent. Plants very vigorous, productive and hardy. Its flavor is unexcelled, particularly for amateurs.

2. The *Agriculturist*, originated with Seth Boyden, at Newark, N. J., through hybridizing the Green Prolific and Peabody's Seedling from Georgia, in 1863; is grown in every soil, on enormous stools, was formerly called the "Queen of Strawberries," but after many years' experiment and trial it was found out that in warm weather its fruit fast decreases in size, its flesh becomes infirm and loses of its original flavor. Therefore, and because the berries are rather soft for transportation to a distant market, its cultivation has not proved very profitable. Fruit very large, light reddish, conical, with long neck. Flesh deep red, sweet, and rich. Leaves large, thick and dark.

3. The *Brooklyn Scarlet*, originated with Andrew S. Fuller, at Ridgewood, N. J., in 1859; got one of the three New York *Tribune* prizes, and is considered the best among its equals Fruit bright scarlet, medium-sized, conical, with neck. Flesh sweet, rich, rather soft, and highly flavored. Plant a dwarf grower, but very hardy, vigorous and productive, with a very large stool. For home use the best variety.

4. *Downer's Prolific*, originated with I. S. Downer, at Elkton, Ky., was a long time considered as the most profitable market sort, only equaled by Wilson's Albany, and famous for its extreme hardiness and early crop; planted in hills, it is also enormously productive, and its berries reach double the size of those raised in rows. Fruit round, medium-sized, light scarlet. Flesh rather soft, acid and highly perfumed. A certain yielder every year

5. The *Green Prolific*, or *Newark Prolific*, originated with Seth Boyden, at Newark, N. J.; was a pretty long time a good deal thought of, because it can stand the coldest winters and hottest summers, but its medium-sized, round, orange scarlet berries are very sour and far inferior to the Wilson ; their flesh is too soft, and although the plant is vigorous and grows in light soil, this variety must be pronounced worthless. Late.

6. The *Lady Finger*, originated with Benjamin Prosser, at Burlington, N. J.; is an excellent variety of delicate flavor. Fruit large, elongated and brilliant scarlet. Flesh very firm and good. It is as hardy as vigorous and prolific.

7. *Wilson's Albany*, originated with John Wilson, Albany, N. Y., one of the oldest, widely reputed varieties, one of the pioneers of strawberry culture; is still at present as to quantity the principal variety in the New York market, although it is too sour but for culinary purposes. Dry weather is injurious to it, and decreases the size of its berries. As a pretty reliable variety of much popularity which its badly mixed condition hardly deserves, it is grown everywhere, all over the country, but it requires a frequent renewal of its beds. For canning and preserving it is the superior of all. Fruit large, conical, very acid, dark crimson. Flesh tinged with red. Yields enormous crops, but not early in the season, since it commences ripening no sooner than about June 7th.

8. The *Jenny Lind*, originated with Isaac Fay, in Massachusetts, is one of the earliest sorts, very reliable as a fruiter, and

therefore valuable for market and home use. Fruit small to medium, conical, rich crimson. Flesh finely flavored. Plant admirably hardy.

9. The *Triomphe de Gand*, the most extensively cultivated foreign variety, introduced not long before 1858, is grown only in hills. Imported from Flanders. It does surely not grow everywhere, particularly not in very light soil, but where it was grown and had plenty of sunlight and air, general satisfaction was the result. Heavy mulching in warm weather is required; no runners. Fruit very large and uniform, sometimes five inches in circumference, irregular and often flattened, coxcomb-like, bright crimsom, late, keeper. Flesh deliciously flavored, firm and crisp. Plant thrifty, hardy and a vigorous grower, retaining its full, beautiful color and firmness. It is very good for distant transportation, and commands a very high market price, double that of the Wilson. Received two New Jersey prizes in 1862 and 1864.

10. The *Jucunda*, perhaps the most excellent of European varieties, was cultivated with great skill and care, particularly by I. Knox, at Pittsburgh, Pa., since 1860, and goes also by the name of *Knox's* 700. It was introduced in 1865. Fruit conical, very large (sometimes ten or twelve fill up a pint measure), bright light crimsom, bristling all over with golden yellow seeds Flesh white, pale salmon centre, firm to the centre, excellently flavored, rich and juicy. Fruit stems stout and stocky, bear well up their berries. Being a good grower, it does not require more care than other varieties to which I think it in many respects far superior. Almost every blossom forms fruit, hence its great productiveness. I highly recommend the Jucunda for family use and transportation, since I experienced its keeping well. At Lakeview we raised a specimen of five inches in circumference, grown in a rich, deep, well-drained clayey loam, in an undulating, almost hilly region. John H. Jenkins calls the Jucunda "the prince among strawberries," and I think him perfectly right. In the market it commands the highest price. Plant it in heavy soil.

11. The *Sterling* is a new and valuable variety raised with Mr. Crawford, at East Cleveland, Ohio, which grows in any soil and is very productive. Fruit very large, crimson, firm and of good flavor. This variety is hardy and prolific, and warranted to be su-

perior to the Wilson and Agriculturist. Messrs. Mongrief & Lodge, at Cleveland, Ohio, are sole agents for Sterling plants. The first two year old plants were sold in 1873.

12. The *President Wilder*, introduced by Col. Wilder, President of the American Pomological Society, belongs to the Alpine or Wood Strawberry kind, is a late variety and called the "prince of strawberries." It withstands heat and cold, and is hardy, robust and productive. A single berry sometimes measures five inches in circumference and weighs over one ounce. Berries very large, conical, crimson scarlet. Flesh rosy white, very juicy, rich and sprightly flavored. New.

13. The *Early Virginia*, or *Large Early Scarlet*, is the earliest fine variety, vigorous and productive. Berries medium-sized, roundish, bright scarlet. Flesh tender and richly flavored.

14. The *Black Defiance*, recently introduced by E. W. Durand, of Irvington, N. Y., is a hybrid from the Green Prolific and Triomphe de Gand and was prized in New Jersey. Can stand any weather. Flesh firm and very aromatic. Plant hardy and productive.

15. The *Late Prolific*, one of E. W. Durand's hybrids, is a promising new market variety which received the first premium of 1870. Berries large, bright crimson. Flesh firm and sprightly flavored. Foliage dark green. Plants hardy and vigorous. Ripens late in the season.

16. The *Champion*, a seedling from the Green Prolific, originated with Robert Trumbull, at New Rochelle, N. Y., the giant among the strawberries, measures not seldom six inches in circumference, is globular and of dark crimson color.

Remarks—For a start I would recommend the Brooklyn Scarlet, Lady Finger, Wilson's Albany, Jenny Lind, Jucunda, Sterling, President Wilder and Late Prolific. Of the Pistillates the Fillmore is undoubtedly the best.

II. Pistillates.

1. The *Fillmore*, originated with Samuel Feast, at Baltimore, Md., is by pretty good authorities considered almost equal to the Jucunda, but requires under any circumstance deep, rich soil, and can only be grown in hills. Fruit very large, roundish, when ripe almost black, or dark crimson, as the Tartarian cherry, uniform

Flesh of exquisite flavor, sweet and rich, a pretty good keeper. Hardy and productive. Although popular in the market, it is not very popular with growers general. James S. Negley says of it, "It possesses all the good qualities of a perfect strawberry, and I am surprised that this berry is not more largely cultivated."

2. The *Hovey*, originated with C. M. Hovey, at Boston, Mass., in 1827, the oldest American variety under culture, is being largely grown in the New England States. Fruit very large, conical, light crimson, handsome and sprightly, a vigorous strong grower, requires plenty of room.

3. *McAvoy's Superior* received a $100 prize by the Cincinnati Horticultural Society in 1850. Fruit roundish, very large, with uneven surface and prominent projections, dark crimson. Flesh dark red, soft and sweet, juicy, rich and delicious. Pretty hardy to fertilize. Good crops are scarce.

4. *Russell's Prolific*, originated with H. Russell, at Seneca Falls, N. Y., in 1856, is a late blossomer and fruiter, and similar to the Superior, but not the same. Fruit very large, nearly round, irregular surface, bright crimson. Flesh lighter color than the skin, firm, sweetly flavored. Leaves large. The best quality grows in sandy soils. This variety is best to be planted together with the Jucunda and Triomphe de Gand, which are also late blossomers.

B. Historical Sketch.

The classic authors Pliny, Ovid and Virgil surely refer to small fruit, but not to its culture, and thus it appears that the ancients took their supply of small fruit berries from the woods and roadsides, only where they grew as savages. But since the commencement of the XV century, when garden culture became more general in Europe, strawberries, currants and gooseberries were grown in gardens also. In America people took to the same horticultural pursuits no sooner than forty-five years ago when the New Englander Hovey introduced the first pistillate strawberry variety, but its cultivation, and that of other kinds lingered in a certain degree until the better half of the instant century commenced its course on

the roads of progress at a double-quick cadence, and its development received a new impetus when the Federal Post Department finally took to sending plants, cuttings and seeds by mail.

As for kinds, the Alpine, also a native of North America and both Canadas, during the mediæval ages, was extensively grown from Greece to Scotland, particularly in France, England and Flanders. This kind of berry was already famous, in 1482, for its refined culture subjected to in the Bishop of Ely's garden at Holborn, England, where it was plentifully grown by the name of the wood strawberry.

About 1,600, the Virginian, most common in North American woods and fields, and renowned for its fragrancy and aromatic sprightliness, as well as long and wiry perennial roots, was introduced into England. Most of our own varieties belong to this stock. But in Europe it was superseded by the larger and sweeter South American, (grandiflora) which was found by the French traveler Frezier, near Quito, at the foot of the Andes, in 1716, and is at present valued highest in the transatlantic countries. In our latitudes this southern kind cannot stand cold winters and dry, hot summers; moreover in can be grown only in hills, because its tender roots always require fresh soil drawn up to them; hence its being neglected.

In 1809, Mr. Keen, of London, England, succeeded in raising the first pistillate strawberrry, and introduced it as the Hautbois; into his shoes stepped C. M. Hovey, of Massachusetts, in 1827, when he had originated a similar kind which he baptised after his own name, and fortunately managed to give a great impetus to the American strawberry culture.

Finally, what this famous New England horticulturist did by means of his excellent pistillate varieties, did some later John Wilson with his bi-sexual Albany, grown in the state of New York; and since that time refined strawberry culture has become more general and extensive than ever before, and yet strawberry culture was still, in 1860, when Rev. J. Knox, of Pittsburgh, Pa., spoke in a high tone of it in Cincinnati, so much behind time that this great horticulturist whom Hon. James S. Negley, M. C., of Shady Side, Pa., another horticultural scientist, call the "strawberry king," found only incredulous listeners. His strawberry exhibition, which every year in the month of June, occasions the conflux of all the

famous horticulturists of the Union, at the "Smoky City," is now, so to say, the standard and standard bearer of American strawberry culture. Vogue la gatere.

C. Soil and its Preparation.

I cannot help repeatedly saying that any soil rich enough to grow garden vegetables, or corn, will grow good strawberries also; sandy land, however, is preferable to heavy clay and light sandy soil; but, mind you, this kind of small fruit always falls in any soil a victim to neglect. Strawberries require much more moisture than grapes, indeed, but a wet underground necessitates under-draining, notwithstanding, and just so, as it is a fact that well prepared cooked food is much more nutritious for man and domestic animal than raw food, (nineteen pounds of cooked meat as to quality is not considered less than fifty pounds of raw,) so in the vegetable kingdom, a careful preparation of the soil is one of the principal requisites for growing fine crops. Neglect is the mother of failure, and not very seldom becomes apparent the average truth of the husbandly say, "too many acres, too little care." Neglected soil settles together, and neither sunshine, nor rain, nor fertilizing matters can enter. Drought is a perpetual danger and can only be turned away through deep plowing and thus keeping the strawberry buds constantly moist.

The soil chosen should be plowed, cross-plowed, and subsoiled to a depth of 16 to 20 inches, and, perhaps with the only exception of the rich prairie soil at the west, richly manured. Naturally rich soil don't want the same richness of manure as meagre ground; of course not, but it is still a general rule that faith in manure is, so to say, a good traveling staff on the road to success in strawberry growing, and a well-worked, pulverized soil the best border of each and every one of its varieties.

As to the different kinds of manure, I don't hesitate to state, or suppose that the "saint of the barnyard," *i. e.* the cow, is the best manufacturer, although it is but just to recommend the hog also. Old and thoroughly decomposed barnyard manure, especially if housed or covered, is the best fertilizer in our case, and if there should not be enough of it, mix one load of this dung with two loads of muck, leaves or sods into a compost heap which will require three months for its decomposing process, and ought to be turned over at least every month. It depends, however, upon the

kind of soil, to choose and apply the proper kind of manure. The above compost, with an addition of ashes, is good for sandy soil, and unmixed barnyard dung will work well in heavy soil, whilst coarse manures should never be applied to light soil, and as well ashes as lime never alone, but only mixed together with muck, or leaf mould, or both. Besides, mixtures of barnyard manure and ashes are not recommendable. Ashes, lime, spent hops, bran, castor, bonedust, guano, and superphosphate are beneficial additions indeed, and so are marl-manure, leaf mould and muck; every strawberry grower, however, should be careful as to their application. Leaf mould contains three times as much nitrogen as stable manure; a pinch of guano compost will feed a hill, and half a peck of marl-manure around each hill and some scattered around is excellent food for the whole strawberry tribe. After all, in every case experience is the mother of wisdom. Let an old farmer conclude this short lecture on manuring with his say, "feed the strawberry like a young pig."

In regard to location, open and airy grounds, because of their being possessed of less danger of frost, are preferable. For late varieties a northerly situation, and for early ones a southerly warm exposure should be selected any way.

Last, but not least, the entire and thorough extirpation of weeds is most peremptorily required. There is a host of them; wet weather and dry weather, cold weather and warm weather weeds, and I surely know that farmers sometimes would say, "it is as well attempting at killing weeds as flies, they don't harm;" but their say is not true at all. It is rather possible to kill the weeds in his garden or fields, if a man only don't allow them to mature a new crop of seeds, that is, if he destroy them before their ripe seed is self-sowing broadcast. Among others, the horse-weeder, which can be purchased at $6.00, is their greatest enemy, it cutting them off below the ground, and throwing them up to wilt. But if he should want to resuscitate the late Mr. Weed and his innumerable kinsmanship, he might only use barnyard-litter for winter protection, and next spring, about Easter, the nice little weed seedlings contained in that litter will most certainly celebrate their resurrection, and compel the surprised husband to do the work of weeding over again.

REMARKS—Manures being of great importance, I will add a few remarks on this subject. The best kind is that which presents to the growing plant all the principles of its composition, and, at the same time, the best method of manuring is that which restores to the soil all substances removed from it by the crops. There is much difference between the plants; the vine, for instance, contains much potash, the wheat much phosphate, and grass and clover contain much lime. For comparison, look at the following table which shows only the principal ingredients of the ashes of a few plants, in percentage:

1. BEANS.

Carbonic acid	1.0
Sulphuric acid	1.5
Phosphoric acid	34 2
Lime	5.1
Magnesia	8.6
Potassa	45.2

2. PEAS.

Carbonic acid	0.5
Sulphuric acid	4.7
Phosphoric acid	30 1
Lime	10.1
Magnesia	11.9
Potassa and Soda	37.8

3. POTATOES.

Carbonic acid	13.4
Sulphuric acid	7.1
Phosphoric acid	11.3
Lime	1.8
Magnesia	4.4
Potassa	51.5
Silica	5.6

4. TURNIPS.

Carbonic acid	14.0
Sulphuric acid	10.9
Phosphoric acid	6.1
Lime	10.9
Magnesia	4.3
Potassa and Soda	37.8
Silica	6.4

5. BEETS.

Carbonic acid	16.1
Sulphuric acid	1.6
Phosphoric acid	6.0
Lime	7.0
Magnesia	4.6
Potassa and Soda	45.0
Silica	8.0

6. WHEAT.

Carbonic acid	0 5
Sulphuric acid	1.0
Phosphoric acid	47.0
Lime	2.9
Magnesia	15.9
Potassa	29.5
Silica	1.3

7. OATS.

Carbonic acid	1.7
Sulphuric acid	1.0
Phosphoric acid	14.9
Lime	3.7
Magnesia	7.7
Potassa	12.9
Silica	53.3

8. CLOVER.

Carbonic acid	25.0
Sulphuric acid	2.5
Phosphoric acid	6.3
Lime	24.6
Magnesia	6.3
Potassa	26.6
Silica	5.3

9. WILD PEAS.

Carbonic acid	0.6
Sulphuric acid	2.6
Phosphoric acid	38.3
Lime	3.0
Magnesia	7.8
Potassa and Soda	39.6

Now, the atmosphere furnishes the organic elements to the plants, whilst the earth and manures are to furnish them with earthy and alkaline salts, etc. Every plant needs nitrate of ammonia which, it is true, enters directly in and by means of rain water, but not in sufficient quantities, and therefore any manure which contains most *nitrogen*, is most desirable, of course, in its state of *decomposition*.

Dry barnyard manure contains for instance, carbonic acid 35.8, hydrogen 4.2, oxygen 25.8, nitrogen 2.0, and salts and earth 30.2 in 100 0, but its nitrogenity may be enhanced by making it liquid with urinous substances. By-the by, this liquid manure should never be applied in the hot sun.

The following list gives the percentage of nitrogen in fifty different kinds of manure, but all of them in a state of dryness, viz:

Man's urine	23.1
Woolen rags	20 3
Salt fish	18.7
Feathers	17 6
Horn clippings	15 8
Cow hair	15.4
Blood	15.4
Flesh	14.2
Maybugs	13.9
Cracklings (dregs of rough suet)	12.9
Horse urine	12.5
Colombine (pigeon manure)	9.0
English black (blood, lime and soot)	8.0
Bones	7.6
Guano	7.0
Linseed cake	6.0
Residue of common glue	5.6
Walnut cake	5.6
Barley or malt waste	4.9
Hempseed cake	4 8
Cotton cake	4.5
Lupine seed	4.4
Belloni Poudrette	4.4
Beet leaves (panes)	4.4
Mixed goat manure	3.9
Cow urine	3.8
Mixed hog manure	3.4
Grape cake	3.3
Mixed horse manure	3.0
Mixed sheep manure	3.0
Carrot leaves	2.9
Box (rotted branches and leaves)	2.9
Montfaucon poudrette(man's excrements)	2.9
Beechnut cake	2.5
Potato leaves	2.3
Sea-weeds	2.3
Cow dung	2.3
Solid horse dung	2.2
Animal black from sugar refineries	2.0
Pea straw	2.0
Potato pulp	1.9
Heath leaves	1.9
Beech leaves	1.9
Clover roots	1.8
Pear leaves	1.6
Oak leaves	1.6
Acacia leaves	1.5
Coal soot	1.5
Wood soot	1.3
Poplar leaves	1.2

Soil is man's foundation, the condition precedent to his existence. It appears rather strange that the farmer of our enlightened

age really knows so little of this, his only foothold in God's wide world. As to the past, that strange appearance in the history of the agricultural nations may be partially explained, however, by the fact that ere this only ignorant men beloved the soil. But at the present time, after we have cast slavery and bondage behind us, boorish ignorance has disappeared from the homes of the farming peasantry, I should think. Or has it not?

Would every American acknowledge it as a matter of historical fact that France and especially Germany took the lead and are still keeping the front rank in scientific farming. Great Britain and Ireland, those so called free countries, whose peasantry are shackled with the heavy irons of half-bondage, are unfit for taking the same lofty standpoint, but America, the land of the free and free homesteads, where slavery most fortunately belongs to the past, is bound not to remain behind in the race of agricultural progress.

Only he who knows his soil thoroughly can judge of and decide the question of what kind of manure is to be applied.

Prior to 1789, the analysis of soil, which is a, nay, *the*, precedent to such knowledge was still quite embryonic. In that revolutionary year Christoph Albrecht Rueckert, the royal Bavarian apothecary, of Ingelfingen, broke the ice. Schuebler's and Dr. Sprengel's classic words followed up his course, until, through the instrumentality of Thaer, of Mœglin, the great Prussian reformer of agriculture, a new era dawned upon the unexplored soil of Germany, where he succeeded in having the Royal Government order to partially analyse it on a large scale. This occurred in 1845, after, five years ago, Baren Von Liebig, the great Bavarian chemist, had inaugurated the most recent epoch of agricultural chemistry. Stœckhardt, of Tharandt, Saxony, Schwartz, Boussingault, (1856,) the circumspect French chemist, and others followed in his footprints.

D. Planting.

Strawberries are planted either in the months of March, April and May, or in the months of August, September and October. Plants set in spring will bear fruit the next year without injury to them, but plants set in fall will bear partially the next season with injury to them, This being a fact, *early* fall planting can only be

recommended, if the blossoms in spring be pinched off, thus not allowing them to bear fruit, which, I judge, is absolutely necessary; spring planting is preferable by any means.

As I mentioned in the preceeding chapter, the soil must be plowed and cross-plowed to a sufficient depth, mixed with manures and pulverized through harrowing. After this it can be planted according to three principal systems, viz: in hills, rows and beds.

I. Hill System.

Cross-furrow out the soil both ways, as for corn, at distances of two and one and one-half feet respectively, and beplant the corners, after the lines have been marked off with a cord of Russian hemp. Cut off all runners during the growing season. All kinds of grandifloras can only be grown in hills, and this system is also generally preferable on account of less labor and more crop. An acre would contain 7,260 hills, and may yield about 200 bushels of fruit p. a. Since old plants don't produce large berries, and the first season's manure stimulation only lasts three to four years; after this period has elapsed, the vines should be plowed under. If a grower should want to pass over to the row system, he may allow the runners between plants to grow in the second season, and thus the row system is initiated.

II. Row System.

The distance may be taken between rows at $2\frac{1}{2}$—3, and between plants at 1—$1\frac{1}{2}$ feet distances.

III. Bed System.

Each bed of four square feet is to contain two rows of two feet apart, and the distance between plants one foot. After two crops the interval between two beds can be plowed up and prepared for new beds, in which runners from the old beds are to take root, and so on vice versa, until, after three to four years, the soil will prove entirely exhausted.

The *planting manipulation* is very easy, but care must be taken that the fine fibrous roots be not destroyed, and all superfluous leaves and runners cut off. It is well done, besides, to saturate the roots thoroughly with a liquid made of cow manure and spring or fountain water, before planting the best time of which is during cloudy, or even rainy weather. If the soil, however, be excessively

dry, it must be watered, every wetting process being performed either early in the morning, or after sunset, and never in the hot sun. Spring water is better than river water. In planting the roots are spread out, and slightly covered up with pulverized soil. Small holes made with a dibble are not good; the garden trowel is a good instrument to work with, and, besides, I should think that both the cultivator and two-pronged hoe afterwards, are better than the watering-pot, for in abundance of natural moisture, worked through frequently stirring up the soil around, is far superior to that kind of, so to say, artificial moisture, or rather wetness, which is worked through watering. Sometimes plants have been puddled, particularly such as are designated for long journeys by nurserymen, who mixed water and soil to a thin mortar and coated them with it. In such a case, the coat should be washed off, and the plants refreshed before setting.

As to how many times the same stools are allowed to bear fruit, there are two systems in vogue, viz: the annual and biennial.

A. Annual System.

Set the plants one by three feet, and allow them to bear one season, after which you have to plow them under and beplant new beds.

B. Biennial System.

The plants are put in beds of two or three rows each, 18 by 18, and all their runners allowed to grow; between beds there should always be a path of one-half foot wide for the weeder. After two crops the stools are plowed under, and something is sown for one or two seasons. This is perhaps the best system for field culture.

A man who wishes to grow a few strawberries in his *garden* for *family use* only, should always select the best varieties, such as the Jucunda, Agriculturists, Wilson's Albany, (contains more tartaric acid than others, and therefore requires a little more sugar,) Stirling, Bartlett, (a compact and hardy grower, abundant in late crops,) and Triomphe de Gand, the fruit of which is most dellcious, rich and luscious, and crisp with seeds all over, as well as amazingly abundant in runners to be clipped off weekly. Keen's Seedling and the British Queen are famous English varieties, the former of which may be recommended like the Monthly Alpine, whose berries last from May until winter. It has been observed in the first place,

that the crop from seedlings is larger than that from runners; in the second place, that light soil produces early berries and heavy soil produces late ones, and finally in the third place, that liquid manure is perhaps the best stimulant in garden culture.

In conclusion, I am going to enjoin a few rules for the hot-house culture. Hot-house strawberries always lose of their flavor by forcing. The Bartlett is the best variety in this respect. Set it in rich soil, consisting of three-fourths of old sods or turfy loam, and one-fourth of cow manure, thoroughly decomposed, mixed together and pulverized, in small pots with a hole in the bottom, and keep the top of its stool at two or three feet distant from the glass, by a temperature of 65—75° during the day, and 50—60° at night. Sprinkle it now and then, and don't forget that it wants air during the blooming season.

But finally, I suppose that farmers will not often take to this kind of fancy culture.

E. Training and Pruning.

The culture of the dwarfy strawberry vine, the greatest height of which is only about six inches, like the comparatively gigantic grape vine, involves training and pruning, although not to such an extent.

Commencing with the close of the growing season, the stools should be covered for winter protection, especially in locations where little snow and sudden changes of freezing and thawing are to be supposed, to a thickness of 1—2 inches, with spent hops from the brewery, (excellent against insects,) salt meadow or bog hay, pine leaves, clean straw, planing mill shavings, or, the best of all, fine cornstalks, but never with stable litter, sawdust or tan bark. Mulching by adverse plowing is only advisable where the soil is very light. At the same time, the dead leaves of the vine ought to be removed, but pruning not to be undertaken. Spade some manure in, if you want to.

In spring, remove the winter covering from the top, whilst, to keep the berries clean and the soil moist, it will work well, however, to leave part of it one foot around the stools. Remove also the dead leaves from the vines, and leave only two or three thriving leaves at the center. If late crops be wanted, the first blossoms must be rubbed off, a manipulation which protects the plants from

late spring frosts, besides, and in any case large and best qualified berries should be desirable, as I suppose, thinning or cutting out is indispensible.

In summer, the principal occupation of the strawberry-grower needs must be to make constant warfare upon a thousand hosts of the different obnoxious weeds, the extirpation of which *can* be attained through perseverance in using the horseweeder, cultivator, rake and hoe, if the weeds be not allowed to mature a new crop of seeds. . This assidous weeding, raking and hoeing will also be of good service in keeping the soil pulverized and moist without using the watering pot; but it is to be done with some care after the runners between rows, beds, hills and plants have made their appearance, that is to say, if they should be wanted for the sake of propagation. Liberal summer mulching is advisable.

Finally, it is a conclusive rule not to work heavy clay when wet, and, the watering pot once used, to follow up this method of moistening the soil, or else it will prove of no avail at all.

F. Diseases and Insects.

Strawberries are not subject to particular chronic diseases, but on sudden changes of temperature, and in warm and wet weather, sometimes mildew and a kind of fungus called strawberry brand, the latter, however, late in the season, and therefore of but little injury, will appear.

The following insects are injurious, viz:

1. The *Larvæ* of the *White Grub* or *May Beetle.* This obnoxious insect hails from old dry pastures and meadows, and therefore none of their sods should be taken into gardens and berry fields, nor should old pastures ever be taken under berry-culture. The larvæs are one and one-half inches long, three-eighth inches thick, white and white headed. They attack the roots, and are able to destroy all of them. The beetle is chestnut colored, dotted or punctured as if needled, and its breast is covered with a yellowish dawn. The crow, its principal enemy, eats a hundred a day, and one hundred rose bugs for breakfast, besides.

2. The *Wire Worm* or *Julus*, a many-footed worm, is not very destructive. Stirring destroys it.

3. The *Rose-slug*, a small greenish worm, with a brown head, one-half inch long, and one-sixteenth inch in diameter, stays only six weeks, and is scarce on strawberry vines.

4. The *Red Spider* is destroyed by sulphurizing.

5. The *Plant Louse, Aphias* or *Green Fly* would suck the juice out of the roots. Dry ashes, or refuse from a tobacco factory will kill it.

6. The *Snail.* Lime would destroy it.

Thus we see that besides crushing and picking off, lime, sulphur and the refuse of tobacco factories are instrumental in checking the diseases of the strawberries; but as far as the injurious insects are concerned, *birds* are the best physicians, and no sensible man should, I speak generally, allow them to be disturbed, killed, or kept off by hunting boobies, or naughty boys, particularly in this country where they are scarce enough anyhow. In speaking of birds, I especially intend to refer to our *small-flying birds.*

Every husband, I don't care whether large or small his real estate may be, is bound by his own interest, to take the care of making those friendly birds feel at home by setting out boxes, calabashes, squashes, and other rough contrivances for birds' nests, about his farm and fields. Such an open aviary would pay well. Wrens and blue birds take to them as robins do to the eaves of woodsheds, swallows to the barn, sparrows to the barn yards, and orioles to thickets. Birds are, through their eating millions of insects and worms on which they mostly live, the best friends of all those who plant and sow, and want to reap, and levy only a very small tax on the different crops. Two small birds, for instance, eat 1,000 worms in eight hours, and a swallow devours 550 insects a day. And what about the crow? This bird seemingly so useless is one of the most valuable insect destroyers.

It is pretty generally known that France suffered a great deal and is suffering yet from the devastation of her forests, an event which, by-the-by, in any country produces unfertile soil and severer climate, and seems to be allotted to America too, because of the absence of any sense in our forest destroying backwoodsmen. Now, that unlucky European country always vacillating between kingdom, empire, republic and anarchy, owes this foolish devastation not only to all-destroying anarchists, who misruled the land towards the close of the past century, but also, and probably much more, to her foolish boys who every year would destroy, or take out 80—100 million birds' eggs. Our legislatures should protect both birds and forests.

G. When are Strawberries Ripe?

June is the principal month of the strawberry season, although already about the middle of May ripe strawberries, especially from Virginia, where they ripen two weeks earlier, appear in the Broadway saloons of New York, and, on the other hand, some kinds coninue during the dog-days. Of course, I don't mean to speak of hothouse fruit.

Ripeness naturally depends upon latitude, location, soil, care, training and varieties, but there are some early kinds, such as the Boston Pine or Bartlett, Jenny Lind, and Downer's Prolific, and odd late ones, viz: Wilson's Albany, Russell's Prolific, the Jucunda and Triomph de Gand.

As I mentioned before, rubbing off the first spring blossoms will most certainly procure late crops, as careful working and weeding will mature the berries of every variety.

H. Propagation.

Strawberries propagate through runners, root-divisions and seeds.

1. Take *runners* from sound plants grown in loose open soil, cover them up in dry weather, start them in spring, and apply pure manure composed at the time of planting.

2. *Root divisions.* Of varieties which grow only a few runners the roots may be divided and used as plants. This would be done in early spring. The lowest end of the old root, if it be long, is to be cut off, and such plants to which afterwards only one crown is left, are set as deep as possible.

3. Take *seed* from fully ripened berries early in the morning, and spread it out to dry. When washed out in water, good seeds will sink, and the pulp remain on top. Keep the seeds until next spring, or sow them. A second method is this. Mix the largest berries with dry sand, crush the fruit, and no two seeds will stick together. Then sow the seed and sand into a light, mellow and well shaded soil, pots or boxes, cover the whole one-fourth inch deep, and keep it moist. Four or six weeks after sowing, transplant these settings on a wet or damp day, when they have four or five leaves, two by two feet, let the soil adhere to them, soak it before planting, and do afterwards away with the runners.

Strawberries, like grapes, can also be propagated by way of *hybridizing, i. e.,* the impregnation of the stamens of, for instance, the Virginian tribe with the pollens of one of the grandifloras, and vice versa.

It is easy to raise new varieties—their number is a legion; but better ones are very difficult to grow, and disappointment is predominant The safest way of propagation, be it said in conclusion, is that from runners.

II. The Raspberry.

Raspberries are either foreign or native, aborigines or immigrants. The Purple Flowering R. is found wild in high rocky places at the North, the White Flowering R. in Michigan and westward, and the Wild Red R. is common all over the land. But the cloudberry, which is grown at present on and between the high mountains of Maine and New Hampshire, and in both Canadas, is a European, and so is the European R., our most common garden raspberry, and chief foreign kind, which, by the name of the Rubus Idaeus, (Mount Ida, near Troy, Asia Minor,) was known to the old Greeks, and cultivated by the Romans, 1,400 years ago. The elder Pliny did not know yet of cultivated raspberries; our ancestors took them from the woods and waysides, and it is only since the XVIII century that this tribe of savage berries was taken under culture. Since 1830 the Red Antwerp, a very good market variety, is extensively grown in America, but still in 1850 only foreign varieties ruled the market.

The raspberry season lasts about six weeks, and follows the strawberry season. I don't think much of the overbearing varieties, which mature two crops in a season. Davison's Thornless, Doolittle's Black Cap and the Purple Cane are early kinds; the American black is the latest variety.

Raspberries require some richness, deep plowing and moisture of the soil, as well as elbow-room for the roots to run down. There is, however, nothing particular about the preparation of the soil but what has already been said on strawberries. The common red and white kinds, (Antwerps and Wild Reds,) thrive well in heavy clay

and loam. The Blacks prefer light, sandy soil, but grow in heavy, compact grounds too. North of 41° latitude, winter protection is advisable. The shade of trees is not injurious.

The amount of labor is about that required by corn, but the net profits amount to $150 to $200 per acre, nay, statistical annotations prove that one acre in Marlborough township, Ulster county, N. Y., a berry region which sends $100,000 worth of raspberries to New York, cleared $400 in a season.

A. VARIETIES.

I. Natives.

1. The *American Black* grows all over the land. Fruit middle-sized, black, sweetly flavored, but little juice, abundance of seeds. It is the latest variety, and excellent for cooking.

2. The *Black Cap* was found wild about 1840, by Leander Joslyn, of Phelps, Ontario county, N. Y., and is very thorny and vigorous. Fruit large, black, sweet, flavored and juicy. This very productive variety is extensively marketable. Nrs 3—5 are improved varieties of the same stamp.

3. The *Miami Black Cap* hails from the Miami Valley, Ohio, bears large, dark brown berries, and not so many thorns as the Black Cap. Very hardy, productive and valuable. Late kind.

4. *Doolittle's Black Cap* has double the size of the common Black Cap, and was introduced by H. H. Doolittle, of Oaks Corners, N. Y., in 1867. Fruit dark red, very hardy and productive. Propagated by laying its tips. Much esteemed for cooking and preserving.

5. *Davidson's Thornless*, introduced by Joseph Sinton, of Angola, Erie county, N. Y., is ten days earlier than the common Black Cap, and the only thornless variety in vogue. Berries like those of the Black Cap. Canes strong, stalky and smooth, with only a few spines near the base. Very good and productive. Resembles the Doolittle.

II. Purple Canes.

This kind is also a native one, and belongs to the Black Cap kindred, of which it differs in its fruit, it being not dry, tough and peculiarly flavored, but soft, juicy and mildly flavored.

1. The *Purple Cane* is an enormous yielder everywhere, produces no suckers, and is propagated from the tips of the young canes. One of the earliest kinds. Berry rather small, dark red, soft and sweet, very good for family use and market. Canes very strong and almost without thorns.

2. The *Philadelphia*, is a very hardy and productive variety was found in or near Philadelphia, Pa., about 1835, and in the past twelve or thirteen years wildly cultivated, particularly in sandy New Jersey. Propagates from suckers. A very good market variety. Berry large, roundish, purpleish red, very juicy. Canes erect, strong, purple colored, almost spineless. Leaves large, dark, green above, and lighter beneath, very thin and tough. No winter protection. It is a regular bearer, and bears up its berries very well. Being one of the earliest pioneers, it took the lead of native raspberry culture.

III. Wild Reds.

This kind is not generally called a native one, probably because so many foreign varieties were crossed with it.

1. The *Kirtland*, one of the best native varieties, early and almost without spines, quite productive and hardy, was originated with I. P. Kirtland, of Cleveland, O., many years ago. Berries middle-sized, roundish, light crimson, and flavored. Canes erect and pale red when the wood is ripe.

IV. Foreigners.

1. The *Red Antwerp*, brought from England to this country by Mr. Briggs, of Poughkeepsie, N. Y., in 1830, is the most valuable market variety of New York State. Berry red, large, conical, firm, sprightly flavored. Canes short, stocky, with few spines, grayish when ripe. Winter protection. Not often genuine; already in 1857 considerable confusion was prevalent. Yielded some time ago $500 per acre on the Hudson river.

2. The *Belle de Fontenary*, or *Victoria*, originated in France, is the best of the autumn-bearers. Berries very large, long conical, dark crimson, acid and good. Canes very strong, with purple spines. Leaves thick, dark green above and silvery white beneath. A very hardy and productive bearer; a second crop in fall. Most of its great number of suckers should be removed as soon as they appear.

3. The *Clarke*, a valuable seedling raised by E. E. Clarke, at New Haven, Conn., in 1856, is said to be perfectly hardy and very productive, and to withstand as well cold winters as hot summers. Berries large, conical, light crimson, sweet, rich and high flavored; they don't drop when ripe. Canes very strong and erect, with white spines. Leaves like the Victoria's and very thick; retained until killed by frost.

4. The *Franconia* was introduced from France, in 1840, and is a very good market variety, but requires protection in winter. Berries very large, conical, purplish red, richly flavored. Canes strong, with stout, purplish spines and large, deep green leaves.

5. *Brinckle's Orange*, originated with the late Dr. D. W. Brinckle, of Philadelphia, Pa., before 1857, is one of the best varieties under culture, but, strange to say, not very marketable, although it is very hardy. Berries large, conical, orange-colored, sweet and deliciously flavored. The canes bear small white spines. Winter protection is required. Most recommendable for family use and the market.

6. The *Hornet*, the largest of all raspberries, was originated near Paris, France, is a strong grower and very abundant bearer, and brings perhaps the highest price in the market. Berries large, conical, deep crimson, juicy and moderately firm. Canes very strong, erect, with long fruit stems and short, purplish spines.

B. Planting and Training.

Suckers and roots are the best plants, particularly such as have a good many small fibrous rootlets.

The most recommendable planting time is spring at the North, and fall at the South where frost would not enter deeply.

Raspberries are planted in rows, or hills, the stools generally four feet apart, with four to six feet distance between rows in which intervals potatoes, or strawberries, the latter fed with well-rotted wood moulds, may be raised. If two or (in gardens) four plants be planted in a hill, for fear that one or more plants may die, six feet distance between rows is required, at least. A little bone-dust, or poudrette will promote the growth of the plants whose upper layer of roots should never be placed deeper than four inches below the surface. At the time of planting, every plant ought to be cut down close to the ground.

During the growing season the plants should never be banked up, and the ground as well between rows and hills as between plants always kept level and clear of weeds. Allowing no more than six to seven suckers from one stool will prove instrumental in getting abundant and qualified crops.

Mulch the ground the first season, and coat every spring with well rotted manure. Sacrificing the summer crop means securing a fall crop.

The raspberry is biennial. It canes one year, and fruits the next. But its roots are perennial. After the growing season is over, the old fruiters are cut down, and the young growers, wherever it is required, protected by laying them down lengthwise of the row and putting a shovel-full of soil upon them when their wood is ripe. Next spring they are taken up again with a fork and trimmed.

Stakes are not necessary at all, particularly not in case a grower steadily takes to the better method of training. No one should allow his raspberries to grow higher than three feet, and they will be self supporting against wind and rain. But if some one should choose, he may use stakes of five feet long and take to hedging in which case the canes a distance of two feet are allowed, or to hoop training (place two stakes each one foot from the stool, and fasten a hoop around their tops), or any kind of wire-trellising, put, for instance, stakes at two feet distance from every stool and bend the canes over.

Such raspberry plantations can last from twelve to fifteen years. When broken up other crops may be raised on the same ground.

C. Diseases.

The raspberry is not much liable to sickly effects. Underdraining will prevent the rust, which, roosting particularly on old and feeble plants, be they cultivated or wild, otherwise would cause decay in winter.

Very few insects attack the raspberry tribe, and amongst them the most injurious the Black Bush Borer, is not very common. Its parent is one half foot long, black, with a rusty-yellow breast; she lays her eggs early in August, at the base of the leaves. The thus besettled canes, bereft of their sap, will wither, and should always be cut off and buried.

D. Propagation.

The raspberry propagates from roots, suckers, layers and seedlings. Its enormous vitality ranks next to that of the blackberry.

1. Treat raspberry *seeds* like strawberry seeds, as far as propagation is concerned.

2. *Layers.* Single bud cuttings from two to three inches long are perhaps better than suckers, and may be mulched with dry and porous soil, or kept in a cool dry place. Boxes with small holes in the bottom, buried on a dry knoll, and covered with one or two inches of soil, are good layer preserves.

3. *Suckers.* Bend down the suckers, and cover their tips with soil one foot deep. Cut them off for planting, from August until the middle of September. In two or three weeks they will root. During the winter these plants must be heeled in.

4. *Roots.* In fall dig down around the stools at a distance of one foot, and thus sever from it the roots in the ground, which will throw up suckers the next spring. These are excellent plants. Those roots may be divided again by spading down a second time, so that one foot be their length. The old stool should be entirely removed, and its place leveled.

III. The Blackberry.

The blackberry, a relative to the raspberry tribe, in the diseases and parasital insects of which it also participates, is in the berriless season when raspberries are gone, a real delicacy and on account of its intensive vitality, the hardest thing to kill, and the easiest small fruit to cultivate.

About 150 species are known, but America is the only country in which the blackberry is under culture; therefore foreign varieties generally are inferior to our native ones which yield enormous and beautiful crops all over the land from Maine to the Gulf of Mexico and the mouth of the Columbia River.

The cut-leaved was the first variety taken into cultivation, about 1830, but at the present time it is scarcely worth growing. As the principal pioneer the New Rochelle or Lawton, found wild in 1834, is to be mentioned.

The blackberry is one of the healthiest fruits, and although it be inferior in price to the raspberry, and its gathering obstructed by a multitude of strong spines, the profits derived from it are not less than those from raspberry plantations, because its enormous crops bring up the rear.

Generally treated like the related raspberry, the blackberry requires deeply spaded, rich and rather dry, sunny borders, and is very fond, for instance, of suds from the family wash; for full maturity the berries want all the sun. It is true, this tribe requires rather dry soil, but to presume that it wants less manure than its kinsman, is a mistake altogether, and may it be reminded at once that no cultivated plant, whatever be its name, or nature, is fond of weeds. Weeding stirs the soil, and this stirring is, at the same time, beneficial to the whole berry family, if it be done with care, so as not to injure the roots of the main stalk.

As to gathering, I would enjoin the observation that blackberries, like raspberries, should never be picked before the morning dew is off; picked with dew on, they would not keep well. Immediately after strawberries and raspberries they are ripe, and continue the berry season. In productiveness they outshine every other berry, the historical fact being before us that a single stool has borne 1,800 ripe berries, and an acre of New Jersey soil once yielded 2,000 quarts in a season

It would not do to have the canes and shoots grow their own way; they reach a height of from twenty to twenty-four feet. Plant in rows, at eight feet distance between the rows and plants. Allow only three vigorous canes in a cluster or hill. Don't plow between rows after the second year, when you may plant potatoes and strawberries in the spaces; stop all suckers between rows. As soon as the canes are two feet high, nip all the tips, so that the stalks in July be not over three or four feet, and the laterals about one foot long. After picking, which begins about July 20, and continues, with the late varieties, until September, the fruiting canes should be cut down to the ground, and all superfluous foliage removed from the growers, which will be fruiting canes the next season. Where winter protection is necessary, the fruiters are to be laid down in fall, and covered up with one foot of, or more, dirt.

In conclusion, I would say, that at a height of three feet, no staking is required, because the canes or stalks are stocky enough to support themselves against the fall and winter winds.

Varieties.

1. The *Dorchester*, a very early and abundant bearer, was introduced by Josiah Lovett, of Beverly, Mass., in 1850, after he had tried it eight years, and has since proved to be an excellent market variety. Fruit large, oval, sweet, and deep black. Canes vigorous and quite hardy. As soon as they are ripe they turn black. Ripe early in August.

2. The *Kittatinny*, at present the best variety for general cultivation, was found wild by Mr. Wolverton, in the Kittatinny mountains, of New Jersey, about 1845. It is earlier than the Lawton, immediately follows the Wilson, and continues four to five weeks. A strong and robust bearer, and as hardy as productive, Berries deep shining black, when ripe, large, conical, sweet, rich, and of excellent flavor. It is only since 1865 that this berry is more extensively cultivated. Winter protection seldom required.

3. The *New Rochelle* or *Lawton*, the most renowned amongst the blackberries, was found by Lewis A. Seacor, of New Rochelle, N. Y., in 1834, as a savage of the fields. Fruit very large, oval, jet black, very juicy, and pretty sweet, very soft and excellently flavored, when fully ripe. No sooner than a few days after the berries have become black, they are perfectly ripe. It is a late variety and keeper, a strong and vigorous grower, and very productive, but it is required to keep its borders moist and mulched, or else the latest berries will remain unripe. Picking lasts from six to eight weeks, all through August. Its canes are tender and need winter protection. At one time, eight bushels of fruit have been gathered from forty stools.

4. *Wilson's Early*, discovered by John Wilson, of Burlington, N. J., in 1854, is perhaps the best early variety, the crop of which only lasts two weeks. Fruit very large, oval, black, quite firm, sweet and rich. Canes strong, roundish, and sometimes creeping. This variety was formerly called the *Dewberry*.

5. *Newman's Thornless*, introduced by Jonas Newman, of Ulster County, N. Y., is highly appreciated, because of its being almost without spines, and dwarfy, since it grows no higher but three to four feet. Not very productive. Fruit middle-sized, black, a little acid. Canes round, slender, with small spines, or quite smooth. Early in August.

6. The *Crystal White*, a very peculiar new variety from the West, introduced about 1865, bears yellowish-white fruit of excellent quality, and very narrow leaflets, which are almost oblong.

IV. The Currant.

The currant, a delicious and very salubrious fruit, on low shrubs, the jellies of which may be condensed, and, being the best refreshment on ship-board, transported all over the world, grows wild in all the United States, and both Canadas, as well in cold, damp woods and swamps, as on highlands, but almost all our best cultivated varieties are derived from the red and black currants, natives of Northern Europe and Siberia, which were taken into cultivation in France, towards the end of the XVI century, and thought to be gooseberries. Our natives are too acid; it seems, however, that the Mormons lately succeeded in cultivating some of them.

The currant is, as I mentioned above, a very wholesome fruit. Currant wine is not uncommon in England, and was already in 1771 recommended by the Philanthropic Society, of Philadelphia, to the Americans who, particularly as far as the Dutch Pennsylvanians are concerned, were not deaf to their admonition; it has nearly the taste of Madeira.

The dried young leaves of the currant shrub in Siberia, and some European localities, successfully take the place of tea.

For jellies, red currants are commonly taken, but white currants are richer flavored, and less acid, and the black varieties are even the least acid, but rather musky.

A. Varieties.

Every good patriot should be proud of promoting the culture of our natives, which, notwithstanding their acidity, promise to become, by careful cultivation, as valuable as the foreign varieties.

1. Natives.

1. *Sweet-fruited Missouri*, a black variety, the good qualities of which the Mormons of the Salt Lake region, boast a great deal of. Its berries are large, roundish, black, and its small bunches contain few berries. Sweet musky flavor.

2. The *Deseret*, a native of the North-west, a strong and rapid grower, and very productive, was introduced by a Mormon, of Salt Lake City, Utah, about 1860. Fruit very large, round, dark violet, and agreeably flavored. It is the most promising native.

3. The *American Black*, seems to be worthy of cultivation, as it naturally has a better flavor than its European name-sake. Fruit not large, roundish, black, and in small clusters.

2. Foreign Varieties.

1. The *Red Dutch*, perhaps the best of our currants, most certainly superior to the Cherry and Versailles, is a vigorous grower and very productive. Berries large, deep red, rich and juicy, on long bunches.

2. The *Cherry*, the largest red currant in cultivation, pays well in market. Berries very large, dark red, acid, and not rich. Leaves large, deep green, thick and tough. Bunches short. A very strong, stocky and productive grower.

3. The *Versailles*, the best table currant, is not so acid as the Cherry, its nearest relative, and in this country of more recent date. Berries very large, dark red, and a little acid, on large bunches, up to two and one-half inches in circumference. Hails from France.

4. The *Victoria*, a most excellent variety for home use, is very productive and also known by the name of the *Houghton*. Berries, very large, bright red, sprightly acid, and well flavored, on very long bunches, on which they hang long. Young branches, tender, although vigorous and productive. Late in September.

5. The *White Grape*, the finest white currant grown, is very productive. Berries large, yellowish-white, transparent, juicy, sweet and rich, in middle-sized bunches. Foliage dark green.

6. The *Black Naples* is a very good grower, and productive after odd years. Berries very large, black, sweet, but of a rank and musky scent. The largest in cultivation.

B. Soil, Training and Pruning.

The currant will grow in almost any soil, but naturally prefers deep, rich soil, and likes heavy loam better than light sand. It pays, at the same time, well for the labor and care it requires, by being very productive, and always contains a full crop every year. 6,000 pounds have been harvested from an acre, and a net profit of $300 made.

For field culture, the stool form, and for garden culture, the tree form is advisable. Manure of any kind will do; weeding is not to be dispensed with; mulching promotes the quantity and quality of crops, and the rows should be taken at about five feet distance, one from another, whilst the space between stools or plants ought to be four feet.

1. In *stools*, allow suckers to spring up from single plants, and establish symmetry by shortening, or partially removing, the suckers; cut out all the old and diseased wood and crowding suckers. Six shoots in a stool are enough, the tips of which being pinched off, they will become more stocky, self-supporting and fruit-producing. Every fruiting cane should be removed after two or three crops. All the red and white vines are commonly trained in stools, as well in fields as in gardens, without ever being attacked by the currant borer.

2. In *trees*, train only one shoot or cane erect, and cut it back at the commencement of the second season to twelve to eighteen inches from the ground; now allowing three to six inch shoots symmetrically growing around the stem, which are to be shortened to the same length in the third season, whilst the head of the bush remains open; allow six to twelve shoots to grow in the third season. Pinching, pruning, cutting out, &c., is the same as with the stools. Such plantations may last eight to ten years. All the blacks with their strong growth and and large coarse stems, which don't dislike lesser pruning, and produce larger fruit on old stems than on young ones, particularly so if all weak shoots be cut out, are exceedingly fit for this method of training.

Besides, currants like the sun, and have no objection to being planted near sheltering fences and walls; but what they are always thankful for, is mulching between rows and stools, or trees.

C. Diseases.

Many diseases were imported with the plants from Europe. In general, these and the native diseases are the same as those of the plum and gooseberry, and they are originated by insects.

1. The *Currant Worm*, whose parent is called the Magpie Moth, in England, was imported prior to 1840. This moth lays her eggs in June, is nankeen yellow, and has brown bands on either wing. The worm, which as a pupa, winters in the earth beneath the plum trees, or currant and gooseberry shrubs, is one inch long and yel-

low, with small black dots. During the period of 1840 to 1860 it proved very destructive in the State of New York. Dust the shrubs with pulverized sulphur, or powdered white hellebore, or ashes.

2. The *American Currant Borer*, a white cylindrical worm with black jaws and a brown head, but without feet, changes at the end of May to a black beetle; previous to that time it resides, however, as a pupa in some stalk, cane or shoot, which was thereby diseased, of course.

3. The *European Currant Borer* is the infant of a wasp-like moth, with small glossy wings, the tips of which are yellowish, and a black abdomen, and very common in the East.

It is a general rule to cut out every stalk, cane, shoot, lateral, branch or limb of a shrub which was infected by such nefarious insects.

D. Propagation.

Nothing is easier than propagating currants. The following are the methods in vogue:

1. *Seedlings.* The practice is the same as with strawberry seeds. They germinate at a very low temperature, and require a good deal of moisture. When one year old they may be transplanted two feet apart in rows. Not in use but for getting new varieties.

2. *Green Cuttings*, two or three inches long, and cut off close to the stem, are reared under glass, or sometimes in the open ground when there is a little shade.

3. *Ripe Cuttings*, six inches long, cut from ripe wood at the base of a bud, are laid early in fall, and covered with mulch for winter protection, or bundled up and kept in a cellar until next spring, when they are planted as early as possible. They are treated like other cuttings.

4. *Single Buds*, the wood of which one-half inch long, are planted, with their buds up, either in pots or in boxes, or in the open ground, covered with sawdust or tan-bark, When raised in hot houses, a temperature of 50° is required for the first few weeks, and 75° to 80° afterwards. When well rooted, they are transplanted into garden soil, together with the ball of earth clinging to their roots.

5. *Suckers.* Cut off close to their base, as usual, but not common.

6. *Layers* are bent down and covered with soil in the spring. In fall they have taken roots and are heeled in for the winter.

REMARK.—No fruit retains its character longer when canned than the currant, and yet it is much neglected. Knox, in Pittsburgh, keeps the largest and best collection of varieties.

V. Gooseberry.

The gooseberry, which is in season immediately after the cherry, grows wild in every one of the United States, the Canadas, Newfoundland, Mexico, Peru, and all the South American countries sloping down the Andes.

Our native varieties are naturally superior to the grossularias of Northern Europe, which don't thrive well in our soil, but with us gooseberry culture is decidedly behind the time. England, ranking highest, and renowned for her excellent gooseberry wines, which, a hundred years ago, was already manufactured by the wife of the Vicar of Wakefield, knew of eight cultivated varieties in 1640, and speaks at the present time of at least three hundred kinds under culture. There Lancashire is the leading county. The English climate is more suitable than ours, but more attention should be paid to this branch of small fruit culture, notwithstanding since it is a fact that an acre of American soil yields from two to four hundred bushels, at $1.50, and a pretty good harvest too.

The greatest obstacle to cultivating foreign varieties is the enmity of the *mildew*, under which they suffer the more, the older they grow, and of which the natives are nearly exempt. There are several remedies, such as dusting with sulphur flour, after the setting of fruit, continued after its maturity, watering with strong soap-suds and potash water, or sprinkling salt upon spent hops and tan-bark mulch; but none is certain as to the result. Besides, the following insects are injurious to both the native and foreign varieties.

1. The *Currant Borer.*

2. The *Gooseberry Bark Louse*, smooth, brown, with yellow dots and a stripe of the same color. Close pruning and syringing with potash water are remedies.

3. The *Mealy Flata*, a small dark-blue, flour-winged fly, attacks the leaves and shoots late in the season, by sucking the juice out of them. Dust the shrubs with ashes or lime.

4. The *Gooseberry Midge*, a small bright-yellow maggot, destroys any berry in which it roosts; in July it becomes a two winged musquito-like fly, of beeswax color. Destroy every infected berry.

5. The *Gooseberry Moth*, a slender, greenish worm, one-half inch long, known since 1856, feeds upon the pulp of the berry, the skin of which it entirely empties. It generally appears when the berry is half grown. Sulphurizing is recommended.

The gooseberry requires a rich, deep, moist soil, an open, airy situation, particularly on the cool north side of hills, because it cannot withstand extreme heat. Mulching the spaces between rows and plants, if possible, with tan-bark and spent hops, and old, well rotted manure, exclusively. Summer mulching will prove preventive of mildew also, even with foreign varieties, in some degree.

Plant in spring, because the gooseberry ripens its wood late. Its propagation is similar to that of the currant, whose training and pruning is also that of the gooseberry. The single stem or tree system is the better one. Summer pruning should never be performed, and all pruning done between fall, when the wood is ripe, and spring, when the buds commence to swell.

The following native varieties can be recommended, viz:

1. *Houghton's Seedling*, originated with Abel Houghton, of Lynn, Mass., is a kind of "weeping" gooseberry plant, and very vigorous. Fruit not large, oval, red, pale red, sweet and very good. It leaves are of a deep shining green. Being very prolific and a rapid grower, its canes are literally covered with fruit, and it is the best variety for our climate.

2. The *Mountain Seedling*, cultivated by the Shakers, at Lebanon, Pa., is the largest native, and of very good quality. Berries large, oval, pale red, with tough and thick skin. Very productive.

3. The *Downing*, the second best native variety, is very productive and hardy. Berries large, oval, greenish white, and of excellent flavor. Leaves similar to the Houghtons

4. The *Cluster*, a strong, slender grower, is also very productive. Berries small, oval, sweet, juicy, and of a reddish purple color.

VI. The Cranberry.

The cranberry is a Northern plant, and a native of the septentrional regions of Europe and America, where it grows wild in the lowlands, and on sandy soils; to the latter class belongs the bush cranberry of the high mountains of Virginia and North Carolina, and the former the small cranberry of Northern Europe and the Northern States of America. Since centuries this fruit is produced in great abundance in Russia, Sweden and England. Captain Henry Hall, of Barnstable, Mass., was, perhaps, about 1812, the first American grower. Since 1835, cranberry culture has became more extensive in New England, and at the present time thousands of acres of hitherto unimproved lowlands at the North, are covered with this kind of berries.

Deep *lowlands* afford the best borders, because the roots of the cranberry like to be about three quarters of a year in contact with water, and wetness kills the cranberry-worms, one of which, a black headed fellow, one-half inch long, attacks the fruit, and the other, a red headed one of the same length, are injurious to the plants. As to propagation, which is commonly done in the season previous to planting, dig a ditch around the field for the upper draining of the surface water, line it with an embankment of four feet in height, burn the under wood on the ground, scatter the ashes about, make the field entirely level, and coat it with pure sand four to eight inches in thickness. If there be an abundance of peat or muck, a kind of manure almost as valuable as barnyard manure, part of it may be carted off. The above coating of *pure* sand will prevent not only the growing of weeds, but also the over luxuriance of the plants, as flooding the field for from eight to twenty-four hours does for the further ravages of pernicious worms.

The best planting time is spring and early summer. To have the whole surface covered with vines being the object, set the plants in rows from one to two feet apart, or, if they are small, still nearer together. Plants may be procured either from wild beds where to be taken in sods, or from nurseries.

During the growing season constant attention is required in removing all weeds and brushsprouts, and soaking the field in times

of drouth. In fall, when freezing sets in, it is to be flooded from one to two feet high, this water protecting the ground from freezing up, is drawn off in spring next, the later the better.

Cranberries are excellent self-propagators. They creep all over the ground, and if a man wants to promote their growth and taking root, he has only to throw a little earth upon them. Plants may be used whole or divided Even upright stems planted in spring are rooted next fall. Seedlings are desirable because of getting new varieties, we are desirably in want of, since all the cultivated kinds belong to the common American, whether their berries be purpleish, or greenish yellow, or white. For this purpose sow the seeds in drills free from weeds, mulch them with sand on low grounds, and with sawdust or tan-bark on dry soils, and transplant them when they are one or two years old.

Upland culture is less profitable, and yet a horticulturalist cleared, some years ago, an annual profit of $400 from an acre of high ground. Every moist, loomy or sandy soil may be selected, and worked like a vegetable garden, manured with mulch or peat, and mulched with sawdust where this material can be had. The distances between rows are taken at two feet, and between plants at one foot. Hoeing in the growing season should be done without any disturbance to the plants. The Bell Cranberry has been often recommended for upland culture.

VII. The Huckleberry.

There is an excellent fruit belonging to the Cranberry kindred which is yet being much neglected, and this without any reason, it being very productive, hardy and entirely thornless. It is the Huckleberry, a beautiful small fruit which is more firm than the Strawberry, Raspberry and Blackberry, and even better fit for transportation. Besides, there is no better summer refreshment than Huckleberries with cold, sweet milk, my favorite desert, which always reminds me of noble Virginia, on whose berry producing soil they are plentiful.

Huckleberries bloom in May and June, and can be picked from July to September. There are different varietios of this low land plant which grows wild in a plurality of the United States, viz:

1. The *Highbush Huckleberry*, black, on shrubs ten feet high, a low-lander, but sometimes also upon high soils, is the best variety, and is ripe in August and September.

2. The *Blue Huckleberry* grows on the low lands from the New England States to Virginia.

3. The *Blue Dwarf Huckleberry*, the earliest variety, boards on the dry sandy soils from Maryland northward.

In conclusion, I feel obliged to state that I owe many of the foregoing remarks to *The Small Fruit Culturist*, by Andrew S. Fuller, of Ridgewood, Bergen County, N. J. (New York, 1867, Orange Judd & Co.)

Conclusion.

At last, I feel rather obliged to apologize before concluding. The task which I undertook waxed in its going on, and so did this book. Planned for about fifty pages avoirdupois, there are most likely as many more as there are days between Easter and Pentecost. This was not my design, I confess, but it is a fact. Therefore the public are certainly entitled to an apology of the writer who had not foreseen the waxing dimensions of the subject. I now see it quite clear that an author cannot be at the same time, so to say, all-knowing and all-seeing, and since I am neither, thank God, and even nothing but a fallible human being, much unlike to the Pope, I feel stubbornly happy enough to suppose that I might deserve the pardon I beg in conclusion. Happy the man who believes in the lieutenantcy of supposition when the captaincy of fact is vacant.

But there is another serious incident or rather accident to meet with. Alas, it is this. The reader who was struck with the motto: "I mean business, not much talk," will most probably make up his mind to accuse me of contradiction, since projecting and carrying out the plan of this book are rather discordant. I acknowledge the fact unhesitatingly, but as old Mrs. Means says in Edward Eggleston's witty: "Hoosier school-master," when she puffed away between hours, "Git a plenty while you're a gittin'," so say I. I

thought, some small or big talk, as you like, on national economy and "sich" matters would do no harm, even if some morose husband who expected to make a bargain when he bought this volume, should feel inclined to indulge in a sound scold at my expense for his money which is now my own or rather the publishers.

"I got it in," says the lawyer by himself when His Honor reminds him of having said something to which, according to the blindness of justice and law, the ears of the gentlemen ought to be deaf.

And so, gentle reader, I will no longer take up your time which is money, you know; the poor defendant repents of his infallible sins, and I only ask for him your merciful recommendation to the mercy of the court.

All is well that ends well.

TEN YEARS'

PRACTICAL EXPERIENCE

IN

GRAPE AND SMALL FRUIT CULTURE,

BY

HUGO PREYER,

CANTON, OHIO.

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