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CULTURE OF THE

GRAPE:

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BY J<sup>Edwards</sup> FISK ALLEN.

EMBRACING

DIRECTIONS FOR THE TREATMENT OF THE VINE, IN THE NORTHERN STATES OF AMERICA, IN THE OPEN AIR, AND UNDER GLASS STRUCTURES, WITH AND WITHOUT ARTIFICIAL HEAT.

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THE HISTORY OF THE

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## INTRODUCTION.

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THERE are several works published in England, written by practical men, giving ample directions for the cultivation of the grape in that country; but the climate of the Northern States of America is so different from that of England, that, however well calculated these directions may be for the latter, they can hardly be expected to suit the former. The temperature of England is milder, and is not subject to the great extremes of heat and cold which we experience. The searching northwesterly winds, which prevail with us in New England in the winter and early spring months, with the mercury often at zero, and even below that point, and the sudden changes we are liable to, in this season of the year, often equal to forty degrees in a few hours, render the care requisite, for the successful forced culture of fruit, very great, and the process a more difficult one, *in this country*, than in England.

Do not build a grapery under the erroneous impression, that, having done so, and planted the vines, you have secured to yourself, without further labor, a bountiful supply of fruit; if you do so, you must be sadly disappointed.

Probably there is no plant so sure of yielding an annual crop as the grape, under right management; but this is absolutely necessary, to ensure success.

The attempt has been made to give plain rules, which may be easily understood, and the practical operation of which can be carried out with as little labor as the proper cultivation of the grape, under glass, will permit.

The following directions are intended for those who may desire to cultivate this fruit, for their own pleasure or convenience, and do not wish to incur the expense of a regularly educated gardener, and who have felt the want of a concise and simple explanation of the process, and the rules by which these operations of forcing and of growing grapes, under glass structures, can be carried out.

The treatment recommended is such as has been found to be the best, after many years' experience, in its cultivation; during which time, the different systems of pruning have been all tried, and many of the vineyards in France, and on the Rhine, in Italy, and other countries have been visited, and the manner of pruning, the varieties of soil, and the amount of fruit which a vine is permitted to ripen, have been examined and ascertained.

The disadvantages we labor under, in this country, in forcing fruit, from the extreme coldness of the weather in winter, are counterbalanced, in some degree, by the superior brilliancy of the sun, and consequent dryness of the atmosphere, at the time of ripening, which gives a flavor to the fruit, such as it can rarely be made to attain, in the moist, dull, and cloudy weather of England. The variations of the temperature are always indicated by a Fahrenheit thermometer.

THE  
CULTURE OF THE GRAPE.

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THE GRAPERY.

FIRST in order, and of the utmost importance, is the situation of the house. It must be so located, that stagnant water will not remain on the border, or within reach of the roots of the vine.

If you cannot avoid building the house where water is found to stand two or three feet under the surface, then the soil should be thrown out, the whole length and breadth of the border, eighteen inches deep, and the bottom paved, with stone or brick, so as effectually to prevent the roots penetrating through it, to the water. Make the border on this, as directed hereafter; this will raise the top of the soil eighteen inches above the level of the adjoining surface.

The house should front the south; a slight variation, provided it is to the east, so as to receive the morning sun, will be no objection.\*

The common lean to house is the best for forcing; from thirteen to fifteen feet high on the back, four

\* Cultivators of the grape have usually advised this position for the front of the house; several persons, who have had practical experience, would prefer that it should front south ten or fifteen degrees east, or even south southeast.

feet on the front, and twelve feet wide on the inside, are suitable proportions; the length of it can be as desired, from twenty to one hundred feet, or more.

The front of the house should be framed, the sills standing on, and secured to, stone, or locust posts, set four or five feet under ground, and eight feet apart, thus giving the roots freedom to roam at their pleasure. The floor of the house should be on a level with the surface of the border. The back wall may be either of brick or wood. If the house is to be used for forcing fruit, it should have a double wall on the back. A span-roofed house is the best for a cold grapery. It should be, above the sills, on all sides of glass, and of the following dimensions:—twenty feet wide, and of any length desired; the upright sides above the sills, six feet high; the rafters should be twelve feet long; this will make the height of the house, at the ridge-pole, or centre, on the inside, fourteen feet. The sills must be secured to stone, or locust posts, placed eight feet apart, and sufficiently deep in the soil to be free from danger of being thrown by the frost. Place the house fronting south southeast. You may plant three sets of vines,—one in the centre, and one on each side. Upon a house of this description, the sun's rays will rest from morning until evening, and the crop will come rapidly to maturity.

#### PREPARATION OF THE BORDER.

The border should be twenty feet wide, for each set of vines,—if thirty feet, the better,—and two and a half or three feet deep; if you have but little room,



you can manage to grow very fair grapes with twelve feet of border; but, in this case, you must not plant the vines so close together. The following course is recommended in preparing the border:—

If the soil is a good loam, begin at one end and trench it; mark off ten feet the entire width; throw out the soil two feet deep; if bones, or the carcasses of animals can be had, cover the bottom well with them; if these are not readily procured, slaughter-house manure may be substituted; mark off ten feet more of the border, and cover this manure with part of the soil from it; upon this, put an inch or two of oyster shells, or old lime rubbish, mixed with broken bricks; over this, put some soil from the border; then a good covering of cow manure; upon this, a slight covering of loam again, followed with a good portion of oyster shells, or the substitute; and over this, a thick covering of stable manure, well rotted; finish with a covering of the loam. The whole length is to be made in this manner, in alternate spaces of ten feet each trenching. After it is finished, the border should be three feet six inches deep; it will settle to less than three feet in a few months; any soil left, after it is finished, can be carried off.

The proportions recommended for this border, are one half loam, one fourth bones, or other strong manure, one eighth oyster shells, or lime and brick rubbish, and one eighth rotten stable manure.

Before planting the vines, the border should be spaded over, to mix well the top substances, being careful not to disturb the strong manures at bottom.

Should the soil be poor, decrease the proportion used in preparing the border, and, in the same ratio, increase the manures, or substitute the top soil of a loamy pasture.

If the soil is very poor, or unsuitable for the purpose, so as to require to be removed entirely, then a compost prepared thus, is recommended:—one half to be the top soil of an old pasture; one quarter to be bones, or some other strong manure; one eighth oyster shells, or lime and brick rubbish; one eighth rotten manure; these articles thrown together in a heap, and so to remain until decomposed and amalgamated, when they should be placed in the border, and thrown loosely together.

If it is intended to plant vines, to be trained on the back wall, the soil on the inside of the house must be prepared, as directed above.

If figs are to be planted, the same border is recommended.

Peaches do not require a rich border, and for them the natural soil will be suitable.

To improve a poorly made, or exhausted border, in a house already built, where the vines do not succeed well, the following process is recommended as best adapted to cure the original defect:—

In the spring, have the border covered with two or three inches of lime rubbish, or oyster shells; let this be forked into, and well mixed with, the soil; after this, have the whole border covered, two feet deep, with fresh stable manure,—the newer the better; the object being to cause a strong heat above the roots of

the vine, thus drawing them to the surface. This should remain on the border two months, when it may be removed. It is probable, the young roots will have penetrated the border, and be growing in the under part of the manure; if so, these must not be injured, for if they should, the benefit expected from the operation would be lost; when it is found that this is the case, that part of the manure must remain on. After removing the manure, the border should have a top dressing of three or four inches of well decomposed cow or hog pen manure.

#### PLANTING THE VINES.

In planting, which is the next operation, open a hole sufficiently wide to admit of the roots being spread out to their entire length; care must be taken to spread out all the roots separately, without injury to the small ones, and do not let them overlay or interfere with each other; make the soil fine, and cover them with an inch or two of it; with a rose watering-pot, settle the soil and roots, by giving them a thorough watering; finish covering, and do not water them again. They should be planted about three inches under the surface, and three feet apart; if the border is only twelve feet wide, five feet is near enough. If the house has been built on posts, as directed, let the head of the vine, after planting, be three inches from the front, on the inside,—the roots being on the outside. If the vines are planted in the fall, they should be cut back to three eyes immediately; but, if planted in the spring,

they must be allowed to grow until the shoots are one inch long, when rub off all but the three lower shoots.

#### VINES FOR PLANTING.

The vines for planting should be in pots, and one or two years old; before planting, they should be kept quite dry a few days, as the roots are more easily separated.

If the plants are growing, leave off watering them until they begin to droop, when you can plant them out; the risk of injuring them will be lessened, and the free watering, after the roots are spread out, will immediately settle them in their position, and they will grow rapidly.

If grown on the place, or to be obtained near, young plants, in pots, just rooted, can be used. Turn them out with the ball of earth entire, and plant, without disturbing the roots, on the inside, near the front of the house. I have planted such vines, and they have come into bearing as soon as older ones; they are to be preferred to old vines, as the latter are very much injured in transplanting, if they have been growing in the open border; if in pots, the roots are so matted together, that, in separating them, many will be broken off.

#### TREATMENT OF THE VINES.

##### *First Year.*

The first year, they should not be forced, but allowed to push naturally as the season advances.

In the vicinity of Boston, they will push their buds early in April; let the shoots from the three eyes grow

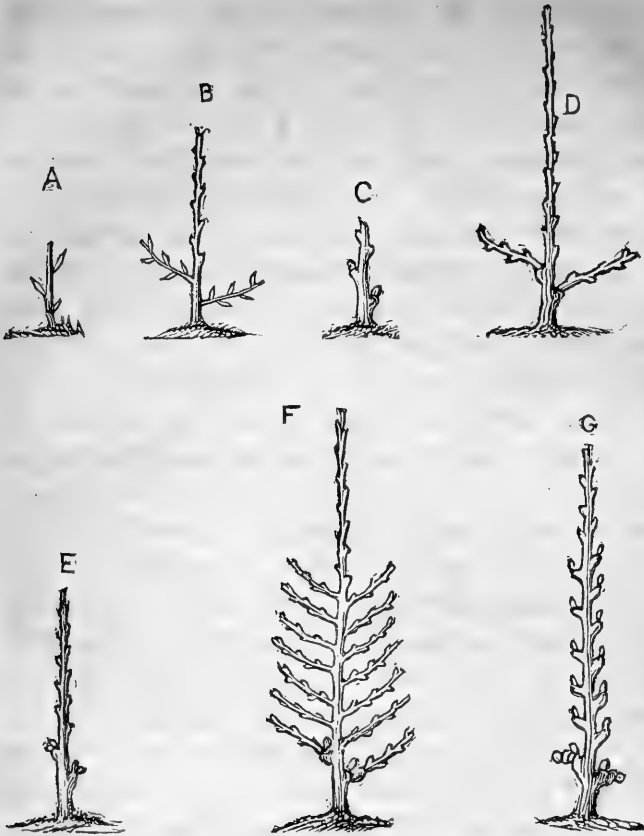
until they are two or three feet long; train up the leading one to the roof, and stop the other two, by pinching off the end of each; the leading cane must be stopped, when it reaches the top of the rafters; the vine will be strengthened, by allowing it to make a free growth; after September, stop all shoots as they push, that the vine may the better ripen the wood.

Early in the spring, throw open the house and give air freely, continuing to do so during the season, when the mercury is above freezing; it is best to shut up the house at night, leaving one or two lights a little open, to let the moisture escape.

After the leaves have fallen, which will be in October, or early in November, cut back the two spurs to one eye, or bud, each, and the long cane to two eyes. If any insect has been troublesome, wash the vines, carefully, with soap suds, moderately strong. The first of December, protect the vines for the winter, by a covering of straw, or Russia mats; the border must also be covered with seaweed, or coarse litter, to protect the roots from frost. This completes the management for the first year.

### *Second Year.*

The second year, as the spring advances, and the power of the sun increases, open the windows and doors of the house to let the heat escape, and to prevent the vines bursting their buds, shutting up again before night; do not hasten the pushing of the vines, but rather keep the house cool until the tenth of April,



*A*, is the vine after it has been cut back at planting.

*B*, shows it at the end of the first year.

*C*, shows it cut back at the fall pruning of the same year.

*D*, the end of the second year.

*E*, at the end of the second year, cut back for fruiting.

*F*, at the end of the third summer.

*G*, the end of the third summer, cut back.

If the spurs become too long in a few years, you must allow one of the shoots, that are constantly pushing on the back wood of them in the spring, to grow, and, at the fall pruning, cut back to it.

when it will be best to uncover them ; promote a free circulation of air in bright weather ; give some ventilation on cloudy days ; shut up the house before the sun sets. About the middle or last of May, the four eyes will have grown, each, one or two feet ; train up the strongest of the two on last year's wood, and shorten back the other three, by pinching off the ends of the shoots ; during the season, give plenty of air, in fine weather, and shut up the house at night. The best way of training the vines, is by iron rods, parallel with the rafters, having three of them ; a centre one, to which should be tied the cane, and one on each side of this, about eight inches distant, to tie the bearing shoot to ; in a cold house, they should be ten inches from the glass, and, in a forcing one, fourteen inches.\*

As the leading cane grows, tie it carefully to the rod, or trellis ; stop all the laterals, as they appear, at one eye, or leaf ; continue to check them, as they push again, in the same way. The second shoot, on last year's wood, may be cut entirely out in June, or, as soon as it is certain that no accident to the leading cane will require the use of this as a substitute ; the shoots on the spurs of the old wood must be stopped, as often as they push, by cutting them back to one eye.

Stop the leading cane when it has grown about fifteen feet, and before it reaches the top of the house ; allow the upper lateral to grow ; this will prevent the eyes, on the upper part of the cane, from bursting.

\* Some persons prefer the rods to run horizontally, the whole length of the house.

This lateral should be cut back to one eye, after it has grown three or four feet; if it still continue growing strong, check it again.

Early in July, dust sulphur on the floor of the house, to prevent mildew; to be effectual, one pound should be used for every twenty square feet of the house. If mildew should make its appearance, and continue to increase, syringe the vines at evening, and dust the foliage also with it.\*

In September, begin at the lower part of the cane, and, with a sharp knife, cut clean out all the laterals, for eight or nine feet, leaving those on the upper part of the cane to be cut out in the autumn pruning; be careful, in doing this, not to injure the bud, or the leaf of the cane, where you cut, for, from this eye, your fruit is to come next summer.

As soon as the leaves are falling, cut back the cane to eight or nine feet, and the two spurs to one eye, each.

With a painters' brush, put on the vines a composition of soft soap and sulphur, in the proportion of four pounds sulphur to two pounds of soap; be sure to cover all the wood, and particularly around the eyes. To prepare this wash, mix the two substances well together, when cold, and pour hot water upon them; it should be of the consistency of cream when put on the vine.

\* Nathaniel Silsbee, Jr., Esq., informs me, that, in his grapery, which is a cold house, he covers the floor twice, every summer, with the sulphur, and recommends its application in the middle of the day, as, at that time, part of it will rise and settle on the vine, but, in such small particles, as to do no injury. He has found this effectual in preventing mildew.



The first of December, lay down the vines, horizontally, near the ground on the front of the house, and cover them from the sun. Russia mats are the best for this purpose; cover the border as last year.

This will end the second season of their growth. So far, we have considered the house a cold one, or without fire heat; if the vines have been planted in a greenhouse, and a fire kept up, then they will have started in February or March; if they are so situated, let the house be kept at as low a temperature, night and day, as the safety of the plants will admit; the treatment should be the same, for the season, except the covering of them with mats, which would be unnecessary.

### *Third Year.*

The third season, air the house, as directed the last year; uncover the vines from the first to the middle of April, as the spring may be mild or cool; keep them in their horizontal position, until the eyes have all pushed; have a moist atmosphere, by sprinkling the vines and the floor, several times, every day. About the twentieth of April, or the first of May, they will have pushed their buds so as to be all ready to be put to the rods, or trellis.

During the season, give air freely when the sun shines; shut up the windows towards night, as the sun recedes from the house. The mercury should not rise above seventy-five, until the blossom is over; after that has passed, eighty or ninety, at midday, will do no harm; occasionally wet the floor of the house in the afternoon; the inside border must be

watered, as often as the roots of the vine require; continue this treatment for the season. As the grapes begin to color, be cautious in watering, and, after they are fully colored, do not give water at all, until the grapes are all cut, leaving open some of the lights at night, unless there is danger of frost, or rain.

About the last of May, the shoots will be from one to three feet long; train up the leading one, the same as last year, and cut back the others to one leaf beyond the bunch of fruit to be retained for ripening; the bunch nearest the cane is the one usually left on for this purpose;\* cut off all the others; never leave more than one bunch on a spur, and cut away all the fruit from every alternate spur; when this is done, and there is still more than eight good-sized bunches remaining, reduce them to this number; these will be quite enough for the vine to mature, the first year of bearing; if the bunches are very large, you must cut off still more; do not allow over ten pounds of fruit to ripen on each vine; they probably will average not less than one pound to the bunch.

Occasionally, it will be necessary to go over the vines, and stop the laterals that push on the leading cane and on the spurs, by cutting them back to one eye; it will be found a saving of labor, to perform this pruning at regular intervals of a fortnight during the season; continue this, until they cease growing; the leading cane should be stopped as soon as it reaches

\* It sometimes happens, that a spur will have four or five bunches on the shoot, the nearest one to the cane being at the second leaf; when this occurs, it is best to leave, for ripening, the second bunch, cutting away the others.

the top of the house, leaving one or two laterals at the top to grow a few days, when you should cut back one of them, and leave the other a few days longer, when that must be cut back also. I do not syringe the vines after they are trained to the trellis, and do not think it ever necessary, provided the house is kept moist by watering.

The vines will begin to bloom early in June; when the berries are as large as peas, begin to thin them; cut out all the small ones first; no rule can be laid down, as to the number to be taken out of each bunch, for the same kinds set their fruit more or less thickly in different years, and in different situations. Of Black Hamburgh, I usually cut three out of five berries; of Zinfindal, eight out of ten; of Chasselas, when they set well, five out of ten: experience will soon teach one what is proper to be done. If the shoots from the spurs have not been tied to the rods, they should be, as soon as the thinning is over; do this carefully, and let them be at equal distances; a little attention to this will improve the appearance of the vines very much.

Examine the bunch as the grapes swell; if they are pressing together, cut out still more, always taking the smallest berries. In thinning, avoid touching the grapes with the hand; the moisture of the flesh causes rust; if it is necessary to handle the bunch, gloves should be worn. After they begin to change color, if it is necessary to thin them more, the scissors must be used cautiously, in order not to injure the bloom, and thereby destroy the beauty of the bunch.

Early in July, spread the sulphur, as directed the last year. The grapes will begin to change color in August, and to ripen about the middle of September.

When ripening off, if the berries do not swell or color well, and, in black varieties, are of a pale red color, feeling soft, if touched, you may be assured the vines are not strong enough to ripen the crop; cut off the lower part of the bunch of some, and the whole of others, selecting, for this purpose, the bunches which are the most affected in this way, and reducing the quantity on the vine one third, or one half, and do so as soon as you suspect this is the case; by these means, you may save the residue of the crop, and, at the same time, relieve the vine from the exhausting effort of attempting to mature it. This is a trouble caused by overcropping, and is entirely distinct from what is usually termed shanking; for this disease, after it has once taken hold of the bunch, there is no remedy; the part affected must be lost. In September, cut out all the laterals from the new cane, as directed last year.

This treatment of the vine will give you delicious fruit, well-colored, and, consequently, high-flavored; in black grapes, as a general rule, it may be laid down, that, *when fully ripe*, the blacker the grape, the more spirited and richer the juice; bunches weighing about one pound are usually better ripened than larger ones. The berries of the Black Hamburg, grown by these rules, will measure three and four inches round. This grape is often grown of a slightly reddish tinge, and

sometimes with very large berries, very sweet indeed, but deficient in flavor.

This is a simple process, but the practical operation of it involves much labor and unremitting attention. After all is done that is required by pruning, thinning, watering, &c., much depends upon the proper ventilation and heat of the house; this must be opened and shut as the weather changes; if clouds are constantly passing during the day, and the sun alternately obscured or shining, it will be difficult to regulate the temperature; a partial opening of the top lights will allow the heat to escape, and prevent too great an accumulation of it; the person having charge will soon, by attention, ascertain how much ventilation is required under such circumstances.

It will be preferable to have a low temperature, and changing between sixty-five and eighty, than by having the house closed, the heat raised, for even a very short time, to one hundred, or one hundred and twenty, which would be the case in changeable weather, should the sun shine forth suddenly, and the house be entirely closed. This must never be allowed, but, as soon as there is a prospect of the sun shining, open the lights a little, and continue opening as the heat increases.

Avoid sudden changes of the temperature as much as possible, and the air should, at all times, be admitted gradually.

Never allow any of the leaves of the vine to be taken off for the purpose of admitting the sun to the grapes.

If aphid, or the vine fretter, appear on the vine,

fumigating the house with tobacco will destroy them. If red spiders are troublesome, moisture and sulphur are the only remedies; syringing the vines at evening, and dusting the leaves with flour of sulphur.

In September, all but the last lateral on the spurs should be cut out.

When the leaves are off, early in November, cut back the leading cane, leaving four feet only of the new, or this year's growth; this will now make the entire length of the cane twelve or thirteen feet; cut back, close to the old wood, the spurs that have fruited this year; those that have not, cut back to one eye or bud, to bear fruit the coming season; clean and put over the vines the soap and sulphur, as before; and the first of December, lay them down and cover them, as last season.

If the spurs are too close together, you can cut out those that are not wanted; they should not be nearer together than four inches; this would make them eight inches apart on each side the cane, and closer than they are often grown; if nearer, they would obstruct the light.

#### *Fourth Year.*

The fourth year, follow the same directions for ventilating, giving air, and watering the vines and the floor of the house as heretofore.

After the vines are secured to the trellis, and the shoots are one or two inches long, rub out, from the spurs which were cut close, all but one shoot; this you must leave to grow for future use; do not allow it to bear fruit this season.

If the vines are strong, and were not injured by overbearing last year, you can now leave on each vine fifteen bunches, that will weigh one pound each, to ripen this season; let the bunches be distributed, at proper distances, over the vine. The leading cane should not be allowed to bear fruit until it has become established at the length desired for permanent use, when it can be fruited as well as the other shoots. Very strong, healthy vines will often show, on this length of cane, sixty to one hundred bunches; and it requires some firmness in an inexperienced person, to cut out in this free manner.

Prune at the same time, and in the same way, as last year; and, at the autumn trimming, leave four feet more of the new cane; this will now be sixteen or seventeen feet long, and of sufficient length to bear as large crops as the vine should ever be required to do. In November, clean and place the vines, and protect them from frost, as heretofore.

#### *Fifth Year.*

Fifth year, the same general treatment is to be pursued; the leading cane must be stopped at the top of the house, leaving two or three of the extreme laterals to grow a short time, and stopping them at intervals of four or five days, the top one first.

You may now allow the vines to bear twenty pounds of fruit, and, as they grow older and stronger, you can increase the weight to twenty-five pounds. I have never seen more than this quantity ripened on a vine, in this country, without injuring the crop the year

after. It is true, we often hear of much larger crops, but my experience will not warrant any thing of the kind.\*

It is unusual to see a bunch of Black Hamburgh grapes weighing more than four pounds. At the exhibition of the London Horticultural Society, at Chiswick, on the ninth of July, 1836, there was shown a very fine bunch of this variety which weighed eight pounds and six ounces; it is mentioned in Loudon's Magazine as "hitherto unrivalled;" see volume twelfth, page four hundred and forty-fourth.†

A simple furnace and flue, to run along the front of the house, even when it is not intended to force, is desirable, as a small fire can then be made in wet weather, and, after the fruit is ripe, by keeping the air dry, you will be able to preserve the grapes sound a great length of time.

The fall pruning of the fourth year will leave the vine established at the proper length at which it may ever remain; the fall trimming the fifth year, and ever after, will be the same as that of the fourth,—cutting the leading cane back to the dormant eyes.

\* In England, there are two very remarkable vines, which are said to produce, yearly, over two thousand bunches. One of these, that at Hampton Court, I saw in the summer of 1836; it then was bearing a crop of over two thousand bunches; they were generally small, however, and the berries were not large; the man having charge of the house said that it did not look as well as usual. In 1846, a gentleman who visited it, describes the bunches as small, but numerous, and looking well; the roof of the house is covered with the vine; it is trained horizontally, and passes, two or three times, the whole length of the roof; the pruning is on the spur system, but a shoot is laid in, wherever wanted to fill a vacant space.

† I had the satisfaction of seeing this bunch of grapes; it probably is the largest bunch of this kind ever grown.



If, after a series of years, the cane should become too long, it can then be cut back to the next spur from the top.

#### REMARKS ON FORCING THE VINE.

If it is intended to winter-force, you must not commence the process, the first year, before the first of March; the second year, you may begin the middle of February; the third year, the first of February, and so on, fifteen days earlier every year, until you reach the first of December; beyond this you can hardly go, as this allows only time to prune and clean the vine after it has gone into rest.

The first of March is recommended as the best time to commence fire-heat for the main crop of grapes; this can hardly be considered as forcing; it is a simple protection and aid to the natural growth, and as heavy crops can be matured as in a cold house.

In a house that is forced in December or January, every year, ten pounds of grapes is quite as much as each vine will perfect, on an average of years.

Before making the fires, the border must be attended to; if it was covered in the autumn with coarse litter or leaves, as directed, it should now have a quantity of fresh stable manure added, and well mixed with the litter; cover the whole border to the depth of eighteen inches, and protect this from the cold rain and snow with boards; this will effectually prevent the frost from penetrating to the roots. The management of the vine will be the same as directed for the cold house; the pruning, thinning, and training must

all be done in the same manner. Forcing, earlier than the first of March, is attended with much more risk of failure; the expense and trouble are more, and these are all increased in proportion as you begin before this time.

#### DIRECTIONS FOR MANAGING THE FORCING-HOUSE.

Commence forcing your house with a temperature of  $40^{\circ}$  at night,  $60^{\circ}$  by day; admit air freely when the sun shines; upon the furnace and the flues, place pans of water; the vines should be kept in a horizontal position until they are pushing strong; syringe or wet them repeatedly during the day, and keep the air of the house moist by watering the floor. After ten days, raise the temperature to  $45^{\circ}$  by night,  $65^{\circ}$  by sunshine; continue to keep the house moist until the vines have all broken well, and have been put up to the trellis, when you can lessen gradually the watering; let the pans of water, on the furnace and flue, be constantly filled while the grapes are growing; after they begin to color, lessen the number of pans of water gradually, and the moisture of the house, and ripen off the fruit in a dry atmosphere.

In ten days more, raise the temperature to  $50^{\circ}$  or  $55^{\circ}$  at night, and by day, when cloudy, to  $65^{\circ}$ , or, when the sun shines, to  $75^{\circ}$ . This temperature should be gradually raised at night until the grapes are in bloom, when the heat should be as equal as possible,  $70^{\circ}$  at night,  $75^{\circ}$  or  $80^{\circ}$  by day, when the sun shines. Do not let the temperature of the house, by artificial means, rise above  $70^{\circ}$  in this stage of forcing.

In May and June, we often have some very hot days, with a bright sun and dry air, the temperature in the open air  $80^{\circ}$  or  $90^{\circ}$ , and even higher; in such weather, you cannot prevent the heat of the house rising to over  $100^{\circ}$ ; if the air should be very dry, it would burn the leaves, and injure them more to have all the lights and doors thrown wide open, than a greater degree of heat with proportionate moisture would do.

The shrivel in grapes is caused, frequently, by too large a crop; sometimes by too much moisture at the roots, and often by a sudden change of air, or too low a temperature; the best preventive for the two latter troubles is a constant free circulation of warm air.

In the management of your house, aim to imitate nature, by a regular increase of heat, as in spring.

Early in October, you may cut back the spurs to two eyes, if you think the wood is not ripening well; be careful and do not cut, or otherwise injure the remaining eyes, or their leaves; this will admit more sun to the house, and promote a free circulation of air, and strengthen the eyes retained.

In winter, the mercury, in the open air, frequently falls to zero, and sometimes six and ten below, with a high wind blowing at the same time.

In January, February, and the early part of March, for weeks together, it will be found, during the night, ranging from ten above, down to, zero. In such a climate, a powerful and steady heat is necessary.

The boiler and pipe to circulate hot water around the house, on the level principle, together with the furnace and flue, are recommended as the best and

safest heating apparatus. A furnace and flue will not heat more than twenty-five feet of a grapery that is forced in the winter months, and, for any additional length of the house, other furnaces must be added, in the like proportion, or the hot water apparatus substituted.

The following is a memorandum of the regulation of the heat, with the dates on which the different operations were performed, in a house forced in the winter of 1846 and 1847:—

November, 1846.—The vines were pruned; every alternate spur was cut at one eye to fruit; the others were cut close, as there were more spurs than the strength of the vine would admit of fruiting the coming season.

When the vines were not of sufficient length for the rafters, we retained as much of the new cane as was required, or as the strength of the vine would allow.

The loose bark was rubbed off, and the vines painted over with the composition of soap and sulphur.

The border was covered with litter.

The first of December, the vines were placed in a horizontal position, near the front of the house, and covered with Russia mats; those on the back of the house were laid down and covered in the same manner.

December 20th.—The fires were made, and forcing commenced; the temperature of the house was kept at 40° at night, 60° by day; fresh stable manure was put on the border, and well mixed with the litter already there; the vines, and the floor of the house, were repeatedly watered, and pans of water placed on

the furnace and flues; this temperature was kept up, and the watering continued, until—

January 1st, 1847,—when the temperature was raised to  $45^{\circ}$  at night,  $65^{\circ}$  by day, and air freely admitted, when the sun shone; wetting the house and vines continued.

January 5th.—The temperature was raised, at night, to  $50^{\circ}$ ; by day, if cloudy, to  $65^{\circ}$ ; when the sun shone, to  $70^{\circ}$ , with plenty of air admitted, and the pans of water daily replenished. This heat was continued to—

January 10th,—when, at night, the temperature was kept at  $50^{\circ}$  to  $55^{\circ}$ ; by day, if cloudy,  $65^{\circ}$ ; when the sun shone,  $75^{\circ}$ , with air; the top windows were let down, every other light, three or four inches in the morning, and as the heat increased, more air was gradually admitted.

When the house became quite warm with sun heat, the front lights were opened a little. In very cold days, and with a bright sun shining, the windows were not opened more than four inches; watered the house freely in mild weather, giving less in very cold; the pans of water were kept full. This treatment was continued to—

January 20th,—when the temperature, in cloudy weather, was raised to  $70^{\circ}$  by day; during the night, and on sunshiny days, the same as from the tenth instant; and this was continued to February.

The vines, near the furnace, were all pushing, both sets at the same time, those planted on the outside of the house, and those on the inside. The mercury, in the open air, last night, was at zero; in the house, at

9, P. M., it was  $55^{\circ}$ ; at 7, A. M.,  $48^{\circ}$ , with as large fires as the furnace would allow.

January 25th.—Nine of the vines, which were nearest to the furnace, were tied to the rods.

January 27th.—Put up sixteen more.

February 1st.—The temperature, at night, was kept at  $55^{\circ}$  to  $65^{\circ}$ ; by day, and when cloudy,  $70^{\circ}$  to  $75^{\circ}$ ; by sunshine,  $75^{\circ}$  to  $85^{\circ}$ , giving air as above; and this temperature was continued until the blossom was over; the remaining vines, on the front of the house, were taken up and secured to the rods.

February 2d.—The vines, on the back of the house, were tied to the trellis; some of the shoots, on the vines near the furnace, were two feet, and some three feet long; they were cut back to one eye beyond the fruit.

February 10th.—Rubbed out all but one shoot on each spur, where it had not been done before;\* the spurs which were cut close have generally pushed, from dormant eyes at their base, from two to six shoots, and most of the shoots had fruit bunches.†

February 15th.—First blossoms opened to-day on three of the vines; shortened back, and tied out to the rods, the side shoots on several vines.

February 21st.—Blossoms have opened on the eight vines nearest the furnace, and, on the two first, the berries are swelling off; continued to stop, and to tie up, and to thin out, any of the shoots that are not wanted.

\* This can be done as soon as the shoots are one inch long, shortly after the canes are put up.

† The tendrils should be cut smoothly out when they first appear.

March 1st.—The temperature, at night, was kept at  $60^{\circ}$  to  $70^{\circ}$ ; by day, when cloudy,  $70^{\circ}$  to  $75^{\circ}$ ; by sunshine,  $80^{\circ}$  to  $90^{\circ}$ ; as much air admitted as could be, with safety, allowed; began to thin some bunches on three vines; ten vines were in blossom on the front, and four on the back of the house.

March 10th.—More than half the vines were in blossom, and the grapes thinned on eight vines; the laterals on the spurs were cut back to one eye, and this check was repeated as they required it.

March 15th.—Temperature the same as from the first of the month; have been thinning the grapes the past fortnight; they are now finished, for the first time, and the earliest vines have been thinned two or three times.\*

April 1st.—Temperature the same as in March; from day to day have been examining and thinning the berries, when it was found necessary.

April 10th.—The first grapes began to color, near the furnace, this day. Temperature as above.

April 20th.—The Zinfindal, Early Black July, and Grizzly Frontignan coloring; the Pitmaston White Cluster nearly ripe, and the Chasselas Bar Sur Aube changing color.

May 1st.—The temperature, at night,  $70^{\circ}$ ; by day, if cloudy,  $75^{\circ}$  to  $80^{\circ}$ ; by sunshine,  $85^{\circ}$  to  $95^{\circ}$ , with air freely admitted. The first Black Hamburgh grapes begin to color; the pans of water were removed from the furnace and from the flue, where the grapes have

\* The shoulders of very large bunches (the Syrian) always require to be spread out and supported by strings, to permit a free circulation of air.

colored, or are nearly ripe; the bunches were examined, and all defective berries cut out; all thinning, for the season, was now finished.

May 10th.—The grapes were ripe on the first five vines; part of the fruit, from Chasselas Bar Sur Aube, Zinfindal, Early Black July, Pitmaston White Cluster, and Grizzly Frontignan, has been gathered; more of the pans of water were removed from the flue.

May 20th.—Cut Black Hamburgh grapes, fully ripe; the grapes were all ripening in every part of the house, and have colored well; all the pans of water were now removed, and the house kept as dry as possible.

June 1st.—The weather now being warm, the making of fires was omitted, excepting in wet weather, when small fires were made in the day-time, and the house was opened for ventilation.

June 10th.—Half the crop was fully ripe, and the residue colored. After the grapes were all cut, the sashes were kept open night and day, and they should be continued so until cool weather, when it will be best to close the sashes and doors at night, to exclude hard frosts.

In July, there is every probability that the red spider may appear on the vines of a house that has been winter-forced; to destroy them, syringe the vines in the afternoon frequently, and dust sulphur all over them; if this does not kill them, wet the flues and the floor of the house thoroughly, and dust both of them well with the sulphur; make a fire in the furnace to cause the sulphur to send out strong fumes;



you may melt it, but by no means allow it to burn; shut up the house close, and give it a good steaming; open it early in the morning; this should be done in the afternoon, before the sun has ceased to shine upon the house.

#### RETARDING HOUSE.

The retarding house should be built upon the same plan as the forcing house; it is not necessary that it should be so wide, or so high on the back.

The pruning and training of the vine is the same as in the cold house; the thinning of the berries will be performed later than in any other house, and care should be had that it is thoroughly done, and more severely than in any other way of growing them.

Early in March, the sun must be excluded from the house; this can be done by spreading sails, or mats, over the glass; the doors and lights must be open day and night when the temperature is above freezing.

In May, when the vines push their buds, the covering must be removed from the glass; keep the temperature as low as possible, night and day, during the summer; the end of May, or early in June, the vines should be put to the rods, or trellis.

Early in July, the grapes will be in blossom; apply the sulphur now to the floor of the house, and observe the vines carefully during this and the next month; if the mildew appear on the wood, fruit, or foliage, shut the house at night, and apply more sulphur. Never allow it to remain on the fruit; if, by accident, any should get on, brush it off immediately,—opening the

house by day, as in any grapery. Early in August, the grapes will require to be thinned.

In October, when the nights become cool, close the doors and windows, (*where it has not been done before on account of mildew,*) giving as much air, and keeping as low a temperature, (*when the sun shines,*) by day, as possible.

In November, small fires must be made and kept up in the night-time and in cloudy weather.

The fruit will be ripe the last of November and in December; after which, the house must be kept as dry as possible, having sufficient fires to keep out the frost.

After the fruit and foliage are off, prune the vines, and protect them from the frost.

The following list is recommended for planting in the retarding house, and in the proportions named:—

Black Hamburgh, five vines, including, with this variety, the Wilmot's New Black Hamburgh.

Muscat of Alexandria, two vines.

Zinfindal, two vines.

Black Lombardy, five vines.

Charlsworth Tokay, two vines.

Whortley Hall Seedling, three vines.

Aleppo, one vine.

Tottenham Park Muscat, three vines.

Syrian, one vine.

Chasselas de Bar Sur Aube, one vine.

Black Prince, one vine.

St. Peter's, (old,) one vine.

Black Frontignan, one vine.

## VARIETIES OF GRAPES FOR PLANTING.

For planting, I would recommend the Black Hamburg grape as the best for the greatest number of vines.

The Grizzly, the White, and the Black Frontignan are all admired by those persons who like the Muscat flavor; they are liable to shrivel, and are more delicate than other grapes, and do not keep well when ripe; the Grizzly is the earliest of them.

The Muscat of Alexandria is a large oval grape; it does not set well under glass, and requires artificial impregnation;\* it is a firm-fleshed or breaking grape, and, when well ripened, cannot be exceeded in richness.

Tottenham Park Muscat is very like the former, but not so high flavored; it sets its berries better.

Chasselas Bar Sur Aube is a fine white grape, and a good bearer.

Pitmaston White Cluster has rather small berries, but is very early and good.

Syrian, white, has very large bunches, sometimes weighing twenty pounds. I have never grown them over five pounds. This is a tolerably good grape, if allowed to hang until of an amber color.

Verdelho is a small oval white grape, very good, and a great bearer.

\* Otis Johnson, Esq., of Lynn, a successful cultivator of the grape, the present year, allowed the shoots of this variety to grow at random until the fruit was swelling, and he thinks the result of the experiment has been favorable: the fruit has set remarkably well.

Black Lombardy is a late grape, and will hang a long time after it is ripe.

For a cold house, I would recommend the following :

Black Hamburgh,	Pitmaston White Cluster,
Rose, or Red Chasselas,	Golden Chasselas,
Chasselas de Bar Sur	White Gascoigne,
Aube,	Royal Muscadine,
White Frontignan,	Wilmot's New Black Ham-
Grizzly Frontignan,	burgh.

For a forcing house :

Black Hamburgh,	Golden Chasselas,
Red, or Rose Chasselas,	White Gascoigne,
Chasselas de Bar Sur Aube,	Royal Muscadine,
White Frontignan,	Wilmot's New Black Ham-
Black Frontignan,	burgh,
Grizzly Frontignan,	Muscat of Alexandria,
Pitmaston White Cluster,	Zinfindal.

The Early Black July may be added, if it is desired to get early grapes ; this is a small grape, of a pleasant flavor, but no earlier than the Pitmaston, and only desirable for its color. They will both, if planted in the warmest situation, come on together, and much before the Black Hamburgh. The Grizzly Frontignan is also an early grape.

The list above embraces a good number of the best varieties ; there are several new kinds well spoken of, but which have not been sufficiently tried in this country to prove their qualities. The Chasselas Musqué cracks very much, thus far, and, if it should

habitually do so, will not be worth cultivation. The Muscat Blanc Hatif (Early White Muscat) is particularly recommended abroad.

There are five or six more kinds which will be fully proved in two or three years, but it is hardly probable there will be any thing better produced, for cultivation under glass, than the best of the old kinds named above. For large collections, almost any number of kinds may be added. The Garden of the Luxembourg, at Paris, numbers about five hundred varieties, many of them worthless, and a great number only differing very little in foliage, or in the time of ripening. The following list contains the new varieties, with some older ones, which have recently been brought to notice, part of which have not yet been proved in this country:—

ESCHOLATA MUSCAT.—This is said to be a seedling of the Muscat of Alexandria, and every way like it.

CHASSELAS MUSQUE'.—Cracks badly, thus far; has been worthless in this country; it is a seedling raised by Vibert, of France.

CANNON HALL MUSCAT.—Sets very badly; the berries are large and very handsome.

WILMOT'S EARLY WHITE MUSCAT.

BLOOM RAISIN SEEDLING.

DE CANDOLLE.—Red, with large bunches and berries.

WILMOT'S NEW BLACK HAMBURGH.—Has proved fine.

WILMOT'S No. 16.—Has proved fine.

BLUSSARD NOIR.

CHASSELAS HATIF PETIT.—Too small to be worthy of cultivation.

BLACK LOMBARDY.—A fine late grape; this is the same as West's St. Peter's.

VICTORIA HAMBURGH.—This is said to be a synonyme of the old kind; but there have been specimens exhibited which certainly appeared different.

MUSCAT OF LUNEL.—This is the same as the Muscat of Alexandria.

TOKAY, CHARLSWORTH.—Excellent, with a Muscat flavor.

WHORTLEY HALL SEEDLING.—A good, and very late grape.

RED TRAMINER.—Good, with small round berries.

RISSLING WHITE.—Ripens in the open air; the berries are small, and the flavor good.

BLACK TRIPOLI.—Has round berries, not unlike the Black Hamburgh.

BLACK PROLIFIC.—Has round berries, with large bunches. It is good, but does not keep well.

PALESTINE GRAPE.—The bunches of this variety are enormous, and the berries are oval, large, and white.

SUABI.

LIVERDEN.

FROMENTAL.

FLORENTINE.

FALANCHINA.

AUGUST MUSCAT.—A seedling raised by M. Vibert, of Angers, in France, from the grape called there the Frankantal, (*supposed to be what we call the Black Hamburgh, as it usually proves so, when ordered from France;*) it is a very weak growing vine; the fruit is

black, of Muscat flavor, and is said to mature its fruit earlier than any other grape; a vine in my grapery has fruit which will ripen this summer.

**GOLDEN CHASSELAS.**—Has a very large round berry, with a large bunch, and is very handsome; sets poorly and cracks.

**ALEPPO.**—The bunches are large; it is a good bearer, and a good grape.

**WHITE NICE.**—Has very large bunches, with small berries. The quality is good.

**ESPERIONE.**—The berries are small and black, and the bunches very large.

**ROSE, OR RED CHASSELAS.**—This is a good bearer, with a fine flavor and small berries.

**GROSSE NOIR OF LORRAINE.**

**DECON'S SUPERB.**—A white grape, fruited, in 1846, by Mr. Buist; is said to be very fine.

**PRINCE ALBERT.**—This variety will fruit this season in this country.

**QUEEN OF NICE.**—This is a handsome fruit, with large bunches and berries, but it is said to be a small bearer.

**VIOLET MUSCAT.**

**GROSSE PERLE BLANCHE.**

**XERES.**—A white grape, represented as very fine.

**BLACK MORSE.**

**PURPLE MUSCAT.**

**AUSTRIAN MUSCAT.**—Is not unlike the Grizzly; promises to be fine.

**S. CHARGES HENLING.**—A black variety, fruited by Mr. Buist, in 1846; said to be fine.

PÖRTIER NOIR.

GROS COULARD.—Has large berries and is early.

BISHOP.

ST. PETER'S OF ALIERS.—The berries are large and oval.

CAILLABEE.—Resembles the Black Frontignan.

PARTRIDGE FOOT.

GARDEN TOKAY.—Red.

HANSTERETTO.—Black; does not set well.

BLACK MUSCAT OF ALEXANDRIA.

RED CHASSELAS OF VIBERT.—This is supposed to be a hybrid of the Isabella and Chasselas.

CHAPTAL.—This is another seedling of M. Vibert, with large oval berries.

MADELAINE OF VIBERT.—Has berries of medium size and oval.

GROSSE PERLE BLANCHE DE SEMIS.—Seedling of Vibert; said to have very large bunches, and the berries uncommonly large and nearly round. Two other varieties, from seed, by M. Vibert, with black colored fruit, which he calls Nos. 3 and 4, are early; but, as he does not mention them as particularly good, it may be presumed that their quality is not remarkable.

JOSLING'S ST. ALBANS GRAPE.—A seedling, raised by Mr. Josling, of St. Albans, somewhat resembling the White Frontignan; supposed to be a hybrid of Muscat of Alexandria and White Nice. This is highly spoken of and recommended by Mr. Thompson; it is said not to shank.

LOMBARDY, RED.—This is a late grape, with very large bunches, and is the same as the flame-colored Tokay.



MACREADY'S EARLY WHITE.—This is a new variety; it has been fruited the present and last season by Messrs. Hovey & Co., in their greenhouse. It is a white grape, with an oval and rather small berry. I do not consider it any better, if as good, as the Pitmaston.

#### CULTURE IN THE OPEN AIR.

The mildew renders the cultivation of foreign varieties of the grape, in the open air, in this country, almost useless. The difficulty is not with the season; this is long enough to ripen many kinds, were it not for the above trouble. I have seen, in my garden, the Early Black July perfectly colored the first of September; but the leaf was so injured by mildew, that the grapes did not sweeten, or obtain any flavor.

In some of our cities, they occasionally ripen very well. If it is desired to make the attempt, the border should be made with care in the same way as directed for house culture; they may be trained by any of the systems described; prune them, and thin the berries in the same manner as if in the house.

The Pitmaston White Cluster, Early Black July, and Esperione are recommended as the best for cultivation in the vicinity of Boston; further south, the Black Hamburgh and Frontignans may be added to the list.

In November, the vines must be laid down and well covered with straw, or litter, to protect them from the frost.

In Hovey's Magazine of Horticulture, vol. 12th, is

a communication by Mr. J. W. Russel, gardener to Horace Gray, Esq., on the cultivation of the grape, in which he gives the following receipt to prevent mildew. Having found the application of sulphur to the floor of the house all that was necessary in cultivating the grape under glass, I have never used this preparation, but, for their cultivation in the open air, I would strongly advise its trial; it should be applied in July, or earlier, if there is any appearance of mildew on the fruit, wood, or foliage.

RECIPT.—“To one peck of quick lime, add half a pound of sulphur; put them into a tight barrel, and pour boiling hot water over them sufficient to slake all the lime, and it will be found that the sulphur is mixed with it in the best possible manner; then pour on to the top of it three gallons of soft water, and stir it well together, leaving it to settle; in about twenty-four hours, the water on the top will be perfectly clear.

“This should be taken off as clear as possible, and put into a *stone jar*, there to remain until wanted. Half a pint of this mixture will be sufficient for three gallons of water.

“This wash will not injure either the fruit or leaves, and no person could tell that any thing but clean water had been used, only that it leaves a stain on white paint, which will wear off in a little time. This is a sure remedy for the mildew, and, therefore, worth knowing to every grape cultivator.”

The Isabella, a native grape, succeeds better, in the open air, than any other variety in this vicinity; the border should be well made, and in a dry situation;

the training must be different from that of the foreign kinds; it will not bear the severe pruning which is necessary for them; the summer shoots should be tied to the trellis; leading up or out, in different directions, shoots to be partially retained, at the winter pruning, for the extension of the vine. In September, cut back the ends of all the shoots made this year to check the growth, and let the sun and air have access to the vine. Winter-prune, in February, on the spur system, leaving an addition to the extreme shoots of about two feet of the new wood, and when this cane grows too long for the trellis, cut it back, at the winter pruning, to any length desirable, and lead up a new shoot the coming season to take its place.

The quantity of fruit that a vine of this variety will ripen, when it has arrived at maturity, under proper management, and is favorably situated, is remarkably large; two bunches on a spur may be allowed to ripen; the berries do not require the thinning that foreign ones do; the small ones only should be cut out.

When gathered in perfectly dry weather, and put away in a cool place, just above the freezing point, and packed in layers of cotton, they will often keep good until March. Before packing, each bunch should be examined, and any defective berry cut out.

The Catawba will not ripen as far north as Boston.

Pond's Seedling is one of the best native varieties; the fruit, however, is but seldom seen, and it is therefore presumed to be a shy bearer.

Bland's Virginian will not ripen at the north.

Elsinburgh is too small to be worthy of cultivation.

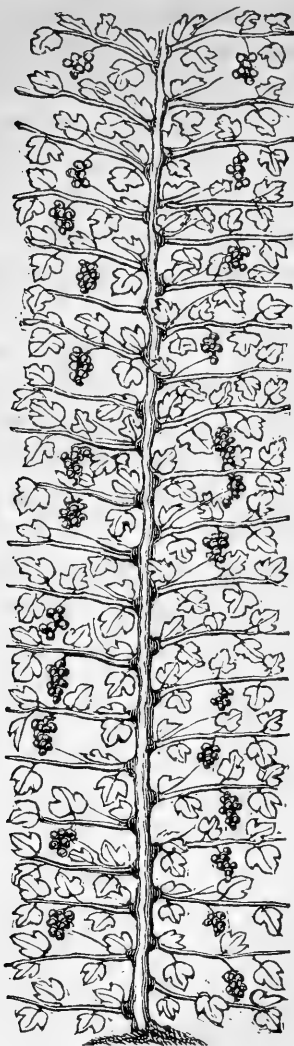
The Ohio grape is tender, and, at the north, requires the same protection as foreign kinds; the bunches are large and long, but the berries very small.

The vineyard cultivation of the native varieties of the grape, in the United States, is attracting more attention yearly. On the banks of the Ohio River, the planting is increasing rapidly, and, on the hills near Reading, Pa., are vineyards for the purpose of making wine.

At the latter place, the vines are pruned and tied to stakes, after the European method.

Dr. Underwood has a vineyard on the Hudson, where he raises large quantities of the Isabella and Catawba for the table, which are sent to the New York market for sale.

H. W. S. Cleveland, Esq., of Burlington, N. J., has a vineyard of the Isabella, and is increasing it largely.



This drawing represents a vine after it has become established, and has been planted six or more years, and has been pruned agreeably to these directions. The lateral shoots are not represented.

## DIFFERENT SYSTEMS

OF

### TRAINING AND PRUNING EXPLAINED.

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HOARE'S PLAN.—After planting, the vine must be cut back to two eyes.

The first year, if more than two shoots push, rub the others off, and train the two shoots to the trellis. As soon as it appears probable that no accident will happen to the strongest of these shoots, cut out the other; this will be about the first of July; continue to secure the shoot to the trellis, from time to time, as it grows, pruning in the laterals to one eye.

In November, cut the vine down again to two eyes.

The second year, train exactly in the same manner, and if any fruit appear, take it off.

Early in November, cut the vine down to three eyes, thus:

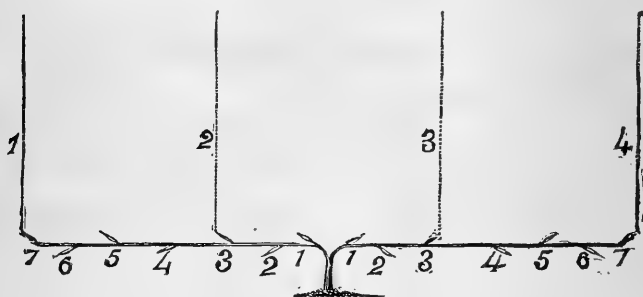


The third year, train up the three shoots, and rub out all others; in July, prune out the weakest one; stop all laterals as before; continue to train the other

two carefully during the season. About the first of September, pinch off the ends of the shoots.

In November, cut back the two shoots to seven buds each, and prune out carefully all the laterals close to the buds.

The fourth year, early in February, cut out of each shoot the first, second, fourth, fifth, and sixth buds; then bend the two shoots carefully down, and secure them in a horizontal position, thus:

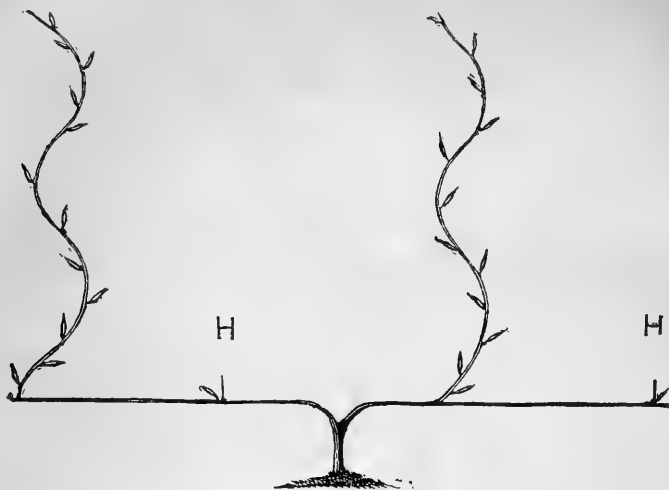


Train the shoots that push from the eyes three and seven in the manner indicated by the dotted lines, and if more fruit shows than it is proper for the vine to bear, cut it off after the berries have set; the same treatment of the vine is to be pursued during the season as last year.

In September, stop the top of the shoots.

In October, as soon as the fruit is gathered, cut back the first and third shoots to as many buds as may be deemed necessary to produce the quantity of fruit which the vine can mature the next year, and the second and fourth shoots to the lowermost bud, each; cut out the lateral shoots close to the buds.

The fifth year, train the two canes in the manner represented below,



and the two shoots, which will push from the spurs H, H, train also in the same way.

The vine has now assumed the form which it is permanently to retain, and it may be considered as the commencement of a system of alternately fruiting two shoots, and of training two, at full length, for bearing wood to fruit the following year: which method can be continued, without alteration, until the vine is able to mature more fruit, when the arms may be extended, and as many more upright or bearing canes added as are required.

This plan may do for the Isabella, or other native kinds: it might answer on the back trellis of a house, but, for the roof, it would not succeed so well, as the shoots would occupy too much space.



It is liable to the same objections that all the long cane systems of training are.

The long, or succession mode of pruning is recommended by Mr. Loudon and many others. It is thus:—

The *first year*, one shoot only is allowed to grow, which is cut down, at the autumn pruning, to the second or third eye.

The *second year*, two shoots are encouraged, the strongest of which must be stopped three or four buds beyond the middle of the roof, the weaker one after growing three or four feet.

At the fall of the leaf, the shoots are to be reduced; the main one must be pruned back to the middle of the roof, and the lower one to the third eye.

The *third year*, one leading shoot is to be trained in from each cane, and, from the main cane, fruit-bearing side shoots will be produced; one bunch only on a shoot should be retained, and the shoot stopped at one or two eyes beyond it. No side shoots should be allowed to grow from the spur or cane which was cut back, the leading shoot from which is to become a fruit-bearing cane the next year.

In November, the shoot from the end of the fruit-bearing cane must be cut at the top of the rafters, or within a foot of the top, and the shoot from the spur must be pruned back to the middle of the rafter, and all the spurs that bore the fruit must be pruned out.

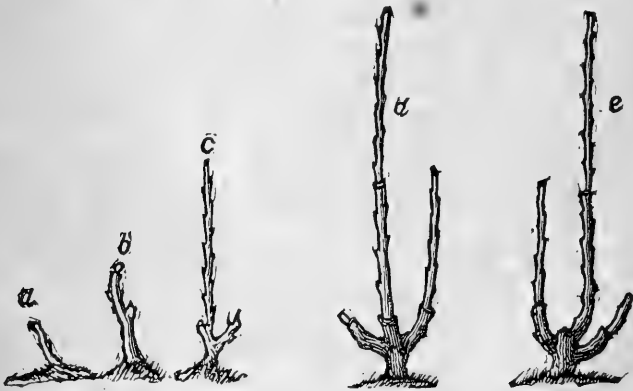
The *fourth year*, a crop will be produced, both in the upper and lower part of the house, the long cane bearing on the upper part, and the shorter on its whole

length ; a leading shoot must be trained from the short cane, and another, a new cane, from a spur below.

In pruning, at the fall of the leaf, the long cane must be taken entirely away, and replaced by the cane that bore the fruit on the lower part ; the spurs on this must be cut out, as on the cane last year, and the new cane brought up this year must be cut back to the middle of the rafters ; a spur must be left below to lead up a new cane from next year.

By this system, you have the whole length of rafters fruited by two canes, and a third one is to be growing for the next year, to supply the place of the one which is to be cut out at the fall pruning.

This is unquestionably the best system of pruning, on the long cane principle, and it is explained here by a representation of the vine in the successive years.



*a*, is the vine after planting.

*b*, is the vine cut back at the close of the first year of growth.

*c*, is the vine cut back at the close of the second year.

*d*, is the vine as it will be, after pruning, at the end of the third year.

*e*, shows the vine with the first bearing cane cut out, and pruned for fruiting the next year ; every successive year, the long shoot must be cut out, and its place supplied as above directed.

Another system, practised in this country, is, to train a new cane, every year, the whole length of the rafter, to fruit the successive season; the cane which bore the fruit being pruned back to one eye in November. This is more simple than the former plan; but an objection to this, and all other long cane-pruning and training is, that it requires the vine to produce and ripen a large crop of fruit, and a great extent of wood also, every year. The result of this plan would be, that, in a few years, the vine would evidently be less and less vigorous, and the new cane would be constantly growing smaller, until the vine would not bear any fruit, when a year of rest would be required to enable it to ripen a crop again. By this system, you can grow very large bunches of fruit; but if it is true, that large bunches are not so good as smaller ones, (which I hold to be the fact,) then there is no advantage in this. There is no difficulty in having a great abundance of fruit show itself, under any judicious pruning; the only fear is, that you will leave more on the vine than can be ripened properly, and this risk is increased by having very large bunches.

Another plan is, to have one long cane the length required, and to be spurred-pruned, as recommended as the best system of pruning, (page 20,) differing from that, however, in the cutting of the spur clean out, at the fall pruning, and not at one eye, as there directed. The reason for preferring to cut at one eye is, that, at the base or crown of the spur, are a large number of dormant eyes which will all, or a great

many of them, push when close pruning is practised ; and, where there are a great number of vines, the trouble of rubbing out these is considerable ; but when one eye on the spur pushes, it will prevent these from growing ; and if, at any time, the eye, from injury, does not push, then the dormant eyes will, and you can retain a shoot, and when this system of pruning has been carried out many years, and the spur becomes too long for convenience, or unsightly, then you can train one of the shoots that are constantly pushing on the bare wood of the spur, and prune back on that, in the autumn, to one eye.

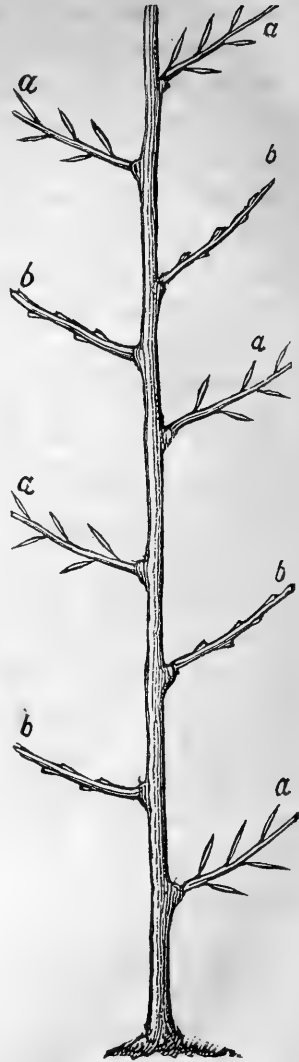
Another plan of spur-pruning, which is recommended to be practised, when the object desired is to grow large bunches, and the regularity and neatness of the vine are not considered, is to prune the shoot at any length, cutting so as to leave a full, strong eye at the end, for fruiting ; all the intervening eyes, excepting the one at the base, are to be pruned out ; this is to be grown for fruiting the next season, and is to be pruned, at the autumn trimming, at the prominent eye ; the shoot which has fruited, and all the back wood on the spur, should be cut out entirely.

Still another method of spur-pruning, when the object is large bunches, as above, is to have four or five spurs only, on each side of the cane, fruiting, each year, the alternate spur ; the cane on every other spur is to be pruned back to one eye, and the alternate cane to two or three feet, and five or six bunches al-

lowed to ripen on each; the cane which ripened the crop the first year must now, at the fall pruning, be cut back to one eye, and the cane which is to fruit the coming season should be pruned to two or three feet.

These are several of the most approved and generally adopted systems of training the grape. Whatever method is used should be persevered in for several years; constantly changing from one system to another is bad, and the result will be unsatisfactory.

If the border has been well made, and the vines have never been overcropped, and the temperature of the house, with the thinning of the berries, and summer pruning of the shoots have been properly attended to, crops of fine grapes can be had from vines pruned in any of the methods described. The plan recommended in page 20, is considered the most simple,



*a*, are the fruiting spurs.  
*b*, the spurs on which the shoots are growing for the next year.

and the one taxing the vine the least of any to ripen additional wood; it is easily kept within narrow limits, giving ample room for the light to be admitted.

In the best vineyards, where the richest wines are made, they limit the crop a plant may bear to a small number of bunches, usually from eight to twenty-five in number, and in weight to from ten to twenty pounds; in some parts of France, where they plant the vines very close, to a much smaller quantity.

At Xeres, in Spain, the sherry wine district, two or three mother branches are trained up with one spur on each to fruit, and the vines are planted five feet apart each way. The crop is limited to eight or nine bunches, weighing about fourteen or sixteen pounds.

At other vineyards in Spain, where poor wines are made, the vine is allowed to bear twenty-five or thirty pounds.

In the vicinity of Malaga, where the Muscat of Alexandria grape is grown for the purpose of making raisins, they prune close to the old wood every autumn, and the plant is kept close to the surface of the soil, which is a rotten slate; the shoots are not tied up, but hang, or lie upon the earth. The fruit also lies on the ground, and, if it were not so gravelly, it would rot; the average yield, per vine, here, is from seven to fifteen pounds; this grape makes the best, or Muscadel raisin. The grape from which the Bloom raisin is made is an inferior kind, and the grape of commerce a still more ordinary one; these are grown in the interior, and the vines are allowed to ripen from ten to twenty-five pounds.

Near Perpignan, in France, the vine is trimmed at about six inches from the ground; from the spurs, at this height, the bearing shoots proceed, and are not supported at all; the close spur-pruning is followed; from three to eight spurs are allowed on a vine, according to its age and strength.

Near Marseilles, they sometimes prune to three eyes on a spur, and each vine is allowed to bear from eight to twelve bunches, or from twelve to twenty pounds.

At the vineyards that produce the fine wine called Hermitage, the plants are only two and a half feet apart, and are two feet high, supported with stakes five feet long; only one branch is allowed to fruit, and this is pruned back to from three to eight eyes, and from eight to ten bunches is the average crop.

At the vineyards which produce the Burgundy wine, the plants are grown yet closer together. The rows of vines are only two and a half feet apart, and the plants in the rows are only twelve or fifteen inches. After the vines have been three years planted, the space between the rows is filled up with vines, making the distance between the plants only fifteen inches.

At the vineyards of Epernay and Ay, where the Champagne wine is made, the vines are, in the rows, planted as near together as six or seven inches, and the distance between the rows is only eight or nine. Of course, the vines are feeble, and produce but a small quantity of fruit each; the shoots are also very small and weak, but the vines being so close

together, the general aggregate of fruit produced is large.

At the vineyards on the banks of the Rhine, the vines are supported by stakes five or six feet long; this is the case, generally, in the vineyard culture of the grape in France. The spur-pruning is usually adopted.

In Italy, also, the same system is generally employed. By the road sides, the long cane-pruning is practised in the following manner. A vine is trained up the trunk of a tree, and, at the height of twelve or fifteen feet, a long cane of the vine is led from this tree to another and secured; these canes, hanging in festoons, present a beautiful appearance when the fruit is in perfection.

In the Azores, the vines are not supported by stakes; usually a small pile of stones encircle the plant, and the bearing shoots lay on these. The Muscats, and other choice kinds which are grown expressly for the table, are generally trained upon a trellis.

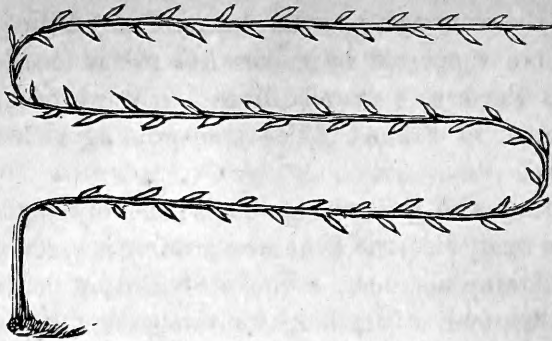
Vines, in the open air, are more free from mildew when trained quite high or very low.

In villages on the continent of Europe, it is common to see, in the principal streets, the vine trained on the houses, above the lower windows, about twelve feet from the ground; a great quantity of fruit is thus produced at little expense; the roots running under the pavement of the street.

The kinds grown are usually the small black sorts, similar to the Early Black July, and Miller's Burgundy.



The following is the manner of training.



The pruning is on the short spur system.

It should be borne in mind, that the larger the crop a vine is allowed to bear, the longer will be the time required to mature the fruit, and the quality of which will also be deteriorated in proportion to its amount.

The native varieties of the grape, when planted in a soil naturally dry and suitable, will do well without a prepared border; but, as a general rule, it must be remembered that the more care there is bestowed on the preparation of this, the greater will be the chance of success.

The Black Hamburgh grape, when well cultivated, is a richer fruit in this climate than in that of England, and it is necessary to test the quality of the foreign kinds here, as the experience of European cultivators does not always coincide with our own.



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