THE GRAPE IN OREGON.

PART I.

WESTERN OREGON.

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THE GRAPE IN OREGON.

PART I.

Western Oregon.

"In the desert it ranks next the pine."—Loudon.

The grape has been grown as a fruit for home use in this region for a period of over fifty years. The first vine planted so far as known was an Isabella, in 1848.* Yet, while the grape has been grown here over half a century, it is only within the past sixteen years that it has been considered as a commercial crop. Within this later period several small vineyards of the American type of grape have been planted, and the owners are finding them profitable investments. It is not the purpose of the writer, however, to urge the growing of the grape as a commercial crop at this time, but rather to endeavor to encourage the planting of it for home consumption. That the grape is one of the most healthful of the cultivated fruits, is attested by the fact that the consumption of this fruit has been, from Biblical times to the present, endorsed and prescribed as a dietary food by eminent physicians; the vine and its fruit have also been the recipient of zealous attention by man, and at his hands have been wonderfully developed and ameliorated. While the world at large is most familiar with the history of the European grape \((Vitis vinifera)\) the history of the development of the American grape \((Vitis labrusca, and other species)\), which is at present receiving much attention by specialists, is even more interesting to the American horticulturist than that of its old world congener, for the reason that, except for parts of California, Oregon, Washington and Idaho, and as a special type for indoor culture, the European variety is not suitable to American climatic conditions.

That the grape is highly esteemed by man is particularly evidenced by the great number of varieties that have been brought out by selection and hybridization. In 1768 Miller described eighteen varieties; in 1875, Hogg in his "Fruit Manual" listed one hundred and forty-three; in 1881, a Frenchman, M. Andre, catalogued four

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*Of the Henderson Lewelling collection brought across the plains in 1847.
hundred and seventeen. These are lists of foreign authors.* In our own country there have been listed upwards of fifteen hundred+ varieties of our native species, and the list is steadily increasing year by year. And yet with all this array of named and fully described varieties it has been found that only a few are really worthy of being planted in western Oregon for either home or market purposes. Those varieties which the experience of the past ten or twelve years, in particular, have shown to be especially suited to the conditions of western Oregon, as Concord, Worden, Moore (Moore's Early), Diamond (Moore's Diamond), Niagara, and Isabella are all varieties developed from *VitisLabrusca; † while Deleware, which also does well in many localities, is a variety of *Vitis aestivalis.§ Of the above varieties Isabella is the one planted by the pioneers and first settlers. There is scarcely a locality in which one can not find this variety growing, and among the "old homes" it is safe to say that at least ninety per cent of them have, among the plants in their fruit gardens, one or more vines of the Isabella; and though it occasionally fails to yield a full crop, often bears imperfect clusters, and is troubled with mildew, it is still highly prized by the family, especially for the making of jelly. In general it has received no more attention than the orchard trees and other fruit-bearing plants about the home grounds. A tree, fence, barn or other outbuilding too often is its support and on these it climbs and trails from year to year;|| in few instances has it received the much needed annual cutting back, and in most cases even the building of a trellis has not been sufficient to awaken the owner to the importance of liberal pruning.** With the recent planting of better varieties and the cultivation of small vineyards by men specially interested in this fruit, a very noticeable change in the appearance of the pioneer vines of Isabella has taken place.

Noting the effect of liberal pruning, proper trellising and the thinning out of surplus wood in the summer, many of the owners of old vines, some of which are reputed to have borne hundreds of pounds of fruit in favorable past years, and which formerly trailed

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*Baron, 1899.
†W.K. Newell, Oregon Report, 1899.
*Vitis labrusca, L., is the common wild fox grape of the extreme eastern United States. It is the parent of the best part of the American varieties and is well known through its offspring, Concord, Worden, Diamond, Isabella, Moore, Niagara and many others.
§Vitis aestivalis, Mich., is the Pigeon or Summer grape. Its home is the southeastern part of the country and westward to the Mississippi and Missouri. It is the parent of many of our American varieties as Eumelan, Delaware.
See "The oldest vine in Lane county."
**See "The neglected home vine."
unpruned over old buildings, fences, and trees, have removed the surplus wood, placed the vines upon suitable trellises, and are now giving them such treatment as our best growers recommend, with results that are very gratifying to themselves. Though the Isabella is no longer considered a desirable variety for table purposes by our specialists and the dealers, it is still worthy of some attention by the rural home-builder. It is especially hardy, quite vigorous and usually supplies, with a minimum amount of care, a fairly good crop of palatable fruit, more of which should be eaten by our people. It is an excellent variety for jelly-making, and grape jelly rates very high in the estimation of the American housewife; it is likewise one of the best varieties from which to make grape-must, i.e., unfermented grape juice, for which there is a steadily growing demand in one form or another.*

Though the progressive grape-grower of to-day would not recommend the planting of this variety for general home or market use, it were better that those who have vines of this variety growing on their property give them the best of care and thus obtain a quantity of fairly good fruit than to destroy them before others and better varieties have been tested and become productive. By using care it is not necessary even to destroy the root system of the old vine that has become established, but it may be grafted with a better variety, in just the same manner that one would graft a tree, with this difference: the main stem of the vine should be cut off at a point three or four inches below the surface of the ground. If the grafts are inserted at this point in the usual manner of cleft-grafting and then the soil placed back over the wound little difficulty will be experienced in transforming the head of an old Isabella or other undesirable variety into one of more favorable qualities. This work of grafting should be performed while the vine is still dormant.

SOIL AND LOCATION.

Barron,† an English authority upon the grape, writing upon this topic says: “The vine is a plant which is found growing with extraordinary vigor under very opposite conditions and in soils of absolutely different composition. The physical condition of the soil is very much more important than the elements of which it is composed.”

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*The reader interested in this product of the grape is referred to bulletin 130, California.
†Vines and Vine Culture, 1900.
Phillip Miller, an English horticultural authority, writing upon this subject in 1768 made this statement: "An ideal soil for the grape is a light, loose, brownish sand, with coarse gravel, and at a depth of twenty feet, water."*

The experience of fifty years in western Oregon has confirmed both of these views in so far as they do not conflict, i.e., as to physical conditions.

Our growers have found that the grape, at its best, delights in a deep, warm, mellow soil, but it is not unyielding in this respect, for it can be grown successfully in nearly all soils, if supplied with ample food substances, and the climatic conditions are such that the blossoms are not injured by frost in the spring or the fruit prevented by a low temperature from ripening in the fall.

As a rule the more successful growers of western Oregon find the fir hill land or the sandy, loamy river bottoms best adapted to profitable grape growing. The heavy clays of the first and second benches are so cold that the fruit develops slowly and is frequently unable to ripen before the fall frosts and wet weather seriously injure it. Vines should be planted in such places as have good air drainage, or in places that are protected against cold air currents by the presence of a considerable body of water.

While our vinyardists generally prefer a south or southwest exposure, there are profitable vineyards with western, eastern and southeastern exposure; and many small plantations for home use have no particular pronounced exposure and yet do well one year with another, when on relatively high well drained ground.

PLANTING.

The easiest and quickest way to get a vine to bearing age and size is to plant good, clean, thrifty, well rooted one year old vines. If the cost of these should deter one, then take cuttings. These can be had, generally, for the asking of any reliable grower. One point should be well watched and that is to plant only the most generally approved varieties. The home grower should not attempt to experiment with varieties in his first plantings. The first endeavor should be to secure a few bearing vines of standard varieties. The work of bringing these to fruitfulness will usually result in awakening interest in the choicer varieties, and in due time one may in-

* Dictionary of Botany.
dulge his taste for experiment by trying a few of the more promising new ones.

One step in the planting of a tree, shrub or vine that needs to be kept constantly in mind is the fact that one is planting a crop that will require years to reach its full development. Accordingly, the best of care should be given to the work of planting. A tree, shrub or vine well planted is half established. A common practice in Bavaria, when planting hops, is to thoroughly pulverize the ground to the depth of thirty to forty inches, and yet this crop is expected to remain only twelve to fourteen years, how much more thoroughly then should the soil be prepared for a crop that is to remain for a period of twenty-five to fifty years or even longer.

VARIETIES.

The first problem that confronts the one who would put out a few grape vines, is as to the varieties. This opens one of the questions upon which a very wide diversity of opinion generally prevails, but fortunately for the beginner, the consensus of opinion of our best growers upon this point, so far as western Oregon is concerned, limits the number of first choice varieties for home use to the following: Moore, Worden, Concord, Diamond, Niagara, Delaware, Isabella, Green Mountain, Brighton. In many localities the Black Hamburg does excellently, and White Chasselas, Red Burgundy, Sweetwater, Black July, Muscatel, Red Mountain, Chasselas Fountainbleu, Muscat and a few others in favored localities and under proper treatment, as in the vicinity of Forest Grove, yield very good crops of choice fruit. It is best under all conditions to consult local growers before planting. Keeping in mind that what may be best for the man who grows grapes as a business may not be the most desirable for the man who would only plant for home use.

The late A. R. Shipley, writing in 1892, said: * "For the farmer who is planting for his own use I would recommend Delaware, Concord, Hartford and Isabella, and perhaps Herbert and Worden." Since that time Worden has developed into a general favorite, while Hartford and Herbert have been eliminated from the home list.

J. H. Reese, writing the same year † named Concord, Delaware, Coloma, Eumelan, Pocklington, Salem, and Miles as varieties succeeding in the vicinity of Newberg, but in a recent letter he writes:

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* Oregon Report, 1893.
† Oregon Report, 1893.
"I hope no one has taken the above list as a guide to commercial planting. It was only recommended for home use. Nothing that we have thus far tried has been more satisfactory than Delaware and Coloma. The Concord is a most excellent variety but it is occasionally injured by early fall rains, owing to its lateness. We also find Lady a most excellent table grape but the vine lacks vigor."

August Aufranc gives as the leading varieties for his section, Salem, and as varieties for home and market uses, White Chasselas, Red Burgundy and Concord.

G. W. McReynolds, a successful grower in Lane county, finds Green Mountain and Diamond the best varieties for the higher altitudes, while Rev. D. E. Loveridge, of Eugene, finds that Worden, Concord, Delaware, Niagara, and Diamond are the best for the river bottom lands.

Quoting from some recent remarks by Mr. Loveridge, he says:

"The Catawba, a late grape, and one that is highly prized in the east, is our best keeper. It keeps until Christmas and with good care may be kept later, but it only succeeds in favorable spots. To my taste the Diamond is our best grape. When ripe it melts like a lump of sugar in the mouth and is sweet all through."

F. A. Rueter, speaking of the varieties found best for wine purposes, as grown on the hills near Forest Grove, says: "I find Sweetwater, Zinfandel, Burgundy, Black Hamburg, Muscatel, Red Mountain, Chasselas Fountainbleu, Delaware, and Muscat excellent for our purposes."

CULTIVATION.

For the first few years after the vines are put out they should receive thorough tillage. Not only should the soil be well plowed and harrowed or dug over in the spring, but it should be frequently stirred, especially during July and August. When the vines have attained the age of ten or twelve years they are quite able to get along without any especial tillage, providing rank growth of other plants is not permitted within a reasonable distance of them. In this matter, such indifferent tillage is only to be tolerated with the home vines. No commercial vineyard could be successfully managed in this manner, and while an easy slip-shod manner of tilling cannot be recommended if one would obtain the best results, it were better to have grapes on the home table, obtained from vines partially tilled, than to have no grapes at all.
The Pioneer Grape Vine of Lane County, unpruned for over twenty years.
Monarchs of over half a century.
The well kept home vines.
The neglected home vines.
A stump-trained vineyard at Forest Grove.
The pole trellis system of training.
The overhead system of training.
A fruiting Worden vine; fourth year.
A fruiting Concord vine; fourth year.
A fruiting Niagara vine; fourth year.
The one persistent feature of growing grapes is pruning. To get satisfactory results from the vine this must not be neglected in the least. There are many styles of training, each adapted to some particular conditions, but with all, liberal and effective pruning must be followed if one is to secure good returns from his plantings. The generally accepted system of training for the American varieties is the trellis, while for the European varieties the stump system is as commonly practiced. In either instance well considered methods of pruning are adopted by the most successful growers. The method of pruning will depend upon the system of training. Undoubtedly for the general home grower the trellis will be the more suitable. This method, while involving a greater original outlay, has the advantage of requiring less after-attention, an important point with the one who grows this fruit as an incidental crop. The details of pruning are fully treated in the separate articles following.

The articles by Messrs. Coolidge, Broetje and Newell have been specially prepared for this bulletin. These men have all been successful growers of the grape and give the benefits of their experience in such a way that the home-builder, and other persons interested in this fruit, may readily grasp the important and essential features of grape culture both for home and commercial purposes. The different localities represented by these writers include the principal sections of western Oregon, in which the grape may be successfully grown.

PESTS.

Like all other cultivated fruits the grape has its enemies, but thus far they cannot be considered serious drawbacks to its culture in Oregon. The powdery mildew appears in nearly every section of western Oregon one year with another, but this is no longer held to be a serious pest and only menaces the crop of the home grower, for the commercial vineyardist duly attends to the work of applying the simple remedies prescribed for this trouble.

While the flowers of sulphur is still used as a remedy against this trouble by many growers, the more progressive commercial vineyardists are recommending the Bordeaux mixture for early applications and the ammoniacal solution for the later applications. The ease with which the sulphur can be applied, and there being
no compounding necessary, it probably will continue to be used for
some time yet by the home grower in preference to the more com-
plex copper solutions. Though if one be provided with a spraying
outfit, it will no doubt be better to use the liquid preparations, since
the same solution used for mildew on the grape may be used for
various other fungous pests.

Lodeman* advises four applications: First, about a week before
the blossoms open; Second, about a week before the blossoms fall;
Third, two weeks after second application; Fourth, sometime be-
tween two and four weeks after the third application. Formulæ for
making both Bordeaux and ammoniacal solutions are to be found
in bulletin 28 of this station.

The effectiveness of the sulphur remedy depends largely upon the
temperature at the time at which the application is made. If the
weather is warm much better results are had than when rain, or
cold cloudy conditions follow. The material should be dusted over
both leaves and fruit and the first application may be made when
the mildew first appears; the second, in about two weeks, and future
applications will depend upon the climatic conditions, and the per-
sistence of the fungus.

Lately, since '98, some growers have reported the trouble known
as "rattling" or "shelling." This trouble affects the fruit in such
a way that it falls prematurely. In many instances not only is
that part of the fruit which falls lost, but the beauty of the cluster
being destroyed its market value is reduced and thereby even a
greater loss is sustained.

In 1894, Lodeman gave this subject considerable attention and in
bulletin 76 of Cornell said: "It would appear that one cause which
lies at the bottom of the trouble is defective nourishment, and all
influences which aggravate this condition may be considered as in-
direct or exciting causes." The subject needs further attention be-
fore a remedy can be proposed, as the real cause is yet to be ascertained.†

The mongolian, or Denny, pheasant is held by some growers to be
as much of a pest in the vineyard as any of the fungi or insects.
Being a shrewd bird he manages to secrete himself beneath the
foliage and eat and destroy large quantities of the fruit. The dam-
aged clusters often presenting the appearance, to the casual observer,

* Bulletin 76, Cornell.
† Professor Bailey in his "Evolution of Our Native Fruits" makes this statement in con-
nection with a discussion of Vitis labrusca. "In its wild state it is very variable in size, color and
quality of fruit, and in size of cluster. Its berries tend to fall from the stem, and the "shelling"
of grapes in vineyards may be a lingering of this ancestral trait."
of "rattles" cause much loss to the grower of fine fruit. Vigilance and a trusty shotgun would appear to be the only really efficient remedies against this foe of choice fruit.

The robin is likewise credited with doing serious injury to the grape crop, especially in the vicinity of Portland. His case is the more serious, since, in numbers, he greatly outranks the pheasant, and is generally held to be a friend rather than a foe, for the accepted reason that he destroys large numbers of injurious insects, while at the same time there is no inducement to kill him for game purposes as in the case of the pheasant.

**VARIETIES ON THE STATION GROUNDS.**

The following varieties have been growing on the station farm since 1890. The records show that in all this time, though the vines have grown vigorously, and fruited abundantly, little mature fruit has been harvested:

- Allen Hybrid, Amber Queen, August Giant, Agawam.
- Burgundy, Boz, Brighton, Black Malvoisie, Black Hamburg, Black Eagle.
- Concord Muscat, Campbell Early, Caserio Nori, Concord, Catawba, Creveilnor.
- Duchess, Delaware, Dutchfield, Don Juan.
- Eldorado, Eumelan, Excelsior, Early Victor.
- Faith.
- Gross Sapet, Gross Gilliam, Goethe, Green Mountain, Golden Pocklington, Gaertina.
- Hartford Prolific, Herbert.
- Imperial Seedling, Illinois City.
- Jewel, Jefferson.
- (Moore) Diamond, Magora, Muscat, Mamosa, Moyer.
- Nectar, Niagara, Newberg, Naomi.
- Oil noir, Oneida.
- Pocklington, Purity, Peabody, Peerless, Poughkeepsie.
- Rogers Hybrid, Royal Muscadine, Rose of Peru.
- Secretary, Seedling, Salem.
- Ulster Prolific.
- Vergennes.
- Zona.

Comparative notes on several of the American varieties have been made by Professor Coote and are herewith presented.

During the spring of 1890 about seventy varieties were planted. Owing to the poor condition of the soil, the plants made but little
growth the first two years, although they were given good attention in the way of cultivation.

In the winter of 1893 the earth was removed from around each plant for a distance of three feet, to a depth of twelve inches. These trenches were filled up with night soil at the rate of about ten gallons to the vine. After three days the earth was replaced in position, not being again disturbed until spring, when the whole was thoroughly plowed, and the surface soil kept well stirred through the summer. Through the application of the night soil the vines made a growth of fourteen to sixteen feet in 1894, and through a liberal supply of stable manure every other year the vines have made a good development. The location is not a good one, owing to the exposure, which is western and open to the cool sea breezes that spring up during the afternoon and evening. Quite a number of the varieties have never fruited. The following notes were taken during the year 1897:

Allen's Hybrid—Bunches, long, thinly set. Berry, medium, very thin skin, nearly white, being slightly tinged with amber, transparent. Matures in favorable seasons from September 20th to middle of October.

August Giant—Not of any value in this location. Has not matured any fruit during the test.

Black Eagle—Matures from September 26th to the end of October. Bunches, moderately compact and long. Berry, small, black, carries a heavy bloom. Flavor, second quality.

Brighton—A variety requiring a dry period at the time of blossoming in order to insure the setting of the berries owing to the lack of pollen. Berries, medium to large, light red, changing to dark red when fully matured. Not a desirable grape for this location.

Concord Muscat—Matures September 26th. Bunches, long, compact; berry, large, oval; skin, thin; color, a greenish white with delicate bloom; rich and sugary with a strong Muscat flavor.

Concord—An old well known grape. It has not matured well any year. Too well known to need any description.

Delaware Red—Matures September 30th. Bunches, small, compact, shouldered; berry, a little below medium, round; skin, thin; flesh, sweet and tender, rich; color, a light red. It carries a thin bloom.

Eumelan—A very dark red grape. Clusters, medium; berry, medium, covered with a heavy bloom. Matures September 10th.

Early Victor—A dark grape, cluster, medium; berry, small, good flavor, carrying a good bloom. Matures September 8th.

Eldorado—Bunches thinly set with berries above the medium; color, clear golden yellow; bloom, thin; high flavor, resembling that of a pineapple.

Gaertner—Clusters, large, moderately compact; berry, medium to large; color, light red; skin, thin; bloom, thin; flavor pleasant and sweet.
Hartford Prolific—A variety that never fails to mature, generally, from the first to the middle of September. Bunches, medium; color, black. A few days after maturity the berries begin to fall. It might be valuable for home on account of its earliness and for this only, being one of the few early black grapes.

Jewel—Clusters, small; color, dark; flavor, good; matures September 4th.

Moore Diamond—A light green grape of excellent quality; berry, large, with good heavy bloom; matures September 25th.

Niagara—Matures, last of September. Bunches, compact; berry, medium, with a thin bloom; skin, thick; color, pale green changing to a pale yellow when fully ripe; flavor, very good.

Nectar—Berry, medium to large; color, dark, covered with a heavy bloom. Matures September 2d. Fruit of fair quality.

Moyer—Clusters, small. Berries, small; color, red; of excellent quality. Matures September 3d.

Poughkeepsie—A vigorous variety, very much resembling the Delaware. Matures September 13th. Clusters thickly set with small, very sweet berries of excellent quality. Color, light red; a good second early variety.

Purity—Not of much value on account of its lateness in maturing; bunches, small and loose; color, pale red, with a thin bloom; skin, thin; flesh, coarse.

Secretary—Does not mature. Altogether too late a variety for this section. Bunches, large, moderately compact, well shouldered; berry, large; color, black, with heavy bloom. It has all the appearance of being a good grape in earlier localities.

Salem—Matures the last of September. Clusters, well shouldered. Berry, medium to large; color, pale red, changing to a deeper red in the sun.

Worden—Clusters, large, well shouldered, moderately compact. Color, black; berry, large, slightly acid; skin, thin; bloom, quite heavy. Matures September 20th.

Wyoming—Produces quite small compact clusters; berries, medium; color, red, very much resembling the Delaware, covered with a slight bloom; flesh, firm, sweet, pulpy, a little foxy.

Rogers Hybrid No. 9—Matures September 20th. Clusters, medium to large, sometimes shouldered; berry, medium; color, dark red with a heavy bloom; skin, thin; flesh, pulpy, sweet and altogether rich.

Peerless—A red grape, resembling Black Hamburg in color and shape. Matures September 18th; berries of medium size; flavor not the best. Has all the appearance of being a good grape if placed under better conditions.
The Southern Willamette Valley.*

In order to make the highest success of grape growing three essentials are to be observed: 1st, Selection of variety; 2d, Selection of location, and 3d, Proper handling of the vines while growing and bearing.

Sixteen years ago, when I moved out into the hills south of Eugene, and told some of my farmer friends that I was going to devote one of the choicest spots of my limited area to a vineyard, they tried to dissuade me, at the same time informing me that they had tried grape-growing, and that on account of the cool summers, grapes would never get sweet and only in exceptional seasons could any grapes fit for table use be raised.

The variety generally grown at that time all over the Willamette valley was an Isabella seedling, with an occasional true Isabella, usually planted in the poorest places on the farms and never pruned or cared for. My first step, after preparing a warm sunny spot on the southeast side of a hill, was to procure from a vineyardist in Napa valley, California, plants of his best early grapes of the Vinifera or foreign type, and at the same time secure from an extensive grape grower of western New York plants of his best American varieties. When the vines were three years old not one of my neighbors was so astonished at the large beautiful clusters of delicious grapes—red, white and blue—as myself, and when put on the Eugene market nine out of ten purchasers supposed they were getting California fruit.

The proper way to plant a vineyard is to have the rows run north and south, vines 8 feet apart in the rows, and rows 10 feet apart.

It has been my contention that in certain respects Oregon is the best grape country in America. In California the large foreign grapes, Chasselas, Black Malvoisie, Tokay, Muscat, Black Hamburg, and Cornichon grow to perfection, but on account of soil and climatic conditions our delicious high-flavored American varieties do not reach perfection.

In western New York and along the lake shores in Ohio the finest Worden, Concord, Niagara, Diamond and other leading American varieties reach perfection, but on account of the severity of the winters and fungoid diseases prevalent in those sections, the truly delicious foreign grapes cannot be grown. In this Oregon of ours, side by side, can we grow Worden, Concord or Niagara equal to New York, Ohio or any other state, and to my taste the most delicious of all grapes, Chasselas, Black Hamburg and Black Malvoisie of the foreign varieties. In a few seasons have I succeeded in growing truly delicious Muscats, but, as a rule, Tokay, Muscats and Cornichon do not mature. These latter are black skinned, coarse grapes at best.

* D. W. Coolidge.
At the opening the selection of variety was placed first; possibly location should have been first, as experience has taught me that the foreign varieties do not succeed so well in the valley as on a hill location. A southeast exposure, protected on the north and west by timber if possible makes an ideal location. The American varieties do equally as well on the hillside as in the valley; but, although I have taken plants of the foreign varieties from my hillside vineyard and planted them in the valley, the quality of the fruit is not nearly so good, and mildew is harder to contend with. Wherever one plants a vineyard, give it the sunniest, warmest spot you have, provided, of course, that the soil is good. While it does not agree with my own taste, the local market shows a decided preference for the American varieties, as Worden, Concord, Niagara, Diamond, Brighton, Diana, Delaware, Catawba, Agawam and Lindley, and I would plant them in the order named. There is not a more delicious American variety than the Worden which has many good points to commend it. It is the earliest American grape; berries and bunch large and of unexcelled flavor. It has some weak points too: it cracks and shells badly and takes the most delicate handling to get it upon the market in prime condition. The vine is quite vigorous but not quite so much so as the Concord or Niagara. I dislike to admit it, after what has already been said about the quality of Oregon grapes, but it is a fact, that the Concord does not attain quite the high degree of excellence that the western New York or Ohio Concord possesses, but the Worden, Niagara, and in fact all other American grapes, really seem quite the equal of the same varieties in the east. As all know, the Worden and Concord are blue grapes, while the Niagara and Diamond are white or green American varieties. The Niagara is a most vigorous growing vine, an enormous bearer and of very good quality if allowed to hang on the vines, ordinarily, until about the middle of October. Diamond is not quite up to my early expectations; the berries are not so large as Niagara, but it is somewhat earlier, and should find a place in every garden. The preference among consumers is for the blue grapes, however, and if one is planting for market he will want more of the blue varieties. The Brighton, Delaware, Diana, Lindley, Agawam and Catawba are all red grapes of truly delicious quality but the poorest sellers of the three colors. The Lindley and Agawam do not perfectly fertilize and are always borne in imperfect clusters. This is also largely true of the Brighton. The Delaware and Diana, both delicious, are too small in berry for the trade, usually. The Catawba is so late that it ripens very imperfectly. These are the best American varieties that have come under my observation; while Moore's Early, Early Ohio, Eaton, Bacchus, Hartford, Wyoming Red, Woodruff Red, Pocklington, Clinton, Wilder, Early Victor and several others that I have tried are so inferior in quality and growth of vine as to make them almost worthless.

My favorites of all grapes grown in the Willamette valley are two
foreign varieties, the Chasselas Neuschatel, a white or green grape of the sweet water type; but much superior to it in both size of fruit and flavor is the Black Malvoiseie. The former ripens very early on hill locations, usually by September 5 to 10, and the latter about the middle of October. The Malvoiseie is a large blue grape, oval shape, and borne in large clusters. As remarked before, neither one of these reach the same degree of perfection in the valley as on the hillside. Another truly delicious early foreign grape is the Violet Rose. Its name is misleading, however, as it is a white or green grape; oval shaped berry, quite large; and large bunches. One favorable season Violet Rose was picked and the fruit was quite sweet on the 15th of August. It is a grape I obtained of James Varney, late State Inspector of Fruit Pests. This last variety has one serious drawback—it fruits very sparingly, even when an unusual number of buds is left. Black July and Black Catawba will both ripen in ordinary seasons, but they are not desirable in all particulars. It is only an occasional season that Muscat, Tokay or grapes of that class will ripen perfectly in the Willamette valley. I have experimented with many other varieties but have found none worth one's time except the above favorably mentioned ones.

Although one may have the choicest varieties planted in a most favorable location, yet if he fail to properly prune his vines the result will be far from satisfactory. Foreign and American varieties must be pruned radically different to obtain the best results. The foreign varieties should be stumped or trained low, while the American should be trained to a trellis. Both should receive the same treatment the first year, being cut down to about three buds, which are all allowed to start, and when the growth is 4 or 5 inches long all but one sprout should be rubbed or cut off and only the one allowed to grow the first season. If American varieties are planted and the vines have made three or four feet growth, erect a good substantial trellis by planting good cedar posts 16 feet apart in the row; brace the end posts well, and stretch a lower wire, about 18 inches above the ground, tightly on the posts; cut the vine so that it will reach about 2 inches above the wire; tie it securely to the wire as nearly perpendicular as possible. The second year allow only two buds to grow, training them horizontally to the lower wire.

The following spring cut these two arms back to about 3 buds each. At this time stretch the upper wire to the trellis, about 4 feet from the ground. Train the strongest growth straight up to the wire, and one of the strongest growths of the side arms to the wire, allowing the other two buds to grow. The following season leave the two side arms 3 or 4 feet long, cut the two other limbs back to 2 buds, and cut the upright growth about 2 inches above the wire. The renewal plan of pruning seems to give the best results. This consists in cutting out the old wood each year and training the last year's growth to the trellis. After the third year train side arms on the upper wire as well as the lower.
The foreign grapes need very different pruning. The first year the vine is treated just the same as the American varieties. At the end of the first season's growth plant a substantial stake and cut the vine to a height of 18 inches and tie securely to the stake. The second season allow only 3 buds to grow. The following fall cut the three limbs back to two buds each. Ever after that cut back to one or two buds, and when the vine gets too thick cut out some of the old wood. After the vine is three or four years old it will have formed a substantial stump that will stand alone and the stakes can be removed.

In February, if the weather be good, after the pruning is done, spray the vines thoroughly with a strong Bordeaux mixture. Repeat the spraying with a weaker solution when the grapes are half grown. This is sufficient for American varieties. The foreign sorts will need to have a liberal application of flour of sulphur, about the first of August. This can be sprinkled on the vines by hand, taking care to get the sulphur all over and around the vine. The amateur grower will have to learn by experience whether or not another application of sulphur is needed. He will soon learn to know the first appearance of mildew on the vine or grapes. Right then is the time to begin sulphuring.
The Lower Willamette Valley—East.

When I first came to Portland, I was told, upon inquiry, that grapes could not be grown here and that many unsuccessful efforts had been made. Having brought plants of a few varieties with me from Illinois, I planted them at Mount Tabor, together with other varieties that were obtained here. Some of the varieties proved to be quite a success. With the success of this small planting in view others became interested in the growing of good grapes, and as it had been demonstrated that only our native American grapes could be grown successfully here, I sent east for plants of over thirty varieties, only such as ripen before or with the Concord. With these plants a small vineyard was started near Milwaukie, Clackamas county, in the spring of 1891. Of these varieties some proved to be a decided success, while others were practically failures. Some of these latter varieties ripen from the first to the middle of September while the Concord, Niagara and others ripen about the first of October. This vineyard has been visited by hundreds of people who have expressed astonishment at seeing the vines laden with large perfect clusters of fruit—equal to that grown anywhere in the Middle States. There has not been a failure yet. The vines are strong and healthy, free from mildew or other disease, and free from insect pests, while plants of foreign varieties grown nearby have been entirely ruined by mildew.

In 1898 we began marketing the fruit the first week in September and ended the middle of November. The first part of the crop was sold at wholesale, price, four cents per pound; the remainder, for three cents per pound; none was sold for less, though grapes sold by others for less than these prices. The fruit of our American varieties grown here is much preferred by the people of Portland to that which comes from other sections of the country.

All the varieties of our American type of grapes have come originally from the wild grapes that grow abundantly throughout the middle, northern and southern states, and they are generally divided into four distinct classes.

First. The Northern Fox Grape class, *Vitis labrusca*. It is the varieties of this class upon which the growers of this valley must chiefly rely. To this class belong the Isabella, Catawba, Concord, Worden, Moore's Early, Eaton, Niagara, Green Mountain, Brighton, Vergennes, Lady Washington, and a great many others.

Second. The Summer Grape class, *Vitis aestivalis*. Only a few of this class are good for the table, but they are valuable for wine. I have only one variety of this class, the Centennial; a dull yellowish white grape; a good bearer; bunches of good size; berries somewhat below medium but sweet and delicious. Though it ripens with the Concord, it can be kept until the new year.

*J. F. Broetje.*

†Moore—American Pomological Society nomenclature.
Third. The Riverside Grape class, *Vitis riparia*. I have a few varieties of this class. The Empire State, a white grape that bears well; bunches, long; berry, medium, very sweet. The Elvira, another white grape; wonderfully productive; bunches rather small, good for wine making. Then there are many hybrids among the various classes, some of which are very fine, as the Salem, Lindley, Agawam, Wilder and many others, but these are not so reliable and saleable as the Concord and the Niagara.

Fourth. The Southern Fox Grape class, *Vitis vulpina*. None of this class can be successfully grown in our climate. Throughout our valley one sees on the sides of buildings, and in gardens many grapevines that always look sick and gray with mildew, except where they are sprayed and sulphured several times during summer. These are the varieties that are grown in California. They are of the foreign type, *Vitis vinifera*, and were originally brought from Europe. They cannot be recommended for planting in this part of the state. I have met many people, who have never thought about the different classes of grapes; their origin, habit and properties, hence this brief outline of the types and classes of the grape. According to my experience, at present, planters in the lower Willamette district, must rely mostly on varieties of the Labrusca class, and only those that have been successfully grown will be named here.

The Concord.* This is the grape for everybody, large strong-shouldered bunches of big, black, sweet berries of the fine native flavor that all Americans like so well. It is very productive and always a sure bearer. Seven year old vines have borne more than thirty pounds each.

The Worden.* A black grape like the Concord; bunches large and heavy; berries larger than the Concord and rather better in quality; ripens about ten days before the Concord and is fully as productive.

The Niagara.* A white grape that bears well and regularly; bunches, very large and heavy; berries, sweet and of good flavor. This variety is gaining much in favor on the home market. It ripens about ten days before the Concord. It is the best of the white grapes.

Moore's Early.† A black grape; bunch medium; berry, very large, quality as good as Concord, but vine not quite so productive. Very valuable here on account of its earliness. It ripens nearly three weeks before the Concord.

Eaton. A very strong grower; bunch, very large and heavy; berries, very large, many an inch in diameter, black and of good quality. It sells well, but will not bear long shipment very well.

Moore's Diamond.† A very good white grape; ripens about two weeks before the Concord. Bunch and berry, large and of best quality; not so productive as the Niagara.

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* See plate. † Moore, † Diamond—American Pomological Society nomenclature.
Green Mountain. A white grape. Rank grower; bears well; bunch, long; berry, medium, very sweet and delicious. It ripens here about the first of September.

Vergennes. A red grape of good quality; bears well and is a good keeper. Bunch and berry, large.

Brighton. A red grape of very best quality. Bunch large; berry, medium, very sweet and fine; keeps well. Ripens the same time as Concord.

Lady Washington. A beautiful large white grape, bears well, but in quality not as good as Niagara.

Wyoming Red. A very handsome grape. Bunch and berry medium of bright red color, sweet with strong native aroma. Ripens two weeks before the Concord. The blossoms do not fertilize well every year, and for this reason it is not a reliable bearer.

Delaware. Though not belonging to this class, it is so well known and succeeds so thoroughly under our conditions that I cannot pass it unnoticed. Bunch and berry, small, light red, very sweet and of most delicious flavor. It is an abundant bearer.

The above varieties have been found to be the best and most profitable for our home market, and they are sufficiently hardy and prolific to be all that the grower can desire of them.

HOW TO PLANT.

The vines should be planted in rows seven feet apart, and eight feet apart in the row. After the ground is well prepared and rows staked off, holes are dug about one and a half to two feet deep and three feet across. These holes are partly filled up again with top soil, in such manner that it forms a little hill in the center of the hole, then the roots of the vine are spread around on this, care being taken to have the vine in the center. After the vine is planted a stake should be driven beside it. During the summer clean and thorough cultivation should be given.

PRUNING AND TRAINING.

In the fall or winter following the first season's growth, all shoots are cut away except one, the strongest. This is cut back from two to four buds. The next summer the strongest shoots should be tied to the stake; the others should be cut away clean. The second winter cut away again all shoots, leaving only one, the strongest. This is cut off at a height of two feet above the ground more or less, according to its strength and size, and tied to a stake or wire, if wires have been stretched. The best and cheapest material for tying the canes to the wires is the shoots of the golden willow. All shoots that issue within a foot to a foot and a half of the ground, should be pinched off as they appear, in order to have a single straight stem and the canes thus be kept a sufficient distance above the ground. It is necessary to have the canes well up from the ground
in order that the air may circulate freely underneath, and this also makes cultivation much easier. Of the shoots that come at the upper end of the cane,* leave three or four. These may be fastened, as soon as long enough, to the upper wire. They must not be checked in their growth. During the third winter two of the strongest canes are cut back, leaving four to seven buds on each, and tied to the upper wire, the other canes are cut back to two buds, these are intended to make bearing canes for the year after. If the vines are rather weak, the canes should be pruned shorter and tied to the lower wire.

In the spring of the third year, after the vines have been plowed and hoed, the young shoots will push out vigorously. Now come the most important and delicate operations to be performed, in the pruning of the vine. This is known as summer pruning, and is usually done with thumb and finger. The work should be commenced when the young shoots are about five or six inches long. One shoot of the spurs † and one shoot at the lower end of the canes must not be touched, because they are wanted for bearing canes next year, all the rest are pinched off at the ends, leaving one leaf above the upper bunch. All the shoots that issue between the spurs and canes, and also all that issue on the stem below, must be rubbed off. Some buds occasionally produce two or three shoots; rub off all but the strongest. Usually the grape will bear three bunches on each shoot. Now suppose a vine was pruned to two canes with seven buds each, and two spurs with two buds each, would make eighteen shoots; and, should each shoot bear three bunches there would be fifty-four bunches in all; this would be too much for one vine except it were very old and strong; therefore, the smallest and poorest bunches are pinched off, leaving only the largest and best. A vine in its third year should not be allowed to bear more than fifteen pounds. If some shoots have not sufficiently developed to be pinched, pass them by and go over the vines again a few days later. This early pinching of the young shoots tends to throw all the vigor of the vine into the development of the fruit clusters and leaves. This early pinching saves much of the strength and vigor of the vine, for otherwise the shoots grow long and hard, and the operation of pruning is more difficult. This operation of pinching the shoots and thinning the fruit results in a larger quantity and better quality of fruit. After blossoming, and the laterals or side shoots have come out from the axils of the leaves, the plants are again gone over and these pinched, leaving one leaf. If the last named laterals shoot out again they should be likewise pinched, leaving one leaf. After this last pinching little growth will be made. The shoots which are left untouched in the operation of pinching and which are designed to bear fruit next season, may be cut off at the ends some time during July or August. It must be

*A cane is a growth of the previous year.
†A spur is a short branch of the original stem, two or more years old.
kept in mind that the fruit should grow and ripen in the shade, and that it is the leaves that feed the fruit and the plant, and that the roots only furnish the water and some mineral matter. Many persons make a mistake in pulling away all the laterals besides many leaves in order, as they believe, that the strength of the vine may be forced into the fruit, and that the rays of the sun may shine on the bunches, and thus help to develop them.

The fourth year. At this age the vines are large and strong enough to bear a full crop. The pruning is the same as that of the third year, but instead of leaving two canes and two spurs, there may now be left three or four canes and as many spurs. Consider the strength of the vine and prune accordingly, longer or shorter, from six to ten buds to a cane. Vines that show lack of vigor may be pruned as in the third year. Care, however, should be taken not to overtax the vines, as they are apt to overbear and lose their vigor. Should the soil be rather poor and the vines look weak, use some stimulants, as potash or bonedust. Never use ordinary stable manure. Soils that produce profitable crops of wheat or potatoes are rich enough for grapes. Grapevines that have been bearing for eight years at Milwaukie have never tasted any fertilizer yet, and the vines are increasing in vigor every year.

THE TRELLIS.

Our grapes are all grown on wire trellis. Strong posts are set firmly into the ground, at the ends of the rows, and well braced. Holes are bored through the end posts two feet above the ground; through these the first wires will be fastened: two feet above the first set of holes bore another set for the top wire. The wires are then stretched tight and fastened at both ends. Then good strong stakes, seven or eight feet long, pointed at one end, are driven firmly into the ground between the vines in the rows. Commencing with the first stake in the center, between the first and second vine, the next stake comes between the second and third, and so on through the row. Place the stakes edgewise, so that a sharp corner faces the wire, then saw a notch about three-fourths of an inch deep, slanting downward for the wire to rest in. These notches must correspond in height with the holes in the end posts. Some use staples to fasten the wires.
No longer ago than 1898 it was a customary practice for the fruit dealers of Portland to import every fall a few cars of New York grapes. Happily this practice is no longer necessary. A few men have grown grapes in Oregon for many years and with such success that the culture of this fruit is now becoming general; with a full crop this year (1901), we will have grapes for export. Puget Sound and British Columbia still import eastern grapes, thus it is seen that there is a nearby market for us to supply. It is quite probable also, that a considerable trade can be developed in California for our Concord grapes, as this variety is not grown there, nor is there any other variety that will take its place.

In planting a vineyard give first attention to selecting a suitable location. Most any of the hill lands of western Oregon that have a southern or southwestern exposure and that are sufficiently high to be free from late spring or early autumn frosts, will do. Elevations between 200 and 1000 feet are best, though lower land near the Willamette river is just as good. A very necessary point to keep in mind when making a selection is that the site shall be such that the cold air can settle to the ravine or valley below; this is a great protection against frost, and also, such land is usually naturally well drained. If the drainage is not naturally good then tile it; for a good friable soil is a necessity in grape culture. Should one have no other suitable place, then plant a few vines against the south side of a building or tight board fence.

PREPARATION AND PLANTING.

For the grape nothing is better than new land or clover sod; plow deeply; harrow thoroughly; then dig holes for each vine, twenty-four to thirty inches in diameter and sixteen to twenty inches deep, putting the surface soil and sod back into the bottom of the hole. Vines should be planted in rows seven or eight feet apart, and eight or ten feet apart in the row. This will require 600 to 800 vines per acre.

The best time for planting is in April, and one year old vines are to be preferred. When planting trim off all ragged or broken roots and cut back long ones one-half to two-thirds, and cut back the stem to two buds. Plant deeply, working fine surface soil carefully about the roots then tread thoroughly with the feet until the hole is nearly full, and finish by spreading the earth from the bottom of the hole loosely over the top. When planted set a strong four-foot stake an inch or so from the stem; always on the same side of the row so that they will not bother when cultivating.

Cultivate thoroughly from early spring until August 1st to 10th. Cultivation after this latter date tends to prevent the proper ripening of the wood. The tools needed are a one-horse plow, a cultivator and a hoe.

PRUNING AND TRAINING.

The pruning the first year is plain sailing but after that it becomes more difficult, and the beginner should, if possible, visit some experienced grower and see how it is done for it is very difficult to write directions sufficiently clear.

*W. K. Newell.
for a new hand to follow. As soon as the two buds left at the time of planting, get long enough, tie the strongest one to the stake and rub off the other. Keep the new shoot tied carefully to the stake as it grows and rub off all laterals as fast as they appear. There are many ways of training the vine, but the fan shape on a wire trellis is my preference. If this method is adopted then the second spring the first season’s growth must be cut back to twelve or fifteen inches from the ground, leaving the two top buds to grow, and rubbing off all other shoots and suckers as fast as they appear. Treat these two shoots just the same as the one of the first season.

The third spring build trellis. Use heavy cedar posts well braced at the ends and light posts every sixteen feet apart along the row. No. 12 galvanized wire, one twenty-four inches from the ground, the other fifty-two or forty-four inches should be stretched tight on the posts. Then cut back the two canes of the second season’s growth to three or four buds each and tie to the lower wire, still keeping the main stem tied to the stake until strong enough to stand alone. Let two shoots grow from each branch of the vine, tying them to the wires as they grow out; when five or six feet long pinch off the ends. These should bear a few grapes, and will furnish the bearing wood for the next season. The fourth season four or five new shoots may be started for the fifth season’s fruit, when the fourth season’s canes are removed. This process is repeated each year, remembering, always, that the fruit is produced only on the new wood of the previous season.

February is the best time for winter pruning; do not prune old wood after sap starts in spring. Summer pruning consists of rubbing off all suckers and superfluous buds and pinching back the shoots at the proper time. The shoots for next season’s fruit should be pinched when they have attained a growth of five or six feet, and the bearing shoots (when the fruit has set) should have one leaf left beyond the farthest bunch of fruit. If the vine is setting too much fruit remove some of it. If one does not wish to trellis just keep the main stem tied to the stake and headed down to twenty-eight or thirty inches, allowing bearing shoots to issue directly from it, and heading these shoots back every year to two buds.

The expense of starting a vineyard is large; and is itemized about as follows: Land $50.00 per acre; good, deep plowing, $2.50; harrowing, $1.00; digging holes, $15.00; stakes, $8.00; planting, $12.00; vines, $40.50; cultivating, first season, eight times, $8.00; hoeing, $3.00; tying and pinching laterals, $4.00; total for first season, $143.50 per acre. The second year, winter pruning, $2.50; cultivating, etc., for season, $20.00. The third year the trellis will cost $50.00, pruning, etc., $25.00, bringing total cost to $241.00. The vineyard should pay its own way after the third year, and be in full bearing by eight or nine years, when it should produce five tons or more of fruit per acre each year.

WHAT TO PLANT.

Among the best of the varieties that have been thoroughly tested in Oregon, are Concord, Worden, Moore, and Eaton for black grapes; Niagara, Dianoud, and Green Mountain for white grapes, and Delaware and Brighton for red grapes. All of these varieties will yield well and ripen perfectly in a favorable season, and cannot fail to give satisfaction, except that Worden will be found too soft for shipment. Do not attempt to grow such varieties as Black Hamburg, Sweetwater, or Muscat; they are not well adapted to this climate.

* I.e. on shoots which issue from canes of the previous year.
† This is the so-called "stump" system of pruning as practiced in California and also in southern Oregon and at Forest Grove.