by fermentation, alcohol is formed in the juice, and which is therefore thrown down and separated from the wine forming the "tartar"—depends the superiority and greater healthfulness of true wine over the fermented liquors of other pulpy fruits, whether indigenous or exotic.

In the pulpy fruits used in the manufacture of domestic wines the acids present are chiefly malic and citric, which form with potash salts soluble not only in the fresh juice but also in the fermented wine. They are consequently not thrown down or separated out of the wine as alcoholization goes on in the fermenting vats, and their presence in the wine renders the latter unhealthy, it being liable to become acid in the stomach, and to produce derangement of function in that organ. Hence, the real superiority of the wine of the grape above the fermented juices of other fruits depends not upon fancy, nor an uneducated taste, but upon the production of an alcoholic liquid not containing within it substances injurious to digestion.

Tartaric acid is as essential as sugar in the manufacture of wine; in dry wines the tartar predominates much more than in sweet, in which sugar is the dominant element. This acid diminishes as the fruit approaches ripeness; and it is also diminished in grapes grown where the climate is hot and dry in the season when the fruit is ripening. In the south of Europe, when, in the autumn, the African winds blow northward, when the grape is ripening, those portions of the Mediterranean shores exposed to a hot and dry wind do not produce dry wines, but wines that are always sweet, because the proportion of sugar and tartar are out of relation with each other. Thus the rich, sweet grape of Malaga has but little tartaric acid, and a sweet wine is the result, while the wine of Burgundy has more tartar and less sugar, and produces a more acid wine.

To determine the presence and proportion of tartaric acid, I selected the Catawba grape as that most abundantly grown for wine purposes, and, by the kindness of Mr. Michael Werk, of Greene county, Ohio, who placed at my service several pounds of ripe grapes, and a sample of the tartar produced, I have been enabled to furnish the following results:

Six pounds of grapes, pressed, yielded 56 ounces of a literally clear, colorless juice of specific gravity 1.074. This juice was diluted with an equal amount of distilled water, and the mixed liquid passed through a fine strainer to separate the cellulose and albuminous matters not dissolved; solution of chloride of calcium with ammonia was added so long as a precipitate was produced, allowing the liquor to rest between the additions; the precipitate was then dissolved in hydrochloric acid, and ammonia added. The precipitate was then collected and dried at a gentle heat, and weighed against a tared filter. By this process the malic acid present is avoided, and the precipitate obtained is either wholly tartrate of lime, or, if not containing any racemic acid present in the juice, forming a racemate of lime. As racemic acid is only a modified form of tartaric acid, and as it is not known to act in any way differently in wines from its congener, it was not deemed necessary to separate them in this examination.

The amount of tartrate of lime attained from six pounds of grapes, or from $4\frac{2}{3}$ pints of juice, was $4\frac{32}{100}$ grammes, (nearly 67 grains,) which represents $50\frac{16}{100}$ grains of acid, tartrate of potash, originally existing in the juice.

This would give the quantity of cream of tartar present in each ounce of juice as nearly one grain, admitting the whole of the tartaric acid to be combined with potassa, but as there is always some tartrate of lime present in the juice, the amount of cream of tartar is slightly lessened.

The quantity of sugar determined by Fehling's modification of the copper grape-sugar test was 19.6 per cent.

As the grapes examined had ripened very much in the interval between the gathering and the examination, the above proportion of tartrate of potass is probably somewhat less than existed in the fruit. The presence of that amount shows satisfactorily, however, that tartaric acid is the dominating acid in the Catawba grape, and that is produced abundantly in the latitude of Cincinnati.

The sample of crude tartar forwarded by Mr. Werk yielded, on qualitative analysis, acid tartrate of potass, tartrate of lime, sulphate of potass, sulphate of lime, phosphate ammonia, and magnesia. The two last-mentioned salts were present in but small amount.

Mr. Payen, having stated in his work on distillation that the cellular tissue of the pulp contained "tannin," led to a repeated examination of the juice of the pulp; and in every case where common care was taken that the skins should not be pressed, so that any of its liquids might become mingled with those of the pulp, not a trace of tannic acid could be detected, thus verifying Mulder's statement that this acid is wholly confined to the skins.

THE NATIVE GRAPES OF PENNSYLVANIA, NEW JERSEY, NEW YORK, AND NEW ENGLAND.

THEIR WINE-PRODUCING QUALITIES.

BY JOHN F. WEBER, OF WASHINGTON, D. C.

My examination of native grapes began at Orange and the surrounding country, in New Jersey. Some varieties, which I had noticed several years before, first attracted my attention. I found them still vigorous in their natural growth, and capable of improvement. Following a northern direction, I traversed the greater part of the State of Connecticut, meeting, in the township of Canton, with valuable kinds, free from insects. In western Massachusetts, especially in East Hampton, Northampton, Florence, and Leeds, I observed a few varieties well worthy of attention, exhibiting, with regard to the formation of wood and fruit, all the qualities sought in good wine. Such was also the case south and north of Boston. I selected samples of the matured fruit of all those probably most capable of improvement, and transmitted them to Dr. Jackson, of Boston, for chemical analysis.

The value of grapes, either for wine-making or table use, being de-

termined by the amount of saccharine matter contained, it is important to know to what species a promising new variety may belong.

From the great difference existing between a table grape and a wine grape, it becomes necessary that, wherever the manufacture of wine is the object, the former should be altogether ignored, its sweet, yet watery, juice producing but a weak wine.

Though the wine grape has also, and should have, a sweet taste, it is a different one from that of the table grape, as it is vinous instead of watery, and piquant instead of flat, attributable to the amount of sugar and acids being well proportioned.

Actuated by this fundamental view, I designated the following varieties for chemical analysis, desiring to improve them thoroughly and systematically:

No. 1. *Vitis vinifera.*—A grape extensively grown in the vicinity of Paris, for the market and wine-making; introduced eight years ago, and cultivated with entire success, by John Charles Savalle, near Orange, New Jersey. It seems to be perfectly acclimatized. Its character and habitus consist in the following points: a healthy, vigorous growth; short-jointed light-brown wood; medium sized, roundish leaves, of dark-green color and a bluish tinge, a fine down on the upper part, soft and fine nerves; bunches and berries medium sized, well set, compact, and well shouldered; of a fine dark-blue color; ripens toward the end of September, and, according to the statement of Mr. Savalle, a fortnight earlier than in Paris. It is a regular bearer, and in every respect a first class grape-vine. The soil where it grows is not favorable to its full development, being sandy and wet, yet porous enough to prevent water from stagnating. A location on the south side of a house would be more suitable. Mr. Savalle takes down this vine every winter, wraps it in straw, lays it flat on the ground, and covers it with a board, on which are placed stones of sufficient weight to keep it in that position.

This is the whole secret of success with foreign grapes. Tender and highly improved as they are, they cannot bear our severe winter. In central Germany, northern France, and the greater part of Hungary, the custom is to lay down the grape-vines before the winter sets in, and protect them from the attacks of high winds and piercing cold, otherwise they would there be winter-killed as well as here.

No. 2. *Vitis labrusca.*—A blue wild native grape-vine, found in the woods near Haydenville, Hampshire county, Massachusetts, and transplanted on the south side of his dwelling-house, by James R. Salomon, of Leeds, near Florence, Massachusetts. Its habitus resembles much that of the Isabella. The wood is, however, of a darker shade, short-jointed, and of healthy growth; leaves rather large, heart-shaped, and of a light-green color, downy on the lower part; bunches contain from ten to twenty-five berries, large and oval shaped; thin skin and juicy, sweet pulp; ripens about the 15th of September; a good regular bearer. The soil in which it grows is a sandy loam, rather wet, the situation open to the east and south, but well protected from north and west winds by a chain of mountains. This vine would improve by propagation, and may be rendered a desirable table and market grape, profitable to its cultivator.

No. 3. *Vitis labrusca.*—A blue wild native grape-vine, probably a seedling of an old vine standing near by; very prolific and luxuriant growth; stands at the foot of a hill, well protected from the north and west, but open to the east and south; in a wet, sandy soil, on the farm of Solomon Phelps, near Florence, Massachusetts. I have known this grape seven years, and always considered it possessed of good points and qualities worthy of propagation. The wood is dark-brown, long-jointed; leaves of medium size, heart-shaped, dark-yellow down on the lower side, and of a pale yellowish-green on the upper, nerves fine; bunches contain from fifteen to twenty-five large round berries, of an agreeable wine taste; ripens by the end of September. It deserves improving, and will be a desirable acquisition for the vineyard. The late frosts in June destroyed most of the fruit in this section, which, in favorable seasons, abounds in luscious grapes of all colors and sizes.

No. 4. *Vitis cordifolia.*—A blue wild native grape, standing on a sandy plain, northwest of Mount Tom, on the farm of William Knüpfer, of East Hampton, Massachusetts. Wood light-brown, short-jointed, not so vigorous, but healthy growth; leaf medium size, heart-shaped, with fine nerves, yellowish-green on the upper side and bright-yellow on the lower; clusters compact, with twenty to twenty-five round, medium-sized berries, of a juicy, agreeable wine taste; ripens toward the end of September. A good grape for red wine, or claret.

No. 5. *Vitis labrusca.* Crystal grape.—A white wild native grape, was found in a swamp on the farm of Salomon D. Case, Canton Center, Hartford county, Connecticut, and transplanted by Mr. Case on an open field, or rather side-hill, facing southeast, well sheltered from the north and northwest wind. He has propagated considerably from this vine, by making layers, of which many are already bearing. The wine has a pleasant taste, much like the genuine Madeira, and needs no sugar. The soil is gravelly loam, rather strong, but contains valuable mineral substances, and is well adapted for the grape. The vine is of a healthy, vigorous habit, ripens wood and fruit well, and is a regular bearer. Wood brown, short-jointed; leaf medium, heart-shaped, strong nerves, of a yellowish-green on the upper side and light-yellow on the lower; clusters medium size; berries large, round, flat on both ends, of a green color, with snowy-white specks; ripens about the fifteenth of September; sweet and juicy. See analysis and report of Dr. Jackson, page 49.

No. 6. *Vitis labrusca.*—A blue wild native grape. Wood reddish-brown, short-jointed, of a healthy growth; leaf small, heart-shaped, strong nerves, yellowish-green on the upper and dark-yellow on the lower side; clusters, or bunches, large; berries large, round, and flat, very sweet; ripens middle of September. Soil the same as above; location open and level. See analysis, page 51.

No. 7. *Vitis cordifolia.*—A black wild native grape; very old vine, standing on the same farm, in a wet, stony soil, surrounded by wood. Wood dark-brown, short-jointed, and of healthy growth; leaf medium size, heart-shaped, tender nerves, light-yellow on both sides; bunches large, of a fine form; berries large, round, of an agreeable wine taste,

best quality; will make a good claret; ripens in the beginning of September. See analysis, page 50.

No. 8. *Vitis cordifolia.*—A blue wild native grape, on the same farm; grows on a dry, stony soil, in an open, level situation. Wood dark-brown, short-jointed, and of vigorous growth; leaf medium size, heart-shaped, fine nerves, yellowish-green on the upper and light-yellow on the lower side; bunches large; berries round, and flat on both ends, rather large, of a pleasant wine taste; juice dark-colored; makes a good claret wine; ripens middle of September. See analysis, page 50.

No. 9. *Vitis labrusca.*—A red wild native grape; grows in a swamp on clay subsoil, among brushes, likewise on Mr. Case's farm. Wood light-brown, short-jointed, and healthy growth; leaf small, round, and strong nerves, yellowish green on the upper, and bright yellow on the lower side; bunches compact; berries round, medium size; very sweet; ripens middle of September; a good table grape.

No. 10. *Vitis labrusca.*—A purple grape, with copper-colored specks; wild native; grows in the same situation and soil as the preceding. Wood light-brown, short-jointed, and robust growth; leaf medium size, round, strong nerves, yellowish green on the upper, and yellow on the lower side; bunches medium; berries round; sweet, juicy, and spicy taste; will make a good schiller wine; ripens middle of September. See analysis, page 49.

No. 11. *Vitis cordifolia.*—A red wild native grape, standing on the same soil and location as the preceding. Wood light-brown, short-jointed, and strong growth; leaf medium size, round, with fine, tender nerves, light-yellow on the upper, and yellow on the lower side; bunches medium size; berries large, oval, sweet, and spicy; a good table and wine grape; ripens middle of September. See analysis, page 50.

No. 12. *Vitis labrusca.* Sugar grape.—A white wild native grape, stands on an elevation, a quarter of a mile from the sea-coast, Rocky Hill, and four miles north of Plymouth, Massachusetts, on an old pasture, overrun with briars, belonging to Mrs. Mental Peirce. Soil dry, sandy gravel. Wood brown, short-jointed, of healthy but moderate growth; leaf medium, heart-shaped, strong nerves, yellowish-green on the upper, and dark yellow on the lower side; bunches and berries of medium size, round and flat; very sweet; ripens by the end of September; good table grape.

No. 13. *Vitis cordifolia.*—A mahogany-colored wild native grape, stands on a dry, strong soil, on an old wood lot, in a free, high situation, belonging to James Merrick, South Scituate, Massachusetts. Wood red-brown, short-jointed, and vigorous growth; leaf medium, round, ribs and nerves fine, and of a bright reddish color; bunches medium; berries, ditto, round, and of agreeable wine taste; ripens middle of September.

No. 14. *Vitis cordifolia.*—A white, grey-spotted, wild native grape, resembles much the German Gutedel, or French Chasselas; stands near the preceding. Wood gray, short-jointed, and tender growth; leaf small, heart-shaped, with fine nerves, of light yellowish-green color; bunches long and loose; berries medium size, and oval; ripens the

end of September. The fruit was destroyed by a sharp frost about the middle of September. I am of opinion that this grape is a seedling of the above-named Gutedel, and got there by some accident; but it may be the product of a hybrid from white and colored grapes growing there; it certainly has more the character of a *vitis vinifera.*

No. 15. *Vitis cordifolia.*—Bartlett grape. A pale-red or pink-colored grape; was found in the woods near Lexington, Massachusetts, by Elias Phiney, some years ago, and transplanted by Francis Alger, 34 South street, South Boston, into his garden; the soil is a sandy clay, location warm, and well sheltered by a tight board-fence. Wood reddish-brown, short-jointed, and of a robust growth; leaf medium size, heart-shaped, fine nerves, light yellowish-green color on both sides; bunches rather large, compact; berries round, medium, and sweet; ripens late; requires a warmer climate. See analysis.

No. 16 *Vitis cordifolia.*—An amber, or rather Traminer-colored wild native grape; seedling; has got by accident into the garden of Hon. Marshall P. Wilder, Dorchester, Massachusetts. Soil dry, gravelly loam; situation warm and sheltered. Wood light-brown, short-jointed, healthy growth; leaf medium size, heart-shaped, strong nerves, yellowish-green on both sides; clusters and berries of medium size, round and sweet; ripens middle of September. Not fruit enough for an analysis.

No. 17. *Vitis labrusca.*—A red-brown, mahogany-colored, wild native grape, originated in the woods, and was transplanted, three years ago, into the garden of G. W. Clark, Malden, Massachusetts. Soil stony clay; situation level and sheltered. Wood red-brown, short-jointed, vigorous growth; leaf medium size, round, strong nerves, and yellowish-green color; bunches medium; berries round and full; ripens middle of September; a good table grape. See analysis, page 46.

No. 18. *Vitis cordifolia.*—A Traminer-colored seedling grape, perhaps recently out of the woods; stands in Mr. Wilder's garden. Soil and location like No. 16. Wood red-brown, very short-jointed, healthy growth; leaf medium size, heart-shaped, fine nerves, and yellowish-green color; bunches medium; berries round; sweet and agreeable taste; ripens middle of September. See analysis, page 45.

No. 19. *Vitis æstivalis*—Sweet-water.—A white propagated grape, cultivated eighteen years by Mr. Newell Harding, 38 Chamber street, Boston, in his garden, a warm, well-sheltered situation. Wood golden-yellow, short-jointed, very healthy, vigorous growth; leaf small, heart-shaped, three-lobed, fine tender nerves, green on both sides; bunches large, compact, well shouldered; berries medium, round, very juicy and sweet; ripens middle of September, bears regularly every year. This grape is very profitable for table and market, and in a good sheltered position, with proper management, it will thrive anywhere. It requires to be laid down during winter, to be protected from severely cold weather. See analysis, page 47.

No. 20. *Vitis labrusca.*—A dark-brown wild native grape, from the woods, transplanted twelve years ago by John Butterfield, Bedford, Massachusetts, on the south side of his house; soil dry gravelly loam; situation sheltered and level. Wood brown, short-jointed, vigorous growth; leaf medium, heart-shaped, strong nerves, yellowish-green

on the upper, and yellow on the lower side; bunches large; berries round, large, and sweet; ripens by the end of September; a good and regular bearer. See analysis, page 47.

No. 21. *Vitis æstivalis.*—A red-brown, mahogany-colored wild native grapes grows in an open field belonging to John Wilson, Bedford, Massachusetts, running up on trees; soil sandy gravel. Wood brown, rather long-jointed, healthy growth; leaf round, small fine nerves; bunches medium size, compact; berries round, medium size, and of an agreeable wine taste; regular bearer; ripens by the end of September. See analysis, page 48.

No. 22. *Vitis labrusca*, the original Concord grape, a seedling from the *Vitis labrusca.*—This vine is now fifteen years old, and has borne regularly for seven years. It is one of the best hardy American varieties, ripening its delicious fruit in the most northern part of our country. It will improve its qualities every degree further south, wherever cultivated; in the South, West, and even in California, it gives general satisfaction. The wine, in body, flavor, and taste, resembles the sherry wine. The owner and propagator, Hon. E. W. Bull, of Concord, Massachusetts, deserves much credit for the introduction of this highly valuable grape. Its character consists of the following points: Wood brown, medium-jointed, very healthy, vigorous growth; ripens its wood well; leaf large, heart-shaped, three-lobed, strong nerves, yellowish-green on both sides; bunches large, well shouldered, rather loose; berries over medium size, oval, of a dark-blue color, thin skin, juicy, and of an agreeable wine taste; good for the table and wine making; it ripens about the middle of September; a good regular bearer; soil dry sandy loam; location open to the south, and sheltered from the north and northwest by a hill. See analysis, page 47.

No. 23. *Vitis labrusca.*—A seedling from the third generation from the original Concord vine. Soil and location the same as above. Wood light-brown, long-jointed, vigorous growth; leaf medium size, heart-shaped, strong nerves, three-lobed, and green on both sides; bunches well shouldered, medium size; berries medium, dark-blue, juicy, and very sweet; a good wine and table grape; ripens middle of September. See analysis, page 47.

No. 24. *Vitis labrusca.*—A seedling of the second generation from the original Concord vine. Soil and location as stated above. Wood red-brown, long-jointed, healthy moderate growth; leaf medium size, heart-shaped, three-lobed, strong nerves, yellowish-green on both sides; bunches well shouldered, a little above medium size; berries the same, round, dark blue, sweet, and juicy; good wine and table grape, ripens with the other two. See analysis, page 47.

No. 25. *Vitis labrusca.*—Sage grape, a red-brown wild native grape, found in the woods some years ago by Mr. Sage, and transplanted by Mr. R. W. Emerson, of Concord, Massachusetts, on the south side of his house. Soil dry sandy loam. Wood red-brown, long-jointed, healthy but moderate growth; leaf medium size, round, strong nerves, yellowish-green on both sides; bunches medium; berries of uncommonly large size, three berries weighing an ounce; round and tolerably sweet; ripens early in September. See analysis, page 48.

No. 26. *Vitis labrusca.* Dracut Amber.—A reddish-brown wild native grape, a seedling from this family, found in the woods, and transplanted by Asa Clement, in Dracutt, near Lowell, Massachusetts, in his nursery. Soil a heavy wet clay; situation too much shaded and obstructed by trees. Wood red-brown, short-jointed, and healthy growth; leaf medium, heart-shaped, strong nerves; bunches rather large, compact; berries large, round, and sweet; ripens middle of September. See analysis, page 48.

No. 27. *Vitis cordifolia.*—A dark-blue wild native grape; grows in a swamp, owned by Salomon D. Case, Canton Centre, Connecticut. Soil, wet clay; situation much shaded by young forest trees. Wood dark-brown, medium-jointed, healthy, but moderate growth; leaf small, heart-shaped, fine nerves, yellowish-green on both sides; bunches not above medium, compact; berries round, medium size, thin skin, pretty sweet; ripens toward the end of September. See analysis page 50.

No. 28. *Vitis cordifolia punctata.*—A blue, copper-red speckled wild native grape; grows in the same swamp; situation the same as above stated, wet and shaded. Wood red-brown, short-jointed, healthy growth; leaf medium size, heart-shaped, fine nerves, yellowish-green on both sides; bunches medium, berries ditto, oval, and strong wine taste; ripens in the beginning of October. See analysis, page 52.

No. 29. *Vitis cordifolia punctata.*—A light-red colored wild native grape, speckled with copper-red. Soil and situation like the preceding. Proprietor, Mr. Case, of Canton Centre. Wood brown, very short-jointed, vigorous growth; leaf medium size, heart-shaped, fine nerves, yellowish-green on both sides; clusters large and compact; berries rather large, oval, sweet and juicy; ripens in the beginning of October. See analysis, page 52.

No. 30. *Vitis æstivalis punctata.*—A green wild native grape, dotted all over with snow-white specks, standing on Mr. Case's property. Soil and situation the same as No. 29. Wood brown, short-jointed, a good healthy growth; leaf large, heart-shaped, strong nerves, yellowish-green on both sides; bunches and berries medium size, the latter oval, sweet, and of an agreeable taste; ripens by the end of September. See analysis, page 52.

No. 31. *Vitis labrusca*, Hartford Prolific.—A dark-blue cultivated grape, a seedling from the Isabella. This is one of the earliest varieties, and therefore exceedingly well adapted to a northern climate; it ripens in favorable localities by the end of August; a good regular bearer. Wood brown, short-jointed, vigorous growth; leaf medium, heart-shaped, strong nerves, green on the upper and whitish-green on the lower side; bunches above medium size, compact; berries medium, round, and very sweet. I obtained a sample from E. W. Whiting, nurseryman, Hartford, Connecticut, who propagates largely from that grape for sale. See analysis, page 51.

No. 32. *Vitis cordifolia punctata.*—A dark blue, nearly black, wild native grape, speckled with copper-red; grows in the woods, in a valley near a small river, on the land owned by John Warner, near Florence, Massachusetts. Soil, sandy gravel, containing some loam. Wood light brown, short-jointed, and rather slender growth; leaf small, heart-shaped, tender nerves, yellowish-green on both sides; bunches medium; berries, large, oval, sweet, and vinous; ripens by the end of September. See analysis, page 52.

No. 33. *Vitis labrusca.*—A red Traminer-colored wild native grape, an old vigorous vine; stands in the garden of Theodore Clark, near East Hampton, Massachusetts, west of Mount Tom, on a level, open situation. Soil deep, sandy loam. Wood brown, short-jointed, of moderate growth; leaf medium size, heart-shaped, fine nerves, yellowish-green on both sides; bunches and berries of medium size, the latter round, and of a pleasant wine taste; ripens middle of September. See analysis, page 52.

No. 34. *Vitis cordifolia.*—A dark-blue, almost black, wild native grape; grows on the western slope of Mount Tom, on a wet, cold, clayey soil, and runs along a fence, and on trees and brushes. The land belongs to Frank Clark, near East Hampton, Massachusetts. Wood dark-brown, short-jointed, of healthy, but moderate growth; leaf small, heart-shaped, fine nerves, green on both sides; clusters of medium size, very compact, a little shouldered; berries small, round, and of an agreeable vinous taste, slightly acid, but not unpleasant; ripens in the early part of October. See analysis, page 52.

No. 35. *Vitis sinuata.*—A dark-blue wild native grape, one of the best specimens of the frost grape; grows near the one just described. Wood brown, very short-jointed, tough, vigorous growth; leaf small, heart-shaped, three-lobed, green on both sides; bunches long, compact; berries small, round, if not compressed, rather crisp, or acid, but not disagreeable; ripens in the beginning of October. This grape deserves propagating and improving, as its juice contains properties desirable to be mixed in small quantities with other varieties in making wine, obviating flatness, and rendering it tenable.

No. 36. *Vitis labrusca.*—A red-brown wild native grape, found in the woods, and transplanted, or set out, by Mr. Clark, in his garden, southwest of Round Hill. Soil, a good sandy loam; situation, warm and well-sheltered; grows up on an apple tree. Wood brown, medium-jointed, vigorous growth; leaf medium size, heart-shaped, strong nerves, yellowish-green on both sides; bunches and berries of medium size, oval, and pretty sweet; ripens towards the end of September. See analysis, page 52.

No. 37. *Vitis cordifolia.*—A dark-blue, nearly black, wild native grape; stands on the edge of a forest, in a swamp meadow, at the top of the Orange mountains. Proprietor, A. O. Moore, Orange, New Jersey. Soil, wet clay. Wood dark-brown, short-jointed, thrifty growth; leaf medium size, heart-shaped, strong nerves, yellowish-green on both sides; bunches medium size, shouldered; berries rather below medium, oval, and of an agreeable wine taste; ripens the first part of October.

No. 38. *Vitis labrusca.*—A dark-blue, wild native grape, found in the woods, and set out by Charles Dickinson, of Verona, Essex county, New Jersey, on the southeast side of his house. An old vine: no care is taken of it; is supported by a rough frame. Wood greyish-brown, short-jointed, healthy, vigorous growth; leaf medium size, heart-shaped, strong nerves, yellowish-green on both sides; bunches medium, berries large, round, sweet, and pleasant wine taste; ripens in the beginning of October. Soil wet clay and very stony; situation high and open, on the top of the Orange mountain.

I have been particular, in noting these varieties, to describe their character as clearly as possible with regard to their wood, growth, fruit, and its shape, color, and taste. I did not find much difficulty, but have been often at a loss how to make out the leaves, which were often of different shapes and colors on one and the same vine; for instance, there were on a vine large heart-shaped leaves, deeply cut, with three to five lobes, long stem, stout ribs and nerves; and, again, leaves almost square, lobes hardly discernible, short stems, small, tender ribs and nerves; and some round, without lobes, long stems, fine ribs and nerves; some on one side, heart-shaped, with one or two pretty sharp cut lobes, and, on the other side, round and smooth. The same variation I found in the color of the leaf, but here it was merely the influence of the light, sun, and shade. In shaded localities, under trees, &c., where the sun and light were obstructed, the color would be a bright green, as it appears on the best improved European varieties. According to circumstances, as they were under this influence, they would change their colors, and the more favorable their situation in this respect, their color would change to yellow, and, in free, open situations, would be for the most part a yellowish green on the upper side, and several shades deeper, sometimes clear, bright yellow, on the lower side, which is in most cases their fixed color. But there are some exceptions again: The most of the worthless offsprings from the *Vitis cordifolia* have clear, green leaves, while the better varieties have that yellow hue. There is only one family of which the leaf is found invariably green; it is the lowest and least useful of all—the frost grape, or *vitis sinuata*. On some of the seedlings from the fox grape, *vitis labrusca*, the white color predominates, instead of yellow; the upper part of the leaf will be of a white hue, while the lower side presents this peculiar downy character, completely white.

According to my instructions, to investigate and examine the wild native grapes with a view of testing their respective qualities, and to note those which show good qualities for wine or table grapes, in order that they might be propagated and improved, and as those which I marked will, in proportion as they are submitted to a systematical course of development, change their original nature and habitus, so the proper time to record their character will be when they shall have attained the highest point of improvement, therefore, I concluded not to take notice of the numerous variations in the form or construction of the leaf, and difference of their colors, but only to describe their most common forms, namely, round, heart-shaped, large, medium size, or small, and the color, yellowish, whitish, or green.

The quality of their fruit, as exhibited by analyzing samples, is, in all cases, capable of improvement, the degree of which will be in proportion to the advancement of the vine itself; therefore, the analysis shows only the fundamental properties of these specimens, and the task to develop and progress upon this basis is reserved for the practical propagator and œnolog. He will arrange these varieties to answer his own purposes; by a thorough system of rational culture, increase their saccharine properties, restrict the predominance of acidity, and bring the whole to a proper condition.

By due consideration of the soil, position, and climate, a good esti-

mate will be obtained, from the result of the analysis, as to the capability of the wine. For instance, the fruit of a vine which grows on a wet, cold soil, in a low, shaded situation, and in a severe and rough climate, contains eight per cent. of sugar, the vine thus possessing the points required of a good grape; yet, in most cases, by being translated to a better soil, position, &c., with proper culture, it will attain from twelve to sixteen per cent., and, of course, produce a superior wine. Analysis, therefore, gives a surer basis to judge and select wild grapes than the simple taste, which is as various as deceptive; at the same time, it will bring to notice such varieties as, differing from the common and fashionable sweet grapes, contain precisely the properties essential to make several of the most highly esteemed wines.

Late frosts in the spring, and especially some sharp visitations in June, checked the grape-vines, and totally destroyed those on level parts of the country; only in elevated, sheltered portions was there any saved, and far less than the usual crops. My investigation was, therefore, limited to such favored locations, while even here the means allowed were not sufficient to enable me to extend my labors to a larger scale. The result is highly valuable and stimulating for the culture of the grape. I found, in general, a lively interest among all classes for this noble and lucrative branch of horticulture. The intention of the Patent Office to encourage the culture of the vine through the whole country, by collecting and disseminating knowledge relating to it, and the best methods of wine-making, was well appreciated, and especially so on account of the direct way which had been chosen. Personal observation and instruction will often, in one hour, be more beneficial than long study of scientific essays, which are, for the most part, written in too high a style to be clearly understood by the plain, practical man. By those interested in this pursuit earnest wishes were expressed that the Patent Office might continue its noble efforts.

In a country like ours, blessed with everything to make life pleasant, and possessing a proper soil and climate for every plant, why, otherwise so favored, should man be deprived of the real essence of life, wine? True, this incomparable nectar is not unknown here, for many thousand American eagles of gold cross the Atlantic annually to bring it to us; but this privilege is attainable only by a few, while the mass of the people may not receive this best gift of Nature. Substitutes have been invented, but they are poor indeed, compared to genuine wine, which makes man social, contented, and happy, while those mixtures and drugs, at once exciting and stupifying, demoralize him. As wine is a pure beverage which Nature furnishes, its use should be attainable by every one; while it inspirits the youth to all that is fair, good, moral, and grand, it stimulates the man in his labor and occupations, makes him a brave husband, father, and citizen, and brightens the evening of age. As wine has so beneficial an influence on the nature and character of the individual, it will likewise exalt the condition of a whole people; consequently, there is reason why we should exert ourselves to introduce the general culture of the grape in our own country, as has been done for centuries in other lands.

For the use and comfort of a single family, a small piece of ground, by intelligent management, will produce sufficient, while if the area be extended, the profits obtained will prove a liberal encouragement. Many hundred acres, exhausted by our bad management, but yet containing enough mineral substances to support the grape-vine, might, with little expense, be converted into vineyards. Those black and barren hills, gloomy as they look, will, in many instances, afford desirable situations for this purpose, and can thus be changed to profitable plantations, highly ornamental to the country. By a proper selection of the position and of the varieties adapted to the climate, the grape-vine may be successfully cultivated in every State of the Union. It will flourish wherever corn will grow. But before embarking in this enterprise, it is necessary to understand the principles of the culture and management of the grape, and the mode of making wine.

CULTURE AND MANAGEMENT OF THE GRAPE, AND THE MODE OF MAKING WINE.

BY JOHN F. WEBER, of WASHINGTON, DISTRICT OF COLUMBIA.

PROPAGATION OF THE GRAPE, BY LAYERS, CUTTINGS, EYES, AND SEED.

Layers.—Supposing the vines are old, and growing wild in the woods or fences, the best branches should be selected, those which have made strong and well-matured wood. They must be bent down to find where the last year's growth reaches the ground, in order to see what space they require; the length and number of the shoots will give the best indication. The land should be cleared of stones, stumps, sod, and roots, trenched to the depth of from fifteen to eighteen inches, and enriched with well-rotted compost. Heavy and stiff soil needs to be meliorated with sand, to the texture of good garden earth, after which small trenches have to be dug for each single shoot, about a foot wide and six inches deep. The branch is now taken down and secured to the ground by a strong wooden peg with a hook. It is not necessary that the branch should be prostrated quite to its root, but precaution must be taken not to break it by bending. The shoots of the last year's growth are then taken and deposited singly, each in a trench, fastened by little wooden pegs, care being used that they lay close at the ground. These shoots must have been previously examined, all dry and immature wood cut off, and only the sound, well-ripened wood employed. The best time for that operation is when the buds have made two leaves. They are left in this position, uncovered, till the eyes have attained three or four inches growth, when a regular circulation of the sap will