

applied to the stigma at the same time, the pollen of the other variety will be chosen, its own rejected, and the seeds will be crosses or hybrids. In artificial hybridizing it is quite useless to cut away stamens on varieties where they are short and reflexed. Thus we learn that Nature abhors in-and-in breeding even in plants.

"Nearly all varieties of *labrusca* in cultivation, and a goodly part of those of *vinifera*, have erect stamens; hence I conclude that these species generally, both in bearing and sterile plants, have erect stamens, though actual observation in wild nature would be necessary to establish the point. The important truth remains that, if only one variety is planted in a vineyard, it must have erect stamens, in order to make a crop.

"As to the stamen characteristics in *californica*, *arizonica*, *palmata*, *coriacea*, and *rotundifolia* species, I have not yet observed.

"Norton's Virginia and some known hybrids between *estivalis* and *cinerea* have erect stamens; hence the conclusion that erect stamens in bearing vines are partly the result of hybridization. Why *labrusca* in its pure-bloods has erect stamens in bearing vines, and continuous tendrils, while no other pure species have these, only the hidden work of past cycles of evolution can explain.

"On this subject of far-reaching importance, I trust you will see the great value of a correct table, such as is attempted here, so far as the tests and notes have been made. Though I believe myself the first who has ever compiled and made known such a table, yet I hope it may not stop here, but be added to, till it shall become a manual with every grape-grower, as it almost necessarily must with every successful originator.

"In this table you will find the common and botanical name, origin, growth, hardiness North and South, readiness with which the cuttings root, time of leaving out, blooming, kind of stamens, diseases affecting, and description of fruit, with time of ripening of a large number of different varieties of our American species of grapes, and some foreigners. So you will find, when you come to study this table in the society's printed report, that I have treated upon our grapes at a far greater extent than it is proper to read here, though in the conciseness of tabulation.

#### "EFFECTS OF CROSSING AND HYBRIDIZING FURTHER CONSIDERED.

"This is a subject within itself worthy of a book. Permit me to present a few facts more, and I am done.

"1. In growing thousands of seedlings, the hybrids have almost invariably shown greater vigour the first two or three years than pure-bloods.

"2. Many of the hybrids sicken and remain puny, much more so than pure-bloods.

"3. Some of the hybrids continue permanently very vigorous. Well-known examples of permanently vigorous hybrids are found in Warren (the original vine still standing in Warren County, Georgia, hale and bright, with a circumference of over thirty-three inches near the ground), Herbemont, Louisiana, Taylor, Elvira, a few of Rogers's hybrids, with some other *labrusca* and *vinifera* hybrids; Norton's Virginia is a remarkable instance, Jaeger's *estivalis* and *rupestris* hybrid 'No. 70,' and many more of purely American parentage.

"4. Many of the pure-bloods, weak or slow at first, become permanently vigorous, especially so if crossed with other varieties of same species.

"5. Seedlings of varieties having reflexed stamens, and which were chiefly crosses or hybrids through this circumstance, are generally very vigorous, and remain so."

By reference to Munson's table, the Government will see what vines strike from cuttings and what would require to be imported as rooted vines. I am informed that Messrs. Bush and Son and Meissner are the most reliable people to deal with for American vines. Their address is Bushberg, Jefferson County, Missouri. Colonel C. F. Clayton, editor of the *Wine and Grape Grower*, and Secretary of the National Viticultural Convention, of 24, Park Place, New York, will act as agent for the Government, if required, in selecting vines and supervising their shipment. Professor Hilgard, of the Agricultural College of the University of California, at Berkeley, will also assist Government, if required, in seeing that every precaution is taken with shipment to prevent the introduction of disease.

It is hardly necessary for me to dwell on the importance of the subject. Grape-culture is one of the most profitable of all pursuits; it settles a large population on the land in prosperity; it increases the national wealth; it makes a nation a producer instead of an importer of one of the largest products of human consumption; it tends to make a nation temperate in the consumption of alcohol. An acre of vines will produce from 500 to 5,000 gallons of wine, according to location, soil, age of vines, &c. The wine is worth in America from 2s. to 3s. a gallon. Figured out at that price, it will be seen that grape-culture will pay better than any other industry for which the land can be used. Land that now lies waste and idle may, in the future, be found of great value for viticultural purposes.

There can be no doubt whatever of the suitability of the American vines to our climate. We have already here, as I have said before, the Isabella vine, and it does remarkably well—nothing could possibly do better—and it has proved itself proof against the oidium mildew. No better instance of that could be desired than is to be found in the nursery of Mr. McDonald, at Newmarket, Auckland. He has an Isabella growing there in the most luxuriant manner, and alongside of it is a Sweetwater vine (a *vinifera* or European vine) which every year is smothered with mildew; yet the Isabella is never affected, and bears heavy crops annually. But the Isabella is by no means one of the best varieties of American grapes—in fact, in America is discarded for better and finer varieties; I could only learn of one man growing the Isabella, and he did so only on a small scale, for the purpose of blending this grape with others to get a particular flavour in his wine. It is the other and better varieties we want here, and it remains for Government to introduce them, to make the necessary experiments in different localities and in various soils, to demonstrate what varieties are the most suitable, &c. I now leave the matter in the hands of your Department of Agriculture.