

total, 500 francs. Or about five francs per are. By adding to these expenses the ordinary ones, it will be seen at a glance whether the yield of our vines is adequate to cover them.

Is it necessary to manure vines that have been treated by insecticides? The vine attacked by the phylloxera grows feeble and becomes diseased, and it is highly necessary to strengthen it by manures in which potash predominates, azote and phosphoric acid in the proportion of 2 and 3 per cent, sulphate of iron or green copperas about 5 per cent. As a potassic and phosphoric manure, cinders of Isle of Ré sea weed may be used in doses of 200 grammes per stock. Soot has also a good effect. Stassfurt salts, in which chloruret of potash predominates, may (in doses of from one to two hundred grammes) be placed around the foot of the stock to help the formation of the new roots. In this way insecticides and manures should go side by side, if it is sought to obtain a satisfactory result.

Have endeavors to fight the phylloxera by means of insecticides and manures been made to some extent in this department? Upon the Plaud-Chermignac property, about 6 kilometers from Saintes, there is a vineyard some 30 hectares and 50 ares in area, which for six years has been overrun by the phylloxera. The soil is very varied, in some places the calcareous and the plastic, clayey soils lie side by side, and it is very easy to observe the diverse results obtained according to the nature and depth of the different soils. All the patches of vines, without exception, have been attacked by the phylloxera, and have been treated with sulphuret of carbon and sulpho-carbonate of potash. In comparing the vines that have undergone treatment with the neighbors' vines that have remained without treatment, one cannot help seeing the good results of the use of insecticides in conjunction with manures.

Is not submersion a certain means of destroying the phylloxera? Submersion of the stocks for forty days is unquestionably a certain means of destroying nearly all the phylloxera on a vine. But to adopt this method the land must be low, pervious on top, impervious beneath, and located in the vicinity of water. In our climate, where in low lands vines very easily freeze, great care is taken not to plant them there, and consequently submersion can seldom be resorted to hereabouts. It should also be noticed that as soon as a proprietor submerges a vine he moistens the soil of his neighbor, who, in case he wants no water, has a right to complain, and may bring suit, as is at present the case near Libourne. Submersion, moreover, under very favorable circumstances involves an expense of about 150 francs per hectare. It should not be forgotten that to this expense, annually repeated, must be added the cost of manures, which are in such a case indispensable, as the soil is infused with lye by the use of the water.

Since French vines do not withstand the phylloxera's attacks, would it not be possible by sowing to obtain some new species that resist better, or to graft French cuttings upon French wild vines? All attempts of this character, made and repeated at various points, have caused nothing but disappointment and deception.

It appearing that the methods of fighting the phylloxera by insecticides, manures, and submersion are not attended with profit in this locality, except in case of vines planted in soil of considerable depth, can there not be found in the resistance offered the phylloxera by certain American stocks a more economical way to the preservation of our own? And, to begin with, is the resistance of these American stocks real? For fourteen or fifteen years past, in the Departments of Gard and Gironde, the stock called the "Jacquez" has resisted very well, in the midst of the phylloxera's ravages, and given good yields long after the native stocks have succumbed. The "Herbemont," the "Cunningham," the "Taylor," the "York Madeira," and the "Vitis Solonis," after being planted six or seven years in the very focus of the phylloxera's attacks, are resisting, and show a very handsome growth, while the other stocks have succumbed.

Will this resistance be permanent? A resistance which in the case of the "Jacquez" has existed for fifteen years, in the case of the others for six or seven years, and which has always existed in America, offers almost indisputable assurance for the future, and no argument or facts why it should prove otherwise can be discovered.

Is the "Clinton," which is quite widely planted, worthy of recommendation? When planted in rich, fresh soil it sustains itself passably well; but deprived of these conditions it does not resist the phylloxera. It gives, too, a poor wine, with a foxy taste. This stock has been abandoned by all good wine growers.

How is the resistance of American stocks explained? The fiber of American resisting roots is, according to M. Foex, much denser and closer than that of our European vines, and turns into wood (lignifies) much more quickly. So that in the American roots the phylloxera's puncture only attacks the outer bark, upon which it produces little excrescences which fall off like warts. In the case of French roots its puncture causes decay. Some stocks, such as the "Jacquez" especially, the "Herbemont," and the "Cunningham," can be planted and will yield wine without being grafted. They possess a resisting power equal to every test. The "Jacquez," when cultivated in this locality, blooms and ripens at the same time with the wild grape; it produces a good red wine of a very dark color, and is highly valued by the trade. It is not difficult of cultivation as regards choice of soil. Its grapes, when ripe, keep for a long time without decaying. Up to the present time it is a stock against which

nothing can be said. The "Herbemont" yields a fine red wine, not very dark in color. It blooms six or seven days later than the "Jacquez," and at the same time with the "Balzar;" we shall know this year whether it ripens in this climate, which, however, is probable. It would be a very good vine to plant in our dry, calcareous, and stony soils, in which it flourishes and grows extremely vigorous. The "Cunningham" produces at once, and quite a good wine, something like Madeira. In 1878 it bloomed in this locality ten or eleven days later than the "Jacquez." We shall not be decided until the fall as to its period of maturity. Other American stocks yielding wine at once are under trial.

Is there not some difficulty about the "Jacquez," the "Herbemont," and the "Cunningham" taking root? In 1877, in this locality, the "Jacquez" and the "Herbemont," being placed in nursery and in fresh soil, yielded a return of 70 per cent. The "Cunningham" yielded less. The "Riparia," the "Wild Cordifolia," the "Taylor," the "York Madeira," and the "Vitis Solonis" have great powers of resistance to the phylloxera, but yield so little wine that they should be used only to bear graftings from French stocks. They have the advantage of taking root very easily.

What is the best method for grafting French vines on the American ones? Joining a French and American slip, by means of the "English graft," and placing them in the nursery for the winter and spring. In the following year those that have been successful are carefully taken up and set out, either with slats or in pots. Another good way is this. The American cuttings, after having been put in the nursery in winter or spring, are taken up, the French slips are then grafted upon them (by the English plan), and they are then set out. Success in this way is almost certain. A third way consists in planting the American slips permanently in the vineyard, and then, in the second year, grafting the native cuttings upon them, whether by slitting or by the English plan.

Is there not some danger that French stocks grafted upon American ones will yield an inferior quality of wine? Experience has already pronounced in favor of French fruit trees and vines; and the wines coming from French stocks grafted upon American ones are absolutely the same as if they had not been grafted.

What, in short, is the best course to follow when a vineyard is attacked? If the vineyard is on surface soil, and the spots on the vines not very numerous, try to oppose the phylloxera in favorable weather by sulphuret of carbon or sulpho carbonate of potash, so as at least to retard its inroads and damages. If the vineyard is on deep, moist, and compact soil, struggle perseveringly and incessantly. The outlay will be repaid with interest; for those who are able to preserve their vines longest may be sure of being largely remunerated for their advances and labor. On surface as well as on deep soil do not hesitate to establish at once nurseries of American resisting vines, whether for the purpose of producing wine from them at once or for use in bearing grafts of French stocks.

What should be done in a section not yet overrun? Manure the vines and cultivate them carefully; and if there is any ground not in use sow the grape stones of American stocks, so as to be ready to start a second vineyard, and thereby not be taken unawares. In sowing grape stones there is absolutely no risk whatever of introducing the phylloxera, while, on the other hand, it would be extremely imprudent to introduce into any non-infected section in this locality, either American or French stocks coming from regions already infected.

NEW BUBBLE BLOWER.

The accompanying engraving represents a simple device for blowing and holding soap bubbles, recently patented by



GREENWALT'S BUBBLE BLOWER.

Mr. Daniel Greenwalt, of Millersville, Pa. It consists of a hollow standard supporting a small bowl for holding the

soap solution at the top, and having a flexible rubber tube provided with a mouth piece at the bottom. The bowl being filled with the soap solution a small bubble is formed over the end of tubular standard that projects above the bowl by placing over it the end of the curved tube, shown on the table, and then removing it. The bubble is then enlarged by blowing through the flexible tube.

This apparatus is not only of interest as a toy for children, but it is also of value in physical experiments.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although only approximate, they will enable the ordinary observer to find the planets.

M. M.

POSITION OF PLANETS FOR AUGUST, 1879.

Mercury.

Mercury should be looked for after sunset in the first half of August, setting earlier than Venus, and at a point of the horizon north of Venus.

On August 1 Mercury sets at 8h. 12m. P.M.; on the 15th at 7h. 10m. P.M., and on August 31 Mercury rises at 4h. 31m. A.M., and sets at 5h. 49m. P.M.

Mercury's motion is direct among the stars from August 1 to August 9; after August 9 it is retrograde.

Venus.

Venus and Mercury can be seen after sunset in the first half of August. Venus increases in brilliancy until August 19, when it is at its maximum.

Venus sets August 1 at 8h. 57m. P.M. On August 31 at 7h. 9m. P.M.

Venus is near the crescent moon on August 20.

Mars.

Nearly coincident with the setting of the smaller planets is the rising of the larger planets.

On August 1 Jupiter rises as Venus sets. Saturn follows Jupiter after about an hour and a half, and Mars, having moved away from Saturn toward the east, follows Saturn.

On August 1 Mars rises at 10h. 55m. P.M. On August 31 Mars rises at 9h. 38m. P.M.

The color of Mars makes it easy to find it, and it can be known by referring it to Jupiter and Saturn; it follows them in rising, but is much farther north.

Jupiter.

The brilliancy of Jupiter in the eastern skies will be as noticeable as that of Venus in the western.

On August 1 Jupiter rises at 8h. 42m. P.M. On August 31 Jupiter rises at 6h. 36m. P.M.

If we take the hour from 9 to 10 P.M. for observations of Jupiter, the most marked changes in the positions of the four moons of the planet will be on August 13.

At 9 P.M. Jupiter will be seen with only one moon, and that one the most distant. About 10 P.M., almost at the same minute, the largest and the smallest moon will come out from behind Jupiter, and another will leave the face of the planet, having been moving across the disk, so that three moons will seem to be clinging to the planet at the same time.

Saturn.

On August 1 Saturn rises at 10h. 6m. P.M. On August 31 Saturn rises at 8h. 6m. P.M.

We are now in such position relatively to Saturn that we see the ring more opened, and a small telescope will show the projection of the ring as handles extending beyond the ball of the planet.

Uranus.

Uranus will not be likely to be seen during August.

This planet rises on the 1st at 7h. 1m. A.M., and sets at 8h. 20m. P.M.

On the 31st Uranus rises at 5h. 12m. A.M., and sets at 6h. 28m. P.M.

Neptune.

On August 1 Neptune rises at 11h. 8m. P.M. On August 31 Neptune rises at 9h. 10m. P.M.

According to the Nautical Almanac Neptune is in conjunction with Mars August 14, at 3h. 31m. A.M., Washington time, Neptune being south of Mars 15m., or one half the diameter of the moon.

Occultation.

The beautiful star Antares, in the constellation of the Scorpion, will be occulted by the moon on August 24.

The American Nautical Almanac gives 10h. 35m. as the time when the star will disappear behind the moon, as seen at Washington.

An ordinary glass will show the phenomenon, and probably the companion stars of Antares may be seen.

An Aged Turtle.

About the middle of June, a turtle was taken in the St. John's River, Florida, with the Spanish coat of arms and the date 1700 engraved upon his back. There was also inscribed in Spanish the sentence: "Caught in 1700, by Hernando Gomez, in the St. Sebastian, and was carried to Matanzas by Indians; from there to the Great Wekiva." The "Great Wekiva" is the name by which the St. John's River was formerly known. The turtle was put back into the river with the added inscription: "Eastern Herald, Palatka, Florida, 1879."

The American Watch Tool Company, Waltham, Mass., sends us a sample of a screw having 375 threads to an inch, size at bottom of thread $\frac{1}{1000}$. They have just completed the lathe for such work.