

forth in instructions, dated July 1, 1858. By those instructions, I was directed "to proceed to Santa Fé, in New Mexico, *via* Independence, Missouri, and explore the valley of the Rio Grande as far below El Paso (in Texas) as the grape season would admit." On my arrival in the valley of the Rio Grande, I was to "take the requisite steps to procure cuttings preparatory to their removal," "noting the character of the fruit, the local names, their period of maturity, the nature of the soil," and any "information connected with the climate, which would have a bearing on the case." I was also required "to collect small quantities of grape seeds, and forward them to the office by mail." In case I "met with ripened seeds of any other valuable native wild fruits, forest trees, or shrubs, or any important vegetables, which could be conveniently collected," I was instructed "to put them up in a proper manner, and forward them to the Office." It was stipulated that this duty should be performed in a "period of nine or ten months, commencing the 1st day of July, 1858," and for which I was to receive a fixed compensation.

Having made the necessary preparation for the journey, I left Washington city on the 14th day of July, and proceeded directly to Independence, Missouri, arriving there in time to secure a passage in the mail train, which left on the 19th, for Santa Fé. The journey over the plains was accomplished without delay or accident, and I reached Santa Fé on the 8th of August. As the grape season did not, as I then learned, commence before the last of August, I did not think it necessary to proceed to El Paso by the mail stage which left for that place on the 11th of August, but remained there until the departure of the mail on the 25th, and reached El Paso on the 1st day of September.

In the market of Santa Fé I found excellent plums. They resembled the wild variety known in the southern States as the Chickasaw, though more sweet and delicious than southern plums. Apricots, also, were in season. In comparison to our improved sorts, they were small in size, but in richness of flavor are not surpassed. Seeds of these fruits were collected and sent to the Office. So far as I could learn, these fruits are grown in a natural way, the art of budding and ingrafting being unknown to the natives, or not practised. The trees are chance seedlings, or transplanted suckers, and thrive most when in proximity to the *acequias*, or irrigating canals, from which the roots derive a constant and regular supply of moisture. I saw no orchard in New Mexico, though with irrigation, apples, pears, and peaches could be successfully cultivated. I did not see any of those fruits which would be considered valuable where our varieties are known.

Descending the Rio Grande, the vineyards are first seen at Bernallilla. At Albuquerque, I learned that the grape was extensively cultivated. I was told that the fruit from cuttings procured in Paso del Norte was of inferior quality, but that another generation of vines produced grapes equal to those grown three hundred miles south. How far this is to be received as correct, I had no means of ascertaining, but, as it seems to favor the idea that the habituation of these grapes to a northern latitude is gradual and progressive, I deem the statement necessary, leaving future experiment to test the principle.

The grapes which I saw in Albuquerque were of such excellent quality that every inducement is held out to increased cultivation.

The vine is cultivated in many if not all the villages on the Rio Grande, though not so extensively as at Paso del Norte. The vineyards there are scattered through the town, wherever water can be procured for irrigation. They are generally small, inclosed by adobe walls, and resemble in appearance the inclosures devoted to the growth of culinary vegetables in the lesser towns of the United States. Great quantities of the fruit are exposed in the market places, and much is dried for winter use.

As yet there are but few vineyards in El Paso valley, on the eastern or Texas side of the river, but the market was abundantly supplied from the vineyards in Paso del Norte. There are but two varieties, the *white* and the *blue*, though some of the proprietors of the vineyards will say that there are *five or six classes*. Their distinctions, however, are founded merely on variations in color, caused by different exposures to light, and it not unfrequently happens that two or more classes are taken from the same vine.

The *white* grape was nearly out of season when I arrived at El Paso. The bunches are large, loose, and shouldered. The berries are about the size of the Catawba; they have scarcely any pulp, very sweet and juicy, with a slight and not unpleasant musky aroma, which is imparted to the wine. This is of a pale straw color, slightly acid. The vine is vigorous, but does not seem to be hardy.

The *blue* grape, which this year was in season from the 25th of August till the 15th of September, is more extensively cultivated in Paso del Norte. The bunches are large, loose, and branching, sometimes weighing three pounds; and as many as thirty bunches have been picked from a single vine. Such a yield is, however, unusual, though with better cultivation than is now given the product would be augmented. The berries are generally larger than the Catawba grapes of our vineyard, thin-skinned, very juicy, and exceedingly sweet. The vine is short-jointed, and a strong and vigorous grower. When in the vicinity of fruit-trees on which they can climb the vines will sometimes grow twenty feet in a season. Such vines are, however, not productive, and it is probable that if they were trained on frames they would not be so fruitful nor of such fine quality as cultivated by the present mode.

The vineyards of Paso del Norte are planted in rows, five or six feet apart each way. Most of the labor of the vineyard is performed with the hoe, while the ground is kept loose by frequent irrigations. If the ground were to receive stirring once or twice by the plow, it would certainly be attended by beneficial results. It would have a tendency to lessen irrigation, which, in my opinion, is overdone, and, as a consequence, the energies of the vine are expended in the production of wood. The vines are lopped off in a very careless manner, and a stump two or three feet high is formed. The bearing branches emerge from the buds near the top of the stump; these are annually cut back to three or four buds, every spring; but it is often done so late in the season that the flow of sap kills the spurs, and suckers are thrown out from the roots. Early in winter, the branches are drawn together and

bound; the earth is then heaped around the vines with a hoe, in which condition they remain till the following spring, when danger from frosts is supposed to be past, and the vines are headed back, and the earth leveled. It would no doubt be an improvement on the present system if the vines were pruned before the winter protection is given them, and the spurs covered with earth. Great injury is done by straining the vines and rupturing the sap-vessels in the operation of gathering up and pruning in the spring. The pruning should always be done with hand shears. An impression prevails among the vineyardists that pruning in early winter is prejudicial to the vines. Nothing can be more absurd; for the drying of the end of the vine where pruned off would prevent "bleeding" when the sap is in motion the following spring. From this notion being generally entertained, I had great difficulty in obtaining cuttings.

Major Emory, in his able "Report on the Mexican Boundary Survey," says:

"Southern California, the whole of the upper valley of the Gila, and the upper valley of the Del Norte, as far down as the Presidio del Norte, are eminently adapted to the cultivation of the grape. In no part of the world does this luscious fruit flourish with greater luxuriance than in these regions, when properly cultivated. Those versed in the cultivation of the vine represent that all the conditions of soil, humidity, and temperature, are united in these regions, to produce the grape in the greatest perfection. The soil, composed of the disintegrated matter of the older rocks and volcanic ashes, is light, porous, and rich. The frosts in winter are just sufficiently severe to destroy the insects without injuring the plant, and the rain seldom falls in the season when the plant is flowering, or when the fruit is coming into maturity and liable to rot from exposure to humidity. As a consequence of this condition of things, the fruit, when ripe, has a thin skin, scarcely any pulp, and is devoid of the musky taste usual with American grapes." (I differ with Major Emory, it will be seen, in regard to the musky aroma of the white or *muscatel* grape, as it is sometimes called. He doubtless refers to the *blue* grape, of which most of the El Paso wine is made.)

"The manufacture of wine from this grape is still in a crude state. Although wine has been made for upward of a century in El Paso, and is a very considerable article of commerce, no one of sufficient intelligence and capital to do justice to the magnificent fruit of the country has yet undertaken its manufacture. As at present made, there is no system followed, no ingenuity in mechanical contrivance practised, and none of those facilities exist which are usual and necessary in the manufacture of wine on a large scale; indeed, there seems to be no great desire beyond that of producing as much alcoholic matter as possible. The demand for strong alcoholic drinks has much increased with the advent of the Americans; and in proportion as this demand has increased, the wine has decreased in quality. On one occasion, I drank wine in El Paso which compared favorably with the richest burgundy. The production of this wine must have been purely accidental, for other wine made of the same grape and grown in the same year was scarcely fit to drink."

The process of making wine is quite primitive. The great scarcity of timber in that country compels a resort to various means to supply its place, and none is more likely to arrest attention than that which takes the place of the wine-press. An ox hide is formed into a pouch, which is attached to two pieces of timber and laid on two poles supported by forks planted in the ground-floor of the room in which the vintage takes place. The grapes are gathered in a very careless manner, and placed in the pouch until it is filled. They are then mashed by trampling with the feet. In this condition the mashed fruit, stems, and some leaves remain until fermentation takes place, which requires from fifteen to twenty days. An incision is made in the lower part of the pouch, through which the wine drips; it is transferred to barrels. The wine now has a flat, sourish taste. Should it be desired to make sweet wine, grape syrup, made by evaporating fresh juice, is added until the wine has the desired sweetness. It is not afterwards fined, or racked off, but remains in the cask until used. Perchance a few bottles may be filled and set away for particular occasions, but a very small quantity remains on hand six months after it is made. The scarcity of suitable casks, and the high price of bottles, may be a reason of so little old wine being in the country. I was told that the wine never underwent a second active fermentation. The room in which the wine is made and afterwards kept resembles a cellar, except that it is above ground, always dry, and an evenness of temperature preserved by thick *adobe* walls and a covering of earth.

For the last several years there has been a falling off in the product of the vineyards. The estimate is from two hundred and fifty to three hundred gallons to the acre, but with American skill in the management of the vineyards, and American appliances in making wine, the product might be more than doubled. The El Paso valley, on the Texas side of the Rio Grande, is about eighty miles long, and has an average width of seven or eight miles. This, in my opinion, is the Eden of the grape in the United States. The whole of this tract of country is adapted to vine culture. In some portions of California the same grapes which are cultivated on the Rio Grande may be produced in greater quantities to the acre, and the bunches and fruit may be larger; but it should be recollected that the grapes of California are cultivated with superior skill, and perhaps the soil of the vineyards in that State has not been so long under cultivation as that at Paso del Norte. Still, I think, in the quantity of grapes produced, and their qualities for wine, the El Paso valley will not, when it has a fair trial, be excelled by any district in California. As yet, lands in the valley are cheap; the town of San Elizario, the seat of justice of El Paso county, has a large body of land, which it will part with at a nominal price to actual settlers. The village of El Paso, near the upper end of the valley, has in a few years become a place of considerable trade. That point may now be said to be the key to the trade of Arizona and northern Chihuahua. It is the point where the two great overland mails have to pass, and is near the place which Nature has marked out as the most eligible for a railroad to the Pacific, to cross the Rio Grande.

The soil of the El Paso valley is an alluvial deposit, obviously de-

rived from the volcanic and older rocks of the mountain ranges. It is of a brownish color, absorbs water freely, and when duly saturated, is open and porous. The roots of vegetables penetrate it very easily. Beneath the surface there are thin beds, or strata, in which clay predominates. These beds contain a substance called "salitre," probably a mixture of alkaline matters. Salitre is often found on the surface, in thin efflorescence, especially in places from which water has subsided. The water of the Rio Grande, no doubt, holds it in solution, more especially after the rainy seasons, and as long as it is used for purposes of irrigation, the alkalies cannot be exhausted from the soil. The presence of the alkalies must, doubtless, be very energetic in supporting the luxuriant vegetation of the valley, as well as the principal means of continuing its wonderful fertility without apparent exhaustion. It may be proper in this place to remark, that the grape evinces a preference for the soils which are inclined to be sandy, and the most flourishing vineyards in Paso del Norte are those on the sites where the sand has been settled by the winds. The soil is admirably suited to the growth of corn, wheat, cotton, and tobacco; garden vegetables are raised in profusion.

The El Paso valley is remarkable for the production of various kinds of fruits. The apple, pear, quince, peach, almond, fig, pomegranate, and Persian walnut, also the apricot and plum, though not extensively cultivated, succeed well; but as the late improved sorts of our gardens and orchards have not reached that country, their fruits cannot be compared to ours. Exceptions can be made only of the grape, the fig, and the quince, which in quality are not excelled in the Atlantic States. Advantage is taken of the facilities for drying fruits, and immense quantities are thus preserved every year. In making *pasas*, or Mexican raisins, the largest and best bunches are taken from the vines when fully ripe and hung up in the houses. The grape gradually shrinks away until it becomes skin and seeds, with a small honied consistence surrounding the seeds. Fearing that a quantity of seeds which I had purchased might have their vitality injured by the dryness of the atmosphere before I could send them to Washington, and believing that the honied consistence round the seeds would serve as a protection, I purchased about fifty pounds of the dried grapes, and reported the fact to the Office. I regret that the letter approving my course, and directing a further purchase, did not reach me in time to comply with the order to the desired extent, but through the exertion of my obliging friend, Mr. Lightner, an American merchant residing in Paso del Norte, I obtained an additional *almo* and a half. Señor Don Joachin Sabo, of Paso del Norte, presented me with a gallon of seeds, and I also sent some of those I had purchased, and am gratified to learn that, with all, the success has been most complete, and the crop raised in the propagating gardens is worth a far greater sum than was expended in introducing them. Of the ultimate success of these grapes, especially in the southern States, I have not the least doubt, and I do not think experimenters should be discouraged if the first results do not equal their expectations. Dr. Lyons, of San Antonio, Texas, informed me that he had a vineyard of two hundred and fifty vines of the El Paso grapes, which would come into bearing next or the follow-

ing year. From his intelligence and skill, and the lively interest he takes in grape culture, the friends of "the cause" may look for most favorable results. The San Antonio river will afford water for irrigation, and the flourishing city of that name on its banks will furnish every convenience and facility for making and storing wine. The country round that city holds out inducements to grape culture, and the vine will no doubt succeed well on the Picos and other streams between that point and the Rio Grande, where water can be had for irrigation. On Devil's river I was told that wild grapes are found of such excellence that some persons maintain that they are indetical with the El Paso grapes, but that is a mistake, for those grapes are of European origin.

There was no frost last year until about the middle of November, and then so slight that the vines were not in a condition for cuttings to be taken off until the last of the month. From the objections before alluded to, I experienced much difficulty in procuring cuttings, and for those obtained I am indebted to the politeness of Señor Don Guadalupe Mirandi, Señor de Oranga, and Mr. Lightner. On the 10th of January I had the collection packed and ready for conveyance to Washington, but was detained till the 8th of February before a train passed down to San Antonio. We were thirty days making the journey to that place, a distance of six hundred and fifty miles. The collection reached New Orleans, and was sent on to Washington the 28th of March, 1859. The journey was accomplished without loss or injury to the collection, except that, in following my instructions to pack the collection in barrels made air-tight, I found one barrel of cuttings so much injured, on reaching New Orleans, that they had to be thrown away.

I did not explore the country below El Paso during the grape season, for the reason that the vine is cultivated to a limited extent east of the Rio Grande, and I should not have met with any native varieties until reaching Devil's river, by the mail, which then made but semi-monthly trips. That place is in an uninhabited part of the country, and in the midst of the Apache Indians. Such was then the condition of affairs on the border that the government established additional military posts, one of which is in the El Paso valley. I collected seeds of the piñon, or *Pinus edulis*, mezquit tree, tornillo, sapindus, seeds of several vegetables, and some superior wheat, cultivated by the Pimos Indians, which were forwarded by mail.