





1857

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C. Schuchard del.

TUBAC & THE SANTA RITA MTNS

From the S.E. Side.

L. H. Weston, Wallace & Co. Savannah, U.

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Possessions and Prospects of the Sonora Silber Mining Co.

REPORT

OF THE

Sonora Exploring and Mining Co.,

MADE TO

THE STOCKHOLDERS.

SEPTEMBER, 1857.

These returns, although not quite so large as you anticipated, nevertheless, exhibit Silver Ores of very great value.—*Report of Assay by Prof. Booth, U. S. Mint.*



CINCINNATI:
RAILROAD RECORD PRINT.
1857.

C

OFFICERS OF THE COMPANY.

CINCINNATI.

MAJOR S. P. HEINTZELMAN, U. S. A., PRESIDENT.

W. WRIGHTSON, SECRETARY.

EDGAR CONKLING, GENERAL AGENT.

GADSDEN PURCHASE.

COL. CHARLES D. POSTON, COMMANDANT AND MANAGING AGENT,
AT TUBAC.

HERMAN EHRENBURG, TOPOGRAPHICAL ENGINEER AND SURVEYOR
AT TUBAC.

FREDERICK BRUNCKOW, GEOLOGIST, MINERALOGIST AND MINING
ENGINEER, IN CHARGE OF CERRO COLORADO DISTRICT.

CHARLES SCHUCHARD, GEOLOGIST, MINERALOGIST AND MINING
ENGINEER IN CHARGE OF LA ARIBAC AND SMELTING HACIENDAS.

REPORT

OF THE

Sonora Exploring and Mining Co.

This Company was formed as a private association in March, 1856, at the instance of some gentlemen who had then spent several years in Northern Sonora and the Gadsden Purchase. The object proposed was the purchase and development of one or more of the old mining ranches, abandoned by the Mexicans in consequence of Indian difficulties and insufficient Government protection. In pursuit of this object, the Company sent Col. CHAS. D. POSTON, accompanied by a Mining Engineer of fourteen years experience in Germany, and a party of hardy frontiersmen, fully armed and equipped, to the Gadsden Purchase, with instructions to explore the deserted ranches and selecting the one which they should deem of greatest value, and most readily available, secure its purchase, and commence its development.

After several months of exploration, the Agent of the Company, on Dec. 31, 1856, concluded the purchase of the Arivaca Rancho, near Tubac, in New Mexico, and established the headquarters of the Company at the old Mining town of Tubac, on the Santa Cruz River, and near the Santa Rita Mountains, and the northern spurs of the Arizona, or Arazuma Range.

PERMANENT ORGANIZATION OF THE COMPANY.

On the acquisition of this purchase, according to the original Articles of Association, the officers of the Company proceeded to complete its final organization, under the laws of the State of Ohio, which provide for the creation and regulation of Incorporated Companies, and filed the following certificate of incorporation, on the 13th day of August, 1857.

CITY OF CINCINNATI, }
COUNTY OF HAMILTON, } ss.
STATE OF OHIO.

AUGUST 11th, 1857.

We, the undersigned, do certify that we are associated together, under the provisions of an act of the General Assembly of the State of Ohio, passed April 8, 1856, entitled an act, supplementary to the act, entitled an act to provide for the creation and regulation of Incorporated Companies in the State of Ohio, passed May 1, 1852, for the purpose of mining and smelting silver and other ores, and manufacturing bars and ingots of the same, and for such other lawful purposes as may be necessary for carrying out the above described objects; that the amount of our capital stock is Two Million Dollars, (\$2,000,000), divided into Twenty Thousand Shares, (20,000), of One Hundred Dollars (1\$100) each; that our office and principal place of business is in Cincinnati, Hamilton county, Ohio; that some part of the business is to be carried on in the portion of New Mexico, known as the Gadsden Purchase, and in other parts of North America, and that the name and style of the company is The Sonora Exploring and Mining Company.

Given under our hands and seals, the day and year first above written.

S. P. HEINTZELMAN, [SEAL.]
W. WRIGHTSON, [SEAL.]
JOHN KENNETT, [SEAL.]
E. C. MIDDLETON, [SEAL.]
SAMUEL FLICKINGER, [SEAL.]
GEO. MENDENHALL, [SEAL.]
JOHN R. WRIGHT, [SEAL.]

THE STATE OF OHIO, }
HAMILTON COUNTY. } ss.

Be it remembered, that, on this twelfth day of August, 1857, before me, a Justice of the Peace, for the Township of Cincinnati, County of Hamilton, and State of Ohio, personally appeared S. P. HEINTZELMAN, W. WRIGHTSON, JOHN KENNETT, E. C. MIDDLETON, SAMUEL FLICKINGER, GEO. MENDENHALL, and JOHN R. WRIGHT, who severally acknowledged the signing and sealing of the above certificate, to be their voluntary act and deed for the uses and purposes therein mentioned.

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal, at Cincinnati, on the day and year last above written.

W. CHIDSEY, [SEAL.]
Justice of the Peace.

THE STATE OF OHIO, }
HAMILTON COUNTY. } ss.

I, Thomas Spooner, Clerk of the Court of Common Pleas, in and for said County, do hereby certify, that W. Chidsey, before whom the foregoing acknowledgement appears to have been taken, was, at the time of taking the same, and now is, an acting Justice of the Peace, in and for Hamilton County, Ohio, duly commissioned and qualified, and that his signature thereto is genuine.

Witness my hand and the seal of said Court, at Cincinnati, this twelfth day of August, A. D., 1857.

++++++
+ L. S. +
++++++

THOMAS SPOONER,
Clerk of the Court of Common Pleas, Hamilton Co. O.,
By JNO. L. THOMPSON, Deputy.

SECRETARY OF STATE'S OFFICE,

Columbus, Ohio, August 13th, 1857.

I, James H. Baker, Secretary of State of the State of Ohio, do hereby certify, that the foregoing certificate of association is correctly copied from the original certificate, filed and remaining of record in this office.

Witness my official signature, and the Great Seal of the State of Ohio, at the time and place above written.

++++++
+ L. S. +
++++++

JAMES H. BAKER,
Secretary of State.

The Company is therefore now incorporated under the general laws of the State of Ohio, and possesses all the rights, privileges and immunities secured by these laws.

POSSESSIONS OF THE COMPANY.

The Arivaca Rancho, or as the Mexicans call it, La Aribac, is situated fifteen miles South of West from Tubac, and contains over *Seventeen Thousand* acres of agricultural land, with permanent water, wood and grass. It contains twenty-five Silver Mines, which were worked by the Mexicans previous to the Apache War, and which were famous for their yielding rich ores of silver, lead, and copper, and containing small quantities of gold. The most famous of these mines were Mina San José, Mina Santa Margarita, Mina Basura, Mina Blanca, Mina Arenias, Mina de Los Tajitos, La Mina de Amado, and La Purissima.

The report of the Engineer gives the following description of the agricultural resources of the Arivaca Ranche.

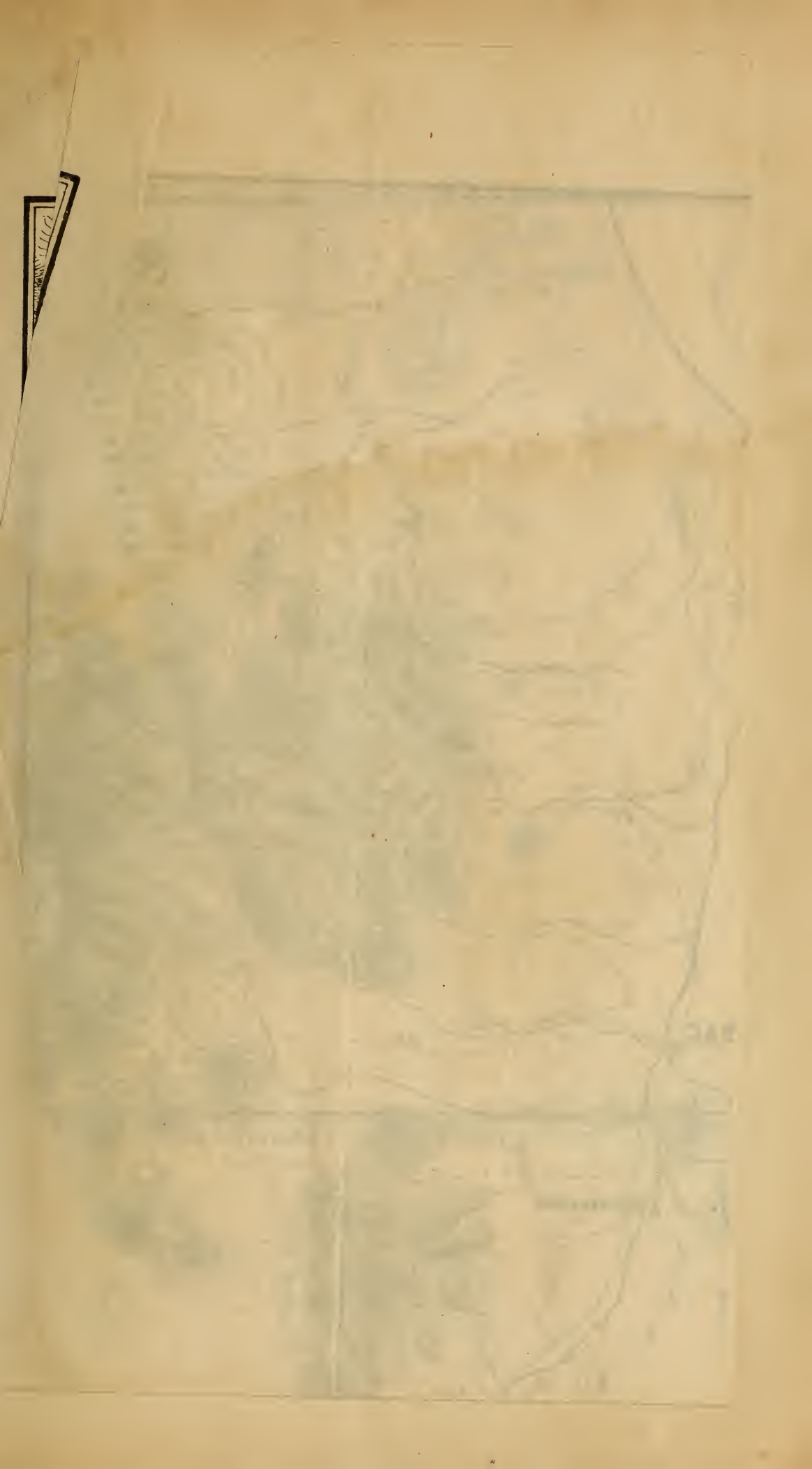
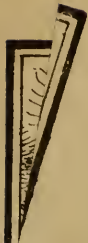
The Arivaca has much beautiful meadow land, fine pasture on the low surrounding hills for thousands of cattle; good oak grows in the gulches, mezquite on the hills, and on the lower ends of the streams, it is thickly lined, for five or six miles, with groves of cottonwood, ash, walnut, and other useful woods, for farming and mining purposes, in sufficient quantities to answer all the demands of the two districts.

The Company have also acquired title to *twenty-four* veins of silver ore in the Santa Rita Mountains, among which are the old mines of Salero, and Ojero. Seven miles to the North-East of the Arivaca Ranche, on the Cerro Colorado, the Company have opened *twenty-nine* veins of silver ore, among which are the Heintzelman Mine, Mina Carlos, Mina Maria, Mina Cesario, Mina Puertozito, Mina Guadalupe, Mina Amarillo, and Mina Longorenia. According to the report of the agent of the Company, dated August 5, 1857, the minerals of this mountain range, consist of silver ore, gold-bearing quartz, copper, lead, iron and coal. Water power is sufficient for all the machinery that will be needed. A wagon road from Tubac to the mines can be made and put in good order for \$500. On the San Coyetano Mountains, to the South-East of Tubac, the Company have also opened two veins of silver ore.

The Company have therefore possession of *eighty mines*, and nearly *twenty thousand* acres of land. These mines and lands will furnish occupation and subsistence to five thousand laborers, for an indefinite period of time.

TITLE TO LA ARIBAC.

The Sonora Exploring and Mining Company holds its title to this important Ranche, by purchase from Tomas and Ignacio Ortezt, in whose family there is a perfect chain of title as far back as 1802, when the corner-stones were placed by their father, Ignacio Ortezt. In 1833, the book of records shows that





By Herman Ehrenberg C. E.

Middleton, Wallace & Co. Lith. & Engrs.



Illustration, Wallace & Co. 1880

Mt Babuquivari

ARIBACA.

Mina Arenia

Mina Blanca

C. Schuchard des.

From the north west spurs of the Arizona mountains.

the Alcalde of Tubac ordered full possession to be delivered of said land on the 2nd of June. At that time an affidavit was also filed, signed by three competent persons, that the corner stones of said land stood where they had been placed in the year 1802, by the father of Tomas and Ignacio Ortezt. The boundaries to the land are as follows :

The North corner is on a high ridge of the South side of the mine known as the Tajito on a line of the mountain known as Buena Vista.

The corner to the South is on the low hill in front of the "Longorenia" mine, close to an Arroya full of trees.

The corner to the East is a little above the spring of water, on a Mezquite tree which has on it the sign of the cross, on a line of the mountain known as the Skull Mountain.

The corner to the West is at the point of water in a small hill in front of the Mountain Babaquivari.

Final Title granted by

Jose Maria Mendoza, General Land Commissioner of the State of Sonora, with the aforesaid boundaries and all their entrances, necessities, customs, services, timbers, mountains, pastures, waters, tenajas, watering place of the cattle or place for watering hides (alreviadores), and all other appurtenances.

Conditioned, that they should populate the place, and not abandon the same unless on account of the Apaches.

Dated, 2d July, 1833.

The company have caused the title papers to this Rancho to be examined by Hon. Thomas Corwin, and he has given his opinion that "the titles exhibited to him give the Company a perfect fee simple in both the soil and minerals of that property."

The recent decision of the Supreme Court of the United States in relation to the Mariposa Claim of Col. Fremont, confirms most emphatically the title of this Company to its possessions acquired in this purchase. Inasmuch as the Court has decided that the purchaser's title is good against all claims of persons ignorantly squatting on the land and erecting valuable buildings and works, it follows that the title of this Company as a purchaser of this Rancho, which is entirely free from squatters, is above all question and litigation.

VALUE OF THE ORES.

The ores of the mines already opened have been assayed by Prof. Booth, of the United States Mint at Philadelphia, Prof. Torrey, of United States Assay Office in New York, Prof. Locke, of Cincinnati, and E. Kinsey, Esq., a manufacturing Jeweller of Cincinnati, as well as by the Mining Engineers of the Company at Tubac. The following are the results of the assays as made :

Assay by Prof. Booth, of the U. S. Mint.

PHILADELPHIA, Aug. 19, 1857.

DEAR SIR :—Much to my regret, your address has been mislaid for the last two weeks, and has prevented my sending you the returns of analysis of the silver ores which you left with me for the purpose. The two specimens assayed were Nos. 4 and 10, which severally yielded,

	Per cent. of silver.	Grains in the lb.	Value of the lb. Av. dpoise.
No. 4.....	3.540.....	247.80.....	67 1-10 cts
" 10.....	1.252.....	87.64.....	23 $\frac{3}{4}$

These returns, although not quite so large as you anticipated, nevertheless exhibit silver ores of very great value. I have no doubt that by running them out with the lead ores of the same region, you will be able to extract all the silver from them, and even obtain a larger yield, if the lead ores should contain silver, as is usually the case.

Respectfully yours,
W. WRIGHTSON, Cincinnati, O.

JAS. C. BOOTH.

Assay by Prof. Torrey, U. S. Assay Office.

UNITED STATES ASSAY OFFICE, }
New York, Aug. 24, 1857. }

Examination of Silver Ore from the Gadsden Purchase.

Samples of this Ore were left with me for assay by Mr. Wrightson. They were pulverized and carefully mixed, so as to obtain an average of the whole.

Several assays of 2 $\frac{1}{2}$ ounces each were made, with the following results :

Silver in the proportion of 237 46-100 ounces to the ton of 2,000 lbs.; of the value of \$322.94.

The Copper constitutes 33 per cent. of the ore.

No gold was found.

JOHN TORREY, Assayer.

Assay by Prof. Locke.

CINCINNATI, May 18, 1857.

DEAR SIR:—I have examined the specimen of ore, and find it to contain copper, antimony, sulphur, silica, and 1.13 per cent. of silver,

Yours respectfully,

JOSEPH M. LOCKE.

To E. CONKLING, Esq., Gen. Agt. Sonora Ex. & M. Co.

Assay by E. Kinsey, Esq.

CINCINNATI, Aug. 25, 1857.

DEAR SIR:—Annexed we hand you result of analysis of two specimens of silver ore, from your Heintzelman Mine:

	Grains in the lb. Troy.	Per cent. of silver.	Value of the ore per lb. Troy,
No. 1	197.....	3.42.....	53 $\frac{1}{2}$
" 2.....	432.....	7.5	1.17

We also found traces of gold in each of the above specimens. The copper constitutes a large proportion of the ore.

Yours, respectfully,

EDWARD KINSEY,

Silversmith.

W. WRIGHTSON, Esq., Sec'y. Sonora Ex. and M. Co., Cincinnati, O.

[A pound Troy contains 5,760 grains; a pound Avoirdupois contains 7,000 grains. The assay of Mr. Kinsey will therefore yield, when reduced to the standard of Avoirdupois weight, as adopted in the other assays, as follows:

	Grains per lb. Av.	Value per lb. Av.	Val. per ton of 2,000 lbs. Av.
No. 1.....	239.40.....	\$0.64 83-100.....	\$1,296.60
No. 2.....	525.00.....	1.42 18-100.....	2,843.60]

The average of the whole may be seen in the following table:

	Grains per lb. Av.	Value per lb. Av.	Value per ton of 2,000 lbs. Avoirdup.
Assay by Prof. Booth.....	247.80.....	\$0.67	\$1,342.00
" " "	87.64.....	0.23 $\frac{3}{4}$	475.00
" " Prof. Torrey.....	51.99.....	0.16	322.94
" " " Locke.....	79.10.....	0.21 $\frac{1}{2}$	428.46
" " E. Kinsey.....	239.40.....	0.64.83...	1,296.60
" " "	525.00.....	1.42.18...	2,843.60
" " Mining Engineers at Tubac...	345.33.....	0.93 $\frac{1}{2}$..	1,870.40
" " " "	520.00.....	1.40 $\frac{3}{4}$..	2,816.60
Total 8 assays.....	2096.26	\$5.69.13	\$11,395.60
Average.....	262.03	0.71.14	1,424.45

The lead ores which will be used as fluxes in smelting the silver ores, yield of silver as follows, according to assays made at Tubac by the mining engineers.

	Grains per lb. average.	Value per lb. average.	Value per ton of 2000 lbs.
Longorenia Mine.....	18 11-48	\$0 04 93-100	\$98 60
Amarillo Mine.....	10 94-100	0 02 98-100	59 60
Arenia Mine.....	14 58-100	0 03 95-100	79 00
Average.....		\$0 03 95-100	\$79 06
Average of above silver ore.....			1,424 45
Average yield per ton of silver ore and flux.....			\$1,503 51

In addition to the above yield of silver, the ores of the company yield according to Professor Torrey, 33 per cent. of copper. In the report of Professor Dickerson on the mines of the Tennessee and Virginia Mining Company, three shipments of copper ores from the Cranberry Mine yielded as follows.

First Shipment.....	26.70 per cent.
Second "	29.00 "
Third "	23.60 "

This mine is worked entirely for the copper, and is found to be profitable. The yield per ton of the ores of the Sonora Exploring and Mining Company may therefore be very much increased by working for the copper as well as the silver. The ores of the Arivaca Rancho also yield gold according to the Reports of the Mining Engineer, and the assay of Mr. Kinsey.

PROGRESS OF THE WORK.

Up to the present time the company have been engaged in sinking shafts, cleaning out old mines, and preparing for the permanent business of mining, rather than in mining with reference to immediate results. They have cleaned out the



C. Schuchard des.

HEINTZELMAN MINE (NEAR ARIBAC)

From the South Side.

Middletown, Wallace & Co. Cincinnati, O

Salero Mine to the depth of eighty feet, and are now waiting for the arrival of force pumps to lighten the labor of the miners. They have opened the Heintzelman Mine to the depth of fifty feet, and commenced work in the galleries. There is now thrown out of this mine and ready for smelting, ore which will yield from twelve to twenty thousand dollars. They have sunk a second shaft near the Heintzelman, to the depth of thirty feet. They have cleaned out the Arenias Mine, and the miners are now getting out the silver bearing galena from this mine.

The Report of the Engineer, dated June 30th, says :

“ While at Arivaca we went down the Arenia Mine, situated about 500 yards from our hacienda. Mr. Schuchard has reached a depth of some forty feet, about. The vein bears Argentiferous Galena, and is stated to have a good deal of gold, as all the mineral deposits on Arivaca. I think the assay was between two and three mares per carga. Such yield is splendid even if it does not approach that of the Heintzelman, for the yield of the latter is extraordinary. The veins traverse a number of sharp outrunners from the mountains in the rear, which is highly advantageous, as it will permit us to work by level or drift, and have a large quantity of metal above us, and employ a good many hands at once. At the end of the little gallery started in the shaft, it looked brilliant, and I only wish I could transfer that glittering *fronton*, as the Mexicans call it, to your office in Cincinnati. It is excavated in the heaviest kind of ore shining like pure silver all around.

“ Wagons can roll up to the very mouth of the mine.”

The engineers have commenced building their smelting works at the Arivaca Rancho, and will soon be smelting the rich ores of the mines on that Rancho. These works are 500 yards distant from the Arenia Mine, and five miles distant from the Heintzelman Mine. They are conveniently located to wood, water and the mines. The assay furnaces at Tubac have been in operation for several months.

The company are also negotiating for the purchase of other valuable Ranches, with a reasonable prospect of a speedy and successful termination to the negotiations.

PROSPECT OF THE YIELD OF THE MINES.



SHARPENING MINING TOOLS IN THE MOUNTAINS.

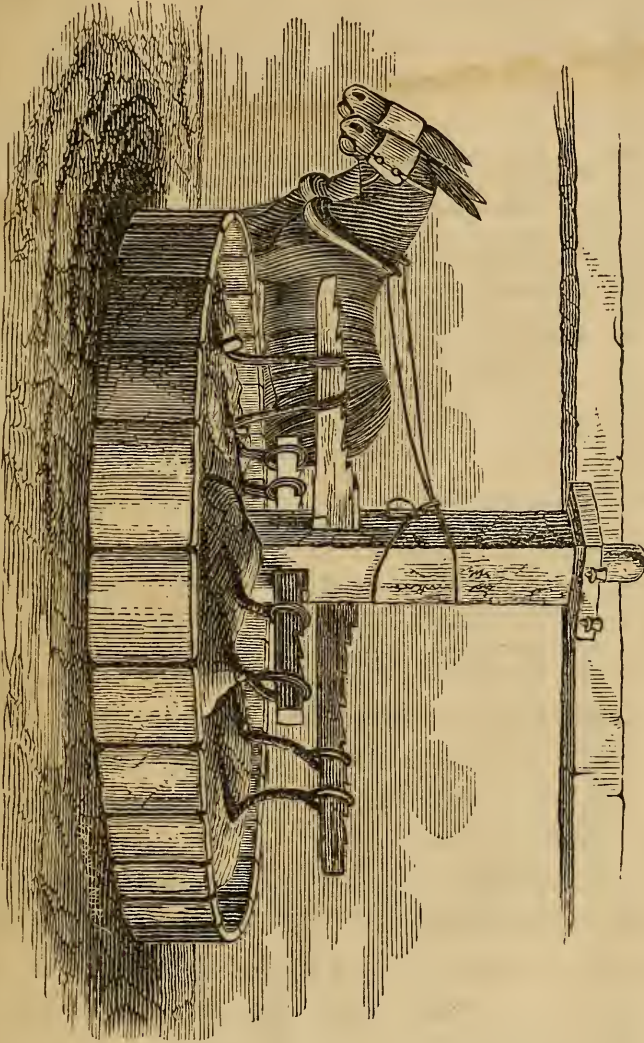
Mining like all other businesses, will pay in proportion to the skill, labor and energy which is employed in it. The mines of Mexico, which have yielded their owners the most immense fortunes, have been carried in many instances to the enormous depth of from 1000 to 2000 feet, and yet yielded returns ranging from \$100,000 to \$1,000,000 per annum, and in numerous instances even larger sums. They were worked with the rudest appliances, without skill or enterprise. The water was carried in raw hide sacks, on the backs of men, up ladders made of notched logs, from the bottom of the mines to their mouth. The ores were raised in the same tedious and la-

borious manner. The ores when raised were crushed in mills worked by mules, and consisting of heavy rocks fastened by hurdles to revolving arms of timber. The grain for food was prepared in an equally tedious and laborious manner.

And yet such was the enormous wealth of this country, that in 1803, Humboldt estimated the whole produce of the Mexican mines at \$1,767,952,000.

There can be no question then but that these mines afford a suitable field for American enterprise. And that the mechanical skill, experience and ability of our people, when devoted to the development of the mines of this company will be abun-

ORDINARY MEXICAN MILL FOR CRUSHING ORES.



dantly repaid. This will be the more evident from a comparison of the yield of the ores of these mines, and of those of Lower Mexico, and the quartz mines of California. According to Humboldt and Ward, the average yield of the mines of Mexico is $2\frac{1}{2}$ ounces of silver to the hundred weight of ore.

	Grains Silver to the lb. ore.	Value per pound.	Value per ton of 2000 lbs.
Average of Mexican mines.....	12.	\$0,03 $\frac{1}{4}$	\$65,00

The Steamer Bulletin published in San Francisco, August

5, 1857, gives the following average of the crushings of quartz from leads near Grass Valley, Nevada county, at Gold Hill Mill, during 1856.

Lead.	Tons.	Yield per ton.
Missouri Hill.....	72	\$40 00
do	33½	23 00
do	20	25 00
do	110	26 00
do	76	25 00
Sebastopol	27	111 00
do	33	60 00
do	29	80 00
do	21	30 00
Allison's Ranch.....	21	370 00
Houston Hill.....	22	60 00
Gold Hill	11¼	117 00
do	7½	117 00
do	226	23 00
do	7¾	63 00
do	7½	40 00
do	19	28 00
do	61	40 30
do	157	50 00
Osborne Hill.....	5	60 40
Ophir Hill	57	180 00
Massachusetts Hill.....	40	28 00
Rose Hill	120½	23 00
Redan Hill	39	26 00
Average 22 lots per ton.....		\$68,57
Or per lb.....		\$0,03 42-00

The same authority gives as the cost of raising the ore, transporting it to the mills and crushing and extracting about \$10 per ton, and states that ore yielding *twelve dollars* per ton can be worked with profit.

There is a vast difference of expense between mining, crushing, and amalgamating gold-bearing quartz, and mining and smelting silver ore, which will tell in favor of these mines.

The comparative value of the ores of these and the Mexican and California Mines may be stated thus:

Average of Mexican Silver Mines per ton.....	\$65 00
" " California Quartz Mines.....	68 57
" Silver per ton in Lead Mines of Son. Ex. & Min. Co....	79 96
" Silver per ton in Silver Mines of Son. Ex. & Min. Co.	1,424 45

It is therefore evident that the ores of this Company, which yield according to assay, an average of \$1,424 45 to the ton, afford an ample margin for profits under the most expensive system of working, and give promise of at least a fair return under skillful and economical management.

This Company is the pioneer in the important work of developing an extensive territory of our country, now lying worse than idle—a territory which cost our Government *Ten Millions* of dollars, and through which lies the great highway that must be adopted for our Pacific Railroad. The surveys of the Southern Pacific Railroad, now in progress of construction, lie directly through Tubac, the head quarters of this Company. When this great highway for the world is completed, as it will be, it needs no prophet to foretell the value of the property already acquired by the Company. But it is not merely in the completion of the Pacific Railroad that this Company looks for a safe and easy access to the waters of the Pacific. The mines are distant but 200 miles from the Colorado River and the Gulf of California. This distance is traversed by a safe and easy wagon road, which can be used at all seasons of the year. A project is already started and surveys made, for a railroad through the populous towns and villages of Sonora, to the port of Guaymas, which will afford a direct and early means of access by railroad to this section of country. The mines of the Company can be worked, as they have been opened, by the aid of Mexican labor, and be made profitable. The following estimate will show the prospects of yield from the Heintzelman mine alone. In California, a *ton* of quartz is an average *day's work* for a miner. To be safe in making our estimate, we will assume that in the mines of this Company, which are certainly no more difficult to work than the quartz mines of California, each miner will raise a *carga* (300 lbs.) of ore *per week*. The following will then be the result :

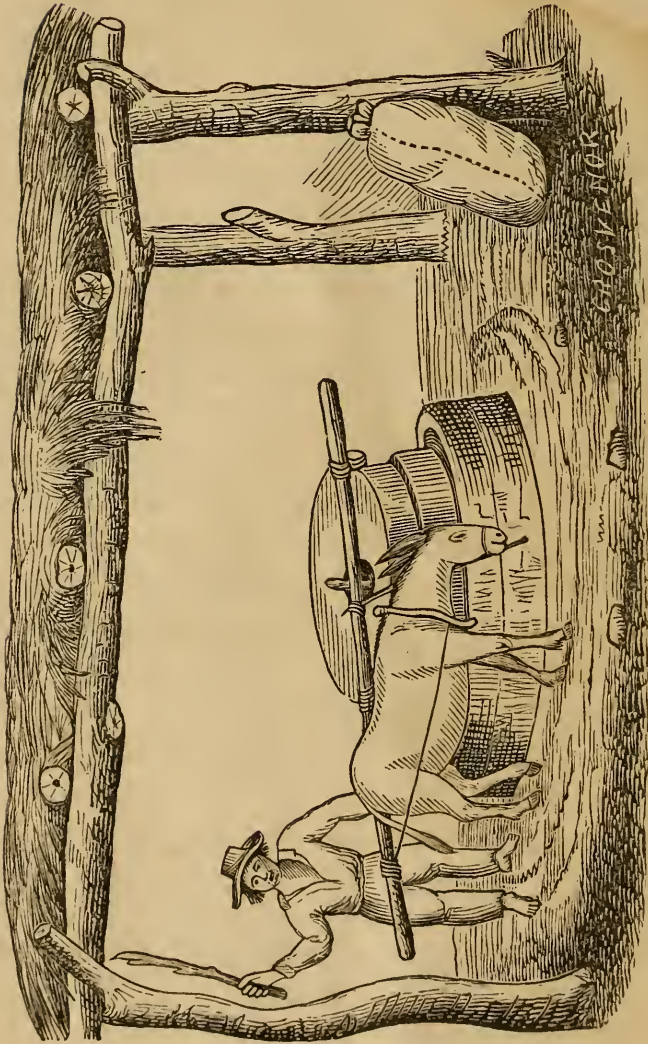
Each miner 300 lbs. $\text{\$}$ week, @ $\text{\$} 0\ 71\ 14\text{--}100\ \text{\$ lb}.....$	$\text{\$}213\ 42$
50 miners $\text{\$}$ week,.....	10,671 00
50 " " year, of 50 weeks,.....	554,892 00

That this estimate is not extravagant will be evident from the yield of the Mexican mines, with poorer ores, as given in the Appendix, composed of extracts from Ward's Mexico.

There is, therefore, a fair prospect that this Company will reap the reward of its enterprise in the development of its property, by the labor which is now at hand, and that the yield of its mines will increase as more intelligent labor is supplied.



PRIMITIVE FLOUR MILL AS USED BY THE MEXICANS.



MEXICAN IMPROVEMENT IN MILLS.—15 REVOLUTIONS PER HOUR.

APPENDIX.

FROM WARD'S MEXICO IN 1827.

The average annual produce of Sombrerete, from 1811 to 1825, is stated (though not upon the authority of registered returns) to have been 300,000, dollars, or about 200,000 less than the ordinary produce, from the time of the great Bonanza of the Fagoaga family, (when Eleven millions of dollars were raised in eight months, from the Mine of El Pavellon alone,) up to 1810.

The registered produce of the Mining Districts of San Louis Potosi, (the most important of which was Catorce) during a term of five years, before and after the Revolution (for which alone I have been able to procure Returns,) is stated in the annexed Table, (No. X.) by which it appears that there was a decrease in the latter period of 8261 Bars of Silver, (each of 134 marcs, or 1139 dollars,) which gives a total difference of 9,409,279 dollars on the five years after 1810.

The produce of the Mines of Catorce in ten years, (from 1816 to 1825 inclusive,) according to an extract from the Registers, which has been recently transmitted to me, was 5,994,006 dollars; which, if one half of this sum, (or 2,997,003 dollars) be added for the five years not included in the Returns in my possession, will give 8,991,009 dollars, as the Total, or 599,400 dollars as the average annual produce of that District, on the whole fifteen years. Before the Revolution, Catorce was second only to Guanajuato in the amount of the Silver raised, the value of which was estimated by Humboldt, (in 1803) at Three millions and a half of dollars annually.

The produce of the Biscaina Vein, at Real del Monte, in seven good years before the Revolution, (from 1794 to 1801,) was Six millions of dollars, or 857,042 dollars per annum. From 1809 to 1823, it only yielded 200,000 dollars in all or 14,285 dollars per annum.—*Vol. II, page 20.*

The Mines, in fifteen years, appear to have produced 153,276,972, (according to the Mint Returns,) or 165,000,000, if the Average, which I have taken, of Eleven millions annually, be correct; which, with the Seventy-two millions already in existence, give a Total of Two hundred and thirty-seven millions of dollars.—*Vol. II, page 27.*

The removal of the commercial restrictions, by which the progress of the Country had before been cramped, but which were much diminished in 1778 by the Decree of Free Trade, exercised so beneficial an influence throughout New Spain that the produce of the Mines increased, (in a term of ten years,) from 112,828,860 dollars, (which was the amount of Silver raised from 1760 to 1769,) to 193,504,554 dollars, which were yielded by the mines from 1780

to 1789, when the ameliorations introduced began to produce their full effect. From 1790 to 1799, still farther progress was made, the produce having amounted to 231,080,214 dollars.—*Vol. II, page 49.*

Captain Vetch, the Director of the Real del Monte Mining Association, in a Report dated the 26th September, 1826, after stating the produce of the mines of Count Regla, during the fifty years in which they were in full activity, to have been Twenty-six millions and a half of dollars, (Average 530,000 dollars per annum) calculates that, by working the two great veins, (La Biscaina and Santa Brigida,) at once, (which was never the case before,) the Company may expect to derive from them a yearly return of one million and a half of dollars:—He adds another million for the other mines belonging to the Company on the Veins of Moran, Acosta, San Estevan, &c., in the same district; and at Pechuga, Zimapan, and Ozumatlan; and declares his expectation, “that the mines, in the course of the year 1827, will cover their own expenses, and that, in 1828, the produce will be two millions of dollars; fully equalling, if not surpassing, the annual average amount derived from them before the year 1810.”—*Vol. II, page 100.*

The former produce of Catorce, during its best years was 2,854,000 dollars, (the average on five years, from 1800 to 1804).—*Vol. II, page 108.*

With regard to former produce, the mine of Arevalo, at Chico, is stated to have paid the King's tenth upon five millions of dollars, from 1804 to 1824; or to have averaged 250,000 dollars per annum.

The mines at Real de Arriba, in the district of Temascaltepec, produced, weekly, twelve bars, or 13,000 dollars, (yearly, about 600,000 dollars) Sta Rita, (at Zimapan,) upon the years 1791, 1792, and 1793, left a profit of 100,000 dollars.—*Vol. II, page 112.*

The first, (Santa Eulalia,) from its vicinity to the town of Chihuahua, was worked as early as 1705.

Its registered produce, from that time to 1737, was 55,959,750 dollars, or an average of 1,748,742 dollars per annum. From 1737 to 1791, it yielded something more than forty-four millions, making a total of one hundred millions of dollars during a period of eighty-six years.

The district was gradually abandoned during the last years of the last century, on account of the incursions of the savage Indian tribes; but in 1791, it possessed a population of 6,000 inhabitants, with seventy-three Haciendas for reducing metals, and one hundred and eighty smelting furnaces. All these are now in ruins, and the produce during the last thirty years, has been little or nothing; the whole receipts of the Provincial Treasury of Chihuahua having only amounted to 10,769,096 dollars from 1791 to 1825; but the possibility of restoring the mines to what they were, is, in the opinion of the natives undoubted.—*Vol. II, page 129.*

Mining in Mexico has, hitherto, been confined to a comparatively narrow circle: the immense mass of silver which the country has yielded since the Conquest, (Humboldt calculates it at 1,767,952,000 dollars, in 1803,) has proceeded from a few Central spots, in which the capital and activity of the first speculators found ample employment: yet, if we examine those spots, we shall find that three centuries of constant productiveness, have not been

sufficient to exhaust the principal mines originally worked in each, while by far the largest proportion of the greatest Veins remains unexplored.—*Vol. II, page 156.*

I annex a General Table of the total Coinage of all the Mints of Mexico, including that of the Capital, from the year 1733, when it was first placed under the direction of the Government, and returns of the annual coinage regularly kept.

By this it will appear, that the sum of 1,435,658,611 dollars has been *registered* as the produce of the mines of Mexico in ninety-three years, (from 1733 to June 1826.)

The work of Baron Humboldt enables me to add from Registers, which, but for his researches, would now have ceased to exist, (since not even the Mexican Government has been enabled to annex them to its official statements of the Mint Returns,) 272,514,825 dollars more, as the registered coinage of the Mint of Mexico from 1690 to 1733, with which year the present table commences.

This gives a produce of 1,708,173,436 dollars in a hundred and thirty-six years, proves both the constancy of the producing powers of the country, and the moderation of Baron Humboldt's calculations with regard to them, since he estimated the amount of silver raised from the Mines of Mexico in 1803, (from the Conquest 1521,) at 1,767,952,000 dollars, or 2,027,955,000 dollars, if one seventh were added to the Official Returns for unregistered silver.—*Vol. II, page 167.*

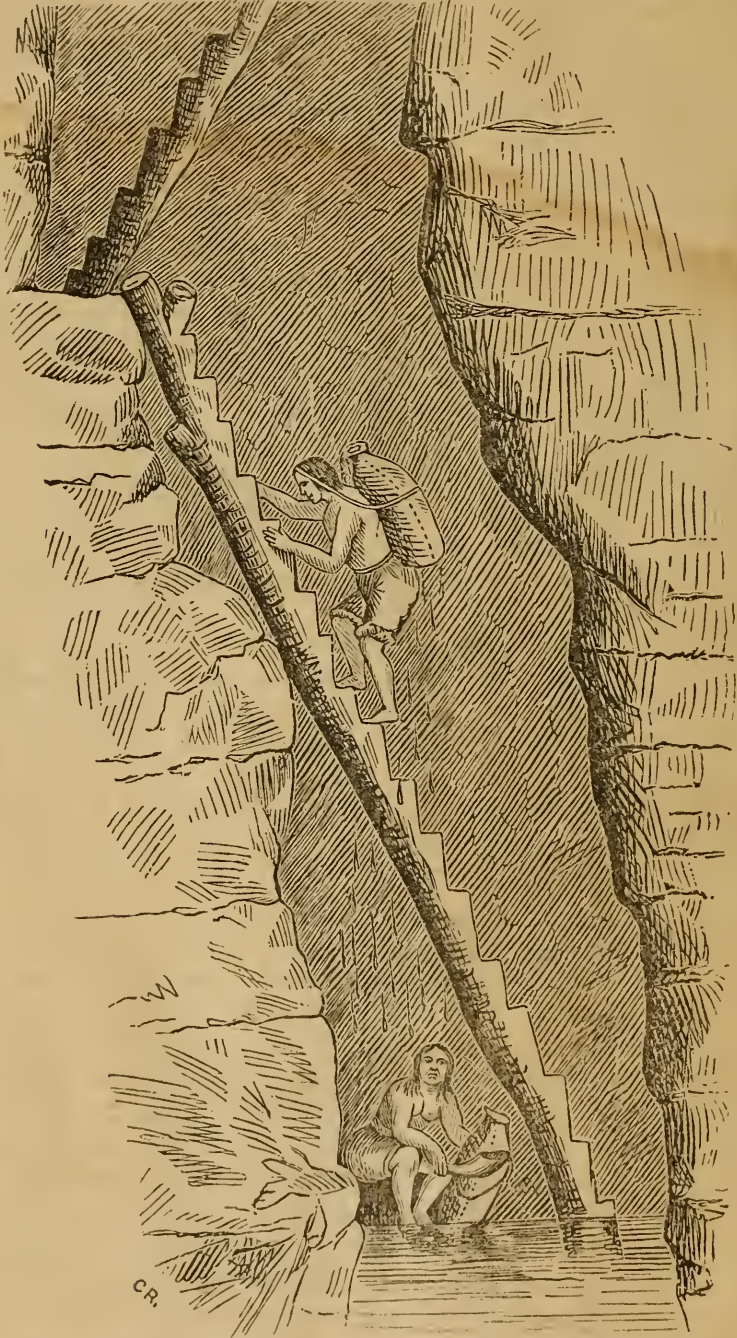
"It is in the immense mass of ores which they are capable of producing, and not by any means in the abundance of silver contained in them, that the richness of the Southern, or Central mining districts of Mexico, consist, Before the Revolution, it was calculated that the three millions of marcs of silver, to which the average annual produce of the country amounted, were extracted from ten millions of quintals (hundred weights) of ores; so that the proportion of silver did not exceed two and a half ounces to the hundred weight."—*Vol. II, p. 86.*

"That the great mineral treasures of Mexico commence exactly at the point where Humboldt rightly states the labors of the Spaniards to have terminated (about Lat. 24°), is a fact now universally admitted by the native miners, although hitherto but little known in Europe."—*Vol. II, p. 127.*

"The metals seem to increase in richness as you approach the North; inso-much that in the Real, or District of Jesus Maria, in that great branch of the Sierra Madre, which separates the States of Durango and Chihuahua, from those of Sonora and Sinaloa, to the North and West—the ores of the mine of Santa Juliana (which does not exceed seventy yards in depth) appear, by a certified Report from the Diputacion de Mineria, now before me, to average seven and eight marcs of silver per carga, of 300 lbs., which is the average produce of ten cargass of good ore in Guanajuato; while ores of the best quality yield as much as from four to ten marcs per aroba, of 25 lbs., or forty marcs per carga."—*Vol. II, p. 227.*

"But it is upon record at Durango, that Zambrano, who was the proprietor of all the principal mines of Guarisamey and San Dimas, paid, as the king's

fifth, upon the silver raised from the mines, between the period of their discovery, (in 1783) and 1807, when he died, eleven millions of dollars. These immense riches were derived principally from five great mines, La Candelaria (at San Dimas) San Juan Nepomuceno, Cinco Senores, La Abra, and



Tapia; of one of which (La Candelaria) I possess the regular returns for five years, which prove the annual profits never to have been less than \$124,000, while in some years they amounted to \$223,082. The ores of the mines

during the whole of this period, appear to have produced from five to six marcs per carga (of 300 lbs.) and often to have yielded twenty, and even thirty marcs. Indeed, nothing of a quality inferior to the first could have covered the expense of extraction; as, when the Candelaria had attained its greatest depth, 300 Varas, (800 feet) the water was still brought up from the bottom of the mine in leathern buckets upon men's shoulders."— *Vol. 11, p. 130.*

"An examination into the sources of the wealth of the principal families of the Mexican nobility, will confirm what I have stated with regard to the towns, by leading us nearly to the same result. The family of Regla, which now possesses landed property to an immense extent in various parts of the country, purchased the whole of it with the proceeds of the mines of Real del Monte. The Fagoagas owe their present importance to the great Bonanza of the Pavellon at Sombrerete. The estates of the family of Vibanco proceeded from the mines of Bolanos. The houses of Valenciana, Ruhl, Perez, Galvez, and Otero, are all indebted for their possessions to the mines of Valenciana and Villalpando, at Guanajuato. The family of Sardenata (Los Marqueses de Rayas) takes its rise from the mine of that name. Cata and Mellado gave to their first proprietor (Don Francisco Matias de Busto) the Marquisate of San Clemente, with immense wealth, a part of which has been transmitted to his descendants. The Canada of Laborde, at Tlalpujahuá, with the mines of Quebradilla and San Acasio, at Zacatecas, all contributed towards the three fortunes of Laborde. The family of the Obregones owes its beautiful estates (near Leon) to the mines of La Purissima and Concepcion at Catorce; as does the family of Gordoá, the estate of Malpasso to the mine of La Luz. The son of Zambrano (the discoverer of Guarisamey,) wasted as his rightful property has been, is still in possession of four of the largest estates in Durango; and Batopilas gave to the Marquis of Bustamente both the means of purchasing his title, for which he paid by a loan of \$300,000 (60,000*l.*), to the Royal Treasury, during the Revolution, and the affluence which he is now enjoying in the Peninsula."— *Vol. 11, p. 151.*

"The great German mine of Arevala stands upon another little hill, nearly opposite the town.

"It enjoyed no sort of celebrity until the beginning of this century, when it fell into the hands of the present proprietor, Don Antonio Revilla, who, after working it for some time in an obscure way, was fortunate enough, in 1803, to fall in with a Bonanza, or mass of rich ore, which enabled him to carry on his operations upon a larger scale. In 1811, from one part of the level, called 'El Divino Pastor,' he obtained, in seven weeks, a clear profit of \$200,000."— *Vol. 11, p. 345.*

"The Biscaina vein had been worked, almost uninterruptedly, from the middle of the sixteenth to the beginning of the eighteenth century, when the two principal mines (El Xacal and La Biscaina,) which, in 1726, had produced 542,700, marcs of silver (4,341,600 dollars,) were abandoned by their proprietors in consequence of the difficulty of keeping down the water with the very imperfect machinery employed in those early days. The mines were then only one hundred and twenty varas in depth, and the known richness of the ores in the lower levels induced an enterprising individual, Don Jose Alexan-

dro Bustamente, to denounce them anew, and to attempt the drainage by the Adit of Moran, a part only of which he lived to complete. On his death-bed he bequeathed his hopes and his works, to Don Pedro Tereros, a small capitalist, who had supplied him with funds to continue his operations, and who, sharing in all Bustamente's anticipations of success, immediately removed to Real Del Monte, and devoted his whole remaining fortune to the prosecution of the enterprise. From the smallness of the capital invested, the work advanced but slowly, and was not completed until the year 1762; but in the twelve succeeding years, Tereros drew from his mines a clear profit of 6,000,000 of dollars, or about 1,200,000*l.* sterling. He obtained the title of Count by the munificence of his donations to the Court of Madrid; and never was title more dearly bought; for he presented Charles the III. with two ships of the line (one of 112 guns,) constructed at the Havana, of the most costly materials, entirely at his own expense, and accommodated him besides with a loan of one million of dollars, no part of which has yet been repaid. He likewise built the two great Haciendas of San Antonio and Regla, which cannot, together, have cost less than 1,200,000 dollars (240,000*l.*); and he purchased landed property to such an extent, that even in the present depressed state of agricultural interests of Mexico, the revenue of the present Count exceeds one hundred thousand dollars; and ought, in more favorable times, to amount to nearly two, (40,000*l.*)—*Vol.* 11, *p.* 362.

"It was discovered in the spring of 1826, by two brothers (Indians) by name Arauca, to one of whom a little maize for tortillas had been refused upon credit the night before. In two months they extracted from their mine \$270,000; yet in december 1826, they were still living in a wretched hovel close to the source of their wealth, bare-headed and bare-legged, with upwards of 40,000*l.* sterling in silver locked up in their hut."—*Vol.* 11, *p.* 579.

"I am aware that many of the statements contained in this, and the preceding books, respecting the mineral riches of the North of New Spain, will be thought exaggerated. They are not so; they will be confirmed by every future report; and, in a few years, the public, familiarised with facts, which are only questioned because they are new, will wonder at its present incredulity, and regret the loss of advantages which may not always be within its reach."—*Vol.* 11, *p.* 600.

"Of this, Catorce, 24° Latitude, furnished a memorable instance in the year 1773. It is impossible to conceive a more bleak and desolate spot than that upon which these famous mines are situated—the very summit of a mountain ridge, inaccessible, even at the present day, to anything but mules, without provisions or water, or resources of any kind; yet, in three years after the discovery, it had a population of five thousand souls, and the town now contains sixteen thousand inhabitants. The fame of its riches brought crowds of settlers from Guanajuato, Zacatecas, and Sombrerete; and notwithstanding all the local disadvantages which I have enumerated, these settlers have remained. But the mines of Catorce possess all the properties which characterize those of the North; they all began to be productive almost at the surface, and all yielded ores of a quality unknown in the neighboring districts of Zacatecas and Guanajuato.

"The metalliferous dust of the famous mine of 'Zavala,' which produced four millions of dollars in two years, was eagerly bought up, at the mouth of the mines, by Rescatadores (proprietors of Amalgamation works,) who came from Pinos, and even from Guanajuato (distance of fifty and eighty leagues) for the purpose, at the price of one dollar for the pound of ore (three hundred dollars per carga.)

"The owner of the mines of Santa Ana and San Geronimo (Capt. Zuniga,) after living upon their produce during his whole life, bequeathed, by his will (of which I have an authentic copy,) four millions of dollars, the greatest proportion of which was left to pious institutions. The mine of La Luz, which was denounced in 1804, and is still in full work, has given to its present proprietor, the Licenciado Gardoa, the estate of Mal Passo, near Zacatecas, for which he paid 700,000 dollars, and a million of dollars capital: the best ores, during this time, have sold, according to the Registers of the mine, at 340 and 380 dollars per carga, of 300 lbs.

"The ores of a particular level of the mine of La Purissima, which belongs to the family of the Obregons (*el ojo del cielo*) sold for 600, 400, and 380 dollars per carga: at which price they were bought as late as 1817.—*Vol. 11, p.132.*

"A similar enterprise will shortly be attempted in England, by an English gentleman (Col. Bourne,) who has been long a resident in Mexico, in conjunction with Mr. Escalante, the representative of the State of Sonora in the Senate.

"They have taken up contracts for the mine of Arizpe about 30° north Latitude,) in a situation possessing great local advantages, a fertile country, the vicinity of two large rivers, and a communication by water with the Pacific. The mines themselves were formerly celebrated for their riches, and the capital required to bring them again into activity is very small.

"The specimens which I have seen of the ores extracted from them, almost induce one to adopt the theory, that the proportion of silver contained in the ores increases as you advance towards the North; a theory which is very generally believed, at present, in Mexico, and which is certainly confirmed by the superiority of all the Northern ores to those of the richest districts in the South.

"The idea probably originated in the discovery of the famous Bolas de Plata (Balls of Silver) of Arizona, in the beginning of the last century, which was, and probably still is, believed in Europe to be one of those fables, with which mining countries always abound.

"But the attention of the present government of Mexico having been drawn to the subject, a search was made in the Vice-regal Archives, by order of the President, for the correspondence, which was known to have taken place respecting it in the year 1736.

"This correspondence I have seen, and I have in my possession a certified copy of a Decree of Philip the Fifth, dated Aranjuez, 28th May, 1741, the object of which was to terminate a prosecution, instituted by the Royal Fiscal, against the discoverers of Arizona, for having defrauded the treasury of the duties payable upon the masses of pure silver found there.

"The Decree states the weight of the balls, sheets, and other pieces of silver discovered (*bolas, planchas, y otras, piezas de plata*) to have amounted to 165 arrobas, 8 lbs., in all (4033 lbs.;) and mentions particularly one mass of pure silver, which weighed 108 arrobas (2700 lbs.;) and another of eleven arrobas, upon which duties had been actually paid by one Don Domingo Asmendi, and which, as a great natural curiosity (*como cosa especial,*) the king states ought to have been sent to Madrid.

"The Decree ends by declaring the district of Arizona to be Royal property, as a '*Criadero de Plata*;' (a place in which, by some natural process, silver, was created;) an idea to which the flexibility of the metal, when first extracted, seemed, in those times, to give some color of probability; and by directing it to be worked upon the Royal account. This put a stop to the enterprises of individuals: the district was deserted; an attempt to send a sort of colony there failed; and, in a few years, the very name of Arizona was forgotten."—*Vol. 11, p. 136.*





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